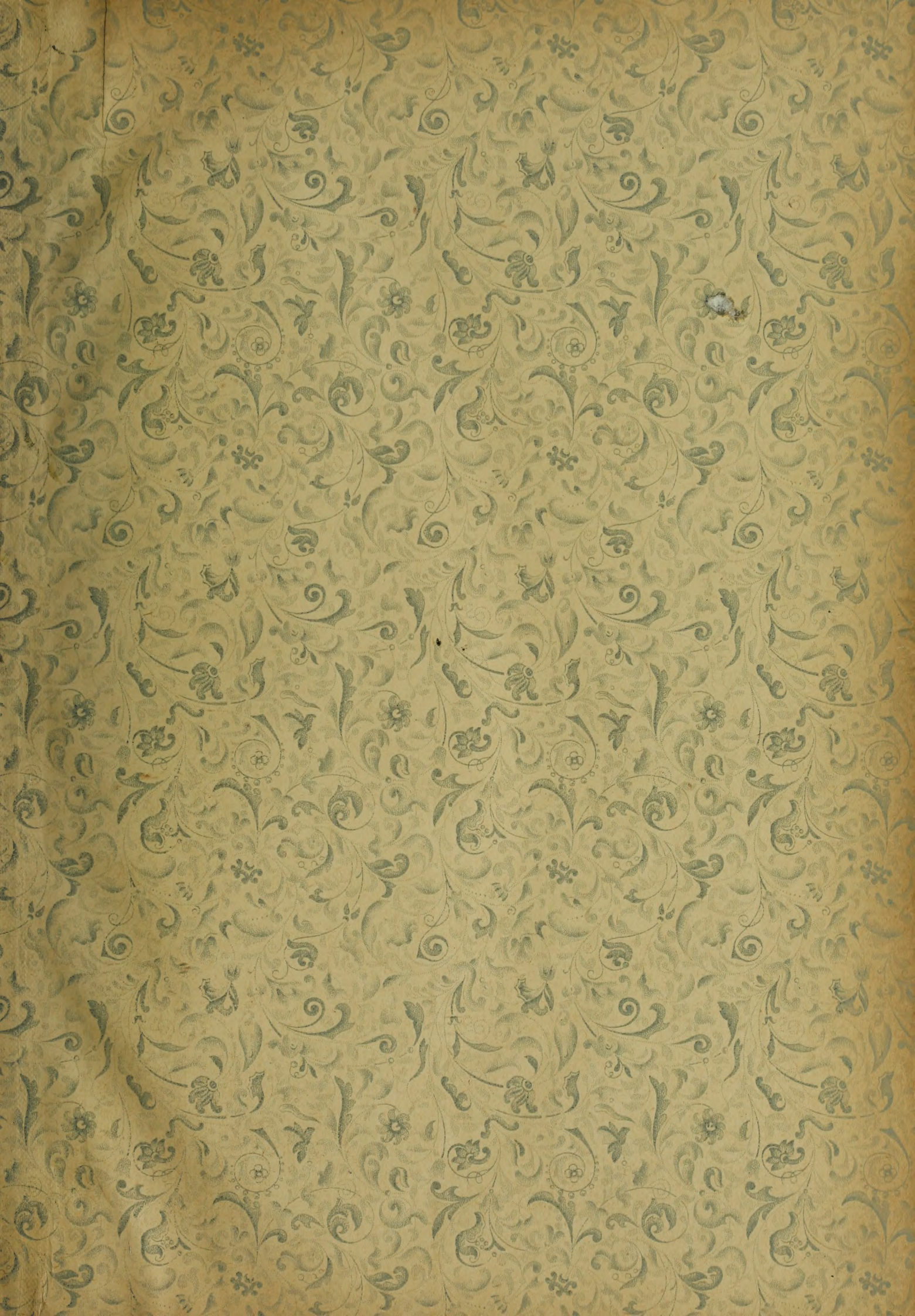




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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

### NEW DEPARTURES IN ARCHITECTURE.

WE live in an epoch making age, when in nearly every department of industry new departures are being witnessed. The progress in the several branches of architectural construction has been great. At one time we had simply to chronicle new inventions and materials; now it is rather the description of new methods, the application of scientific research and artistic principles to new kinds of building and architecture. It is not so much what has been discovered as how it is applied, that is the main question. The practice of the profession is now wide and varied; it has all sorts of public wants to satisfy, buildings intended for uses which were unknown to our forefathers, modes of construction in which iron and steel largely enter, besides a variety of substitutes for fireproofing and decoration. All this has entailed a large amount of professional labour, and has to some extent retarded art.

The assertion of the scientific and technical spirit in building construction has become more and more pronounced, with it must be feared, a corresponding loss of artistic ideals. Architects are just now overburdened with the details of their professional duties. Owing to the rapid strides made in scientific discovery, the development of scientific methods, the competition amongst the building trades, and other causes, they are unconsciously losing something of those imaginative qualities which stirred the great masters of Mediævalism and the Renaissance. The same temper seems to have caught the followers of architecture across the Atlantic. A writer in an American architectural paper speaks of the value of a little literary dissipation. The architects in America, as elsewhere, have been suffering of late years very much from what has been aptly called "scientific indigestion," a condition of a large class of mental dyspeptics, who, we are told, have been "turned out under the cram principle of modern-system examinations." They have been crammed with all sorts of analyses and theories, which appear to have impaired their digestion of architectural principles. Take, for example, those which are apparent in the best of old work. We see honesty of construction and simplicity. There is no desire to disguise methods of construction in different materials, or to devise complex modes and details. Yet it is impossible to study modern treatises of construction without being led to suppress all such ideas. Nothing but mathematical analysis and precision, modes of jointing, minute descriptions of how to get the maximum of strength with the least material, are insisted on. These injunctions rather tend to produce good theorists and expert me-

chanicians than artistic craftsmen. The examples given, too, are hypothetical, not every day's experience. And it is the same with plan, matters of proportion, the profiling of mouldings. If it is the strength of a pine-post, all that is taught in the school is the ratio of height to diameter that will resist a certain load, or the kind of base and capital; nothing is taught as to what sort of mouldings a baluster should have or how they should be arranged to produce the idea of strength or repose. On questions like those of resistance to flexure, it is the theory of resistance to certain forces above and below a neutral axis that is discussed, not an inkling of the satisfaction the eye and mind experience in designing lintels or beams of iron, or stone, or wood. These are indeed perceptions which cannot be mathematically analysed, although they appeal to every artist.

Experimental research in matters of building has rather helped to rectify the theoretical basis of much of our knowledge. The architect or engineer goes now to experimental data to guide him; he is more likely to accept the results of men who have been trained in the laboratories and technical schools of Europe than to adopt theories and formulæ which do not represent actual facts. The great interest of late awakened in experimental tests of ordinary building materials, like brick and terracotta, iron, stone, and wood, lead to the conclusion that a new epoch is awaiting the architect and engineer, when these experiments and results will be undertaken by men in whom the facts of building construction and the making of theories and formulæ are united. There will then be no more of those awkward conflicts between theory and practice which are the consequence of one class of men being engaged in making formulæ and an entirely different class relied upon for facts. Before an architect specifies any brick pier to carry a given load, he will be assured by official tests what a given-sized pier will sustain without failure; he will be able to rely on his tables or formulæ for every column or girder of iron or wood he uses without the vague fear that there may be something wrong in the figures given, and that a large factor of safety is necessary.

Do not these disturbing and disquieting discussions about the foundation of many of the modern theories give us renewed faith in the unchanging principles of architecture—that we may after all be led to a surer basis than we have possessed? We may be sure of one thing—that these changes in the shifting of our bases will not affect the architect who is true to his art. They may, indeed, tend to broaden some of his views, no less than

to strengthen his convictions. The more rational use of iron and other modern materials may suggest a more reasonable way of adopting them than we have seen, and we may even look for the beginning of a new system of iron construction. At the same time, the development of scientific enterprise must help to formulate and define what has been more or less hazy and beyond our grasp. In this connection we may mention the brickwork tests conducted by a committee of the Institute, two series of experiments having been made, the results of which we have given, various cement tests, experiments on iron and steel columns, various fireproof tests made under the direction of the Tariff Association and the Architectural League of New York, from all of which useful results have been derived.

One of the departures which has been witnessed is the attempt to substitute technical training for apprenticeship. We do not for a moment undervalue the advantages to be derived from the establishment of technical schools and workshops; they supply the craftsman and the student of architecture with methods and knowledge that cannot be learned at the office; but we still believe that the system of apprenticeship, by bringing the pupil in touch with the actual practice and routine of the professional life, is invaluable. All our greatest architects have been articleed to professional men. No other kind of instruction in classroom or workshop can teach the pupil how buildings are designed and carried out. Office training has its deficiencies, which, of course, must be supplied by the pupil's own application, by reading and study, and here the technical training in schools comes into requisition. But there is the danger of making technical teaching a substitute for the office discipline, of relying upon it too much. We throw out the hint that the course of instruction in these schools ought not to supersede or overlap that given in the architect's office. To give exercises in working "samplers," to set before the pupil imaginary conditions and problems, or to make designs for buildings on paper, is very far from teaching him the actual requirements of the architect's business.

In many practical matters of varying degrees of interest for architects considerable progress has been made. For instance, a great deal may be said about the awakening of the profession to certain applications of science and industries to architecture. One "epoch-making" feature of the time is, if we may so describe it, the artistic assimilation of modern conveniences and appliances. Not so long ago it was a hard thing to bring "into line" or harmony with architectural design any new or mechanical invention. Anything made of iron was hard and crude;



even the circular iron staircase and the lift were intractable features. The iron casement and sash were abominable innovations; even a patented window-opening contrivance was regarded with something like horror on the part of the "art-architect"; "pious execrations" fell on the head of any inventor who had the audacity to introduce any material or thing which was not to be found in the traditional specification. The fireproof floor, the ceramic craze, the new ventilator, the electric light had all to fight their way into the architect's favour. One by one they have succeeded in dispelling his prejudices, and we now see them accepted as absolutely necessary to a modern building. In this movement, of course, there was a national "Philistinism" to conquer and overcome, which is still strong; but the opposition is gradually being removed. If we take any of our recently-built blocks for the upper and middle classes, or any of our great hotels that have lately been erected, we shall see that what was before very tentatively introduced and ill combined with the architect's work is now handled and appropriated with a sense of artistic assimilation. Iridesome practical facts and details are beginning to assume their right positions, and fall into their true places. A new artistic spirit is beginning to permeate our inventors and manufacturing firms. The mechanical ingenuity which is expended in the production of a new plastic material, a fireproof floor, or lift, is directed to a more definite end, and we now see these features taking their place almost naturally in the scheme of the architect's design. We do not say there is nothing more to be done. Far from it. Even in such things as electric-light fittings, window and door fastenings, embossed decorative materials, there is still a great deal that is crude and intractable. It is too much taken for granted that the architect must give way to these modern necessities, or, rather, that his art must be made to conform to them. It is almost worse with patent decorative materials, like those used to imitate ornamental plaster ceilings or wall relief, which are applied without any architectural reserve or adaptation whatever. In these matters the advice of an eminent architect may be quoted, in speaking of material, that "the design must express natural properties so clearly that it would lose its charm if translated into a different material; it becomes bad art if it is unsuitable to the material employed." On this point we have much yet to learn.

#### ADAPTABLE SPECIFICATIONS.—XXIV.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued).

ALTHOUGH specifications by custom are divided into successive sections which refer to separate "trades," everyone knows that in actual building several "trades" are pretty sure to be going on at the same time. The architect cannot superintend the bricklayer, and get done with him, before he begins to look after the mason; nor can he finally dispose of the mason before the carpenter comes on the scene. Superintendence, in fact, is largely concerned in fitting the different "trades" together bit by bit, and thus a chapter on it naturally goes backwards and forwards, and mixes up different sorts of work together, just as they mix themselves up during the erection of the building.

It may be assumed that we have reached the point at which bricks are beginning to be delivered on the site, if our structure is to be mainly a brick one. But here the architect may by possibility have to observe, not only what the bricks are, but where they are being stacked. He may be concerned, for instance, with a house which is being erected in grounds already laid out and planted. When this happens there is very often a tendency to do a great deal of careless, and even of wanton, mischief to gardens,

orchards, and fences. For this mischief the owner will find it difficult to obtain compensation, and no compensation can make up to him for the years that may be occupied in growing fresh trees to replace those that have been needlessly destroyed. Some men seem to take a positive delight in laying waste the sites they are building on. They break down the fruit-trees with bricks or brick rubbish; they run ladders and scaffold poles through the fences and gates, and drop slates through the glass of the green-houses. Even the painter, who might seem a most inoffensive workman, has been known to scatter his colours from end to end of a garden, and to poison the sod in patches with copper and arsenic and chromate of lead, or to saturate it with the petroleum products which he passes off for turpentine. Wherever possible, the builder and his men should be rigorously excluded from every yard of ground which it is not intended they should desolate. Then again, for sanitary reasons, the walls of the premises, both inside and out, should be protected from use as casual or temporary latrines. Proper offices should be fitted up, in a suitable place, so that there can be no excuse for nuisances in or near apartments which are to be inhabited. For the same reasons, road-sand, unless thoroughly well washed, should never be allowed in mortar and plastering. From the nitrates it contains, it is unfit to be employed in a human habitation, and being full of deliquescent salts, it is a cause of dampness in walls, and of ruin to wall-papers and decorations.

As soon as the bricklayer sets to work two grounds for complaint are very likely to appear. One relates to the use of dry bricks. The specification states that they are to be well wetted. The bricklayer's way of wetting them is by squirting a few pints of water from a hose over the top of a stack containing several thousand bricks. If he is a very careful man, he may repeat this process after every five or six layers have been removed. What he really does, is to damp one face, and one face only, of the topmost layer, leaving all the layers below it dust-dry. Nobody knows this better than the bricklayer himself; but long practice enables him to go through the performance with a grave face, and even to assure the architect that "the bricks have all been thoroughly well wetted." The truth of the matter is, that wet bricks are unpleasant to work with, and are liable to make the hands sore. But there is no reason why the bricklayer, or the mason either, should lift his materials with his bare hands. Workmen of these classes in the Middle Ages seem to have worked in gloves, and gloves are cheaper and better now than they were then. The use of indiarubber gloves is compulsory on men who are laying or altering electric mains, and their duties require incomparably more nicety than those of the ordinary waller. The other question as to which the architect may probably find himself in opposition to the bricklayer relates to the flushing-up of vertical joints. Year by year this has been done more carelessly, till now, in many cases, it is scarcely done at all. The bricks are dabbed down on a bed of mortar, and then another bed of mortar is spread over the top of them. If the mortar is soft, a little of it runs down in places for  $\frac{1}{2}$  in. or 1 in. between them; but with this exception the upright sides of the bricks remain as clean as when they came from the kiln. What ought to be done, and rarely is done, is to push each brick, as it is being laid, towards the next one, so squeezing enough mortar between the two to "flush up," or fill solidly, the vertical joint. There is no excuse for not doing this, except the general excuse that to scamp work saves time. But when complaint is made to the foreman about it, he usually offers, instead of building the brickwork properly, to "grout" it every few courses—that is, to pour over every fourth bed, say, a mixture of mortar and water about as thick as cream. To do any appreciable good, this ought to be done at every course, before the bed of mortar on the top of that course is laid. And even then it would be but an imperfect substitute for properly "flushing up" the joints. Suppose it quite fills them while it is wet, which it may or may not do. Even then, it consists so largely of water that it will not half fill them when it is dry. Even grouting at every course, therefore, does not make as solid work as flushing up the vertical joints after well wetting the bricks. And grouting only once in four courses is a farcical performance almost on a level with the sprinkling of a brick-stack with a hose. For the bricklayer, though he leaves his vertical

joints dry and open, puts plenty of mortar on the beds. The consequence is, that the grout only gets down to the first bed, and stops there. The foreman thinks, or pretends to think, that the wall is being grouted through and through; but what really happens is, that for 3 in. of it in every foot of height the vertical joints are about half filled, and that in the other 9 in. the bricks, except on bed, are almost laid dry. Let a young architect pull a yard of it down, a week after it is built, and see for himself. Grouting is all very well as an addition to good bricklaying, but not as a substitute for flushing up the joints.

The modern bricklayer being in these respects such as he is—what is the best sort of mortar to supply him with? Probably mill mortar, thoroughly ground up by means of edge-runners, if the materials are good, and if it is used quite fresh. It works more freely than hand-made mortar, so that when spread on the bricks in a thick bed, it runs down by its own weight for perhaps an inch or two, instead of only half an inch, into the vertical joints. If made of soft, sandy, red brickbats, ground up with stone lime, it adheres to the bricks better than river-sand mortar will do, and sets much faster. Some 20 years ago a large mass of brickwork was built near London—part of it with mill-mortar made with red brickbats, and part of it with hand-made mortar containing the very best clean Thames sand. Both kinds had Dorking lime in the usual proportions. After a year, it so happened that a great part of this brickwork was taken down. The Thames-sand mortar, which was expected to be the best, and which was by far the most costly, had hardly begun to set. It could easily be crumbled to powder between the finger and thumb. Now, after 19 years, the specimens of it which were then preserved have become nearly as hard as stone; but for the first year this mortar contributed very little, indeed, to the strength of the walls which were built with it. The mill-mortar, on the contrary, was very nearly as hard a year after it was used as it now is. It was then, and is still, harder than a red Suffolk brick, though not quite as hard as a good Brosely roofing-tile. Such mortar sets in a few days, and begins to set in a few hours. It does not answer, therefore, to keep it from one day to another. The danger where there is a mortar-mill is that any sort of rubbish may be put into it and ground up—broken stocks and other clamp-burnt bricks, for instance, which do not answer at all; fragments of red pressed-bricks, which are also bad; old ceilings and other chalk-lime refuse, not to speak of stone-dust, which may be tolerated in moderation, as long as it is not used in place of lime. Broken red flower-pots grind up well in mortar, and even well-burnt clay may be allowed if a large proportion of sand is added to it.

The question of bricks and mortar being settled, points relating to the execution of the work call for attention.—The sizes and shapes of the apartments can only be accurately checked when the brickwork is begun. If the concrete was carelessly put in, some of the walls perhaps will bear on one edge of it, and not on the other. It ought then to be widened out in such places, but with cement concrete, to prevent unequal settlement. See that the right number of footings are everywhere put in, and that the proper number of additional ones have been added where projections and buttresses occur. Wherever an apparently casual earth-slip has hidden the footings or concrete, or wherever parts of them have been covered up without inspection, set a man to uncover them, and see it done. Such things awaken the curiosity of the experienced architect, and his curiosity is often rewarded by discoveries. See that the damp-course is everywhere put in so as to be below the ground floor and above the finished level of the ground, or if this is anywhere impracticable, make the necessary arrangement there for keeping the damp out. See that air-bricks will not be covered up by ground or flower-beds, and where this is liable to occur have small flues made leading down to them from the open air. See that the walls and arches of dry areas are really built in cement, and not in mortar, and that the damp-course, or a damp-course, comes above the top of them. If this is not the case, moisture may find its way into the house-walls, from the top of the dry area walls. Take care that *inverts* are properly turned to the curves shown, and not crippled. If they would not carry themselves as arches, supposing them to be the other way up, they might as well not have been built at all. Of course, they

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require proper skewbacks, and sufficient abutments.

*Facing bricks*, as soon as the point is reached at which they begin to be used, need special superintendence. It is they, and not the bricks inside the wall, that will be acted on by the weather, and therefore they must be thoroughly well burnt. When the facing bricks come from a distance, there is often trouble because they differ in thickness from those in the core of the wall. Thus, about Birmingham, Leicester, and Nottingham, it is customary to make bricks nearly 3in. thick; while round London they seldom reach 2½in. If thick bricks like these are used for facings, and ordinary stocks for the core of the wall, either the facings and backings must be very imperfectly bonded together, or the latter must be built with excessively thick mortar joints. In either case the facings are likely to bulge and crack, and where the pressure is great, the walls may actually fall. The only safe course is to have such facings purposely made to an appropriate thickness. Another difficulty with facing bricks from a distance, and especially with moulded bricks, arises from the accidents they meet with in carriage. The manufacturers state, what is usually true, that the bricks were perfect when sent off; they add that the packing was of the most careful kind, and they wind up by inferring that all the breakages must be due to careless unloading and carting. This is very often a mistake. A truck which was sent off from Leicester or Birmingham without a faulty brick in it may contain from 10 to 20 per cent. of breakages when it stands, unopened, at the station it was addressed to. The packing may be careful, and no doubt looks so at starting; but it is often far from effectual, and it might more than repay the cost if the manufacturers would sometimes send their foremen of packers to unload a few trucks at the end of their journey. Ordinary facing bricks, if chipped, have often one perfect face left, and so can be worked in; but broken mouldings are unfit for use.

"*Snaps as mang headers as you can*" was a written and signed instruction sent not long since, in defiance of the specification, from a North London firm of builders to their foreman. Probably such instructions are seldom given in writing. But there is no doubt whatever that the practice of saving facing bricks by passing off one header for two is extremely common, and extremely injurious to walls which have any serious strains to resist. The saving of money it effects is often very small, and it is apparently done almost as much for pleasure as for profit. The judicious pulling down of such scamped work will have a good effect, and the sooner it is looked out for and dealt with after the contract has begun, the better for all parties. To put snapped headers in walls is bad enough; but to put them in important structural arches is little less than a crime. Yet there have been recent cases in which arches, some 30ft in span, carrying a heavy wall and roof, have been found on examination to be mere curved troughs. To save facing bricks, they had been formed of a half-brick soffit and two half-brick sides; apparently bonding in and out, but really destitute of any bond whatever. The wall being 2ft. thick, there was a 15in. space between the vertical sides of the arch, and this space was filled in with rough brickbats of all sorts and sizes, imbedded almost at random in cement mortar! Fortunately this shameful fraud was found out in time, before the weight was put on the arches or the centres struck. It was an extreme case, perhaps; but what has been done may be done again.

#### NOTES FROM EDINBURGH.

**A**NOTHER busy and prosperous year has been experienced by the building trades in Edinburgh if the amount of work accomplished, and a rise in wages generally, can be indications of prosperity. The standard, or average, wage of masons is now 9d., and of other trades from 8d. to 8½d. Nor is there any appearance of likelihood of change, unless in way of betterment, in respect of work in prospect for the coming year. The works of improvement at the Waverley station are still far from their completion. The city itself has on hand the reconstruction of its offices, hardly begun, and a new hospital at Colinton, the usual instalment of new school building, and it is possible that the widening of North Bridge-street may be also included in the list.

The old North Bridge has all but entirely disappeared, and in its place, on the south side, the outline of the spacious arch already built can be discerned through the scaffolding erected for the construction of the west portion; on the east side great progress has been made towards completion, and the confusion has been brought into decent order; a goodly range of store-sheds covers nearly all the ground acquired; and Market-street has been continued to meet New-street, which now forms the only thoroughfare between the Old Town and the North, back of the Canon-gate-road. It is not at all likely that occasion will arise for the erection of the bridge at one time proposed to be carried over the railway from the Low Calton to Jeffrey-street. At the foot of New-street, just where it passes under the railway bridge, is the entrance to the spacious underground storage vaults, which extend under the area occupied by the sheds above. These are not less than 25ft. in width, and probably 20ft. high, lighted throughout with arc lamps, and when completed will be fitted up with hydraulic lifts and other appliances, which serve also to ventilate the cellars. These vaults are principally for the storage of grain; but, on the south side, they are apparently used as brewers' storage. There are no indications of any damp or disagreeable exhalations, though the work is only recently constructed throughout with brickwork of great thickness in walls and arching. The new gas-works and chimney are situated here, and form a large part of New-street as remodelled. The architecture of large chimneys has always been unpopular with the general public as an ornamental accessory, and we have now several in the city, forming integral parts of its best architecture, and what architectural design can do to make them in harmony with the surroundings has been successfully accomplished. The new chimney-stalk of the gasworks is fortunately higher up the hill, and does not stand so conspicuously alone as the old one, which stands beside it, and is, to all appearance, loftier and more gracefully proportioned. The new one is of much greater diameter, and has not the same graceful outlines at the top, and the stone circular arcade is heavy, and does not help it in any way.

There is little but confusion westward of the new sheds, but a commencement has been made of the new booking-office and the access to it; but all the usual conveniences are very much curtailed.

The Prudential Assurance building at the south corner of St. Andrew's-square has made very rapid progress, and the third-floor level has been reached and a portion of the cornice course laid. The interior is entirely of brickwork, which is unusual in the district, where stone abounds. Preparations are making for the erection of another insurance office building, but with only half the frontage of the square.

The opening of the McEwan Hall is a matter of much interest, but the date has not transpired, and it will probably be fixed for the day when the Lord Rector (Lord Balfour) delivers his inaugural address. The proportions and constructional details of the interior are unique, and the decoration of the dome will have at least all the advantages that brilliant and harmonious colour can impart to an interior which would be (to the taste of earlier periods) very well decorated without it. The figures (as illustrated in the BUILDING NEWS) are so far above the eye that their individuality is not unlikely to be lost in the blaze of colour.

The only large school, nearly two years in erection, opened this year is the Broughton school, which has been fitted up in a style which appears to many to be quite beyond the limits of expenditure required for elementary schools. The attempts lately made to introduce a certain amount of technical instruction and higher branches is thought by many to be inopportune and doubtful economy in view of the prospects of a well-defined system of technical instruction being organised to carry on the pupils who may desire it. At present the desire for higher instruction falls far short of what might have been expected if such instruction were really a desideratum provided for.

Little in the way of church building has been done within the year. Two new churches in the Gorgie-road were opened, and one is being erected in the southern suburbs for the Infirmary-street congregation of the U.P. church. Their old church has been converted into the Working Men's Club and Institute, this institution having

been put out of their quarters by removal of buildings for the reconstruction of the City Chambers. St. George's parish church has been undergoing extensive repair and alteration, the floor having become unsafe. Alterations do not affect the aspect of the exterior to any noticeable extent. This church is, or used to be, a fashionable west-end church, and was built at first to close up the long vista of George-street. It is provided with a lofty dome, which certainly well answers the purpose for which it was erected, and holds its own with the numerous spires and towers which have since been built. With exception of the dome, however, the architecture of the church from every side is severely plain and commonplace externally, whether as a whole or in its detail. Internally, as a sample of church planning, it has little to commend it but its substantial character and size. The cruciform plan has a shallow projection on the west or pulpit end, deep transepts and deeper nave beyond the crossing, which has a richly-panelled lath-and-plaster dome with hemispherical roof-light. This lights the central space very pleasantly; but, notwithstanding the aspect of transepts and nave beyond is gloomy and dark, by reason of the deep galleries, with their plain and heavy frontages, finish up unpleasantly close to the ceilings and obscuring the light of the windows. The distribution of light is thus extremely unequal. The interior was decorated with the drab stone-colour so popular when it was considered the right thing to dispense with anything like lively ornamentation in churches. We have changed all this, however, and with the introduction of the organ the old arrangements of the city churches, with precentory desk and choir seats inclosed, before the pulpit, generally disappeared. The only constructive alterations in the church interior of St. George's, recently made, is the opening-up of the window behind the pulpit, and finishing that end with an inner and apsidal arrangement, which allows the organ to be reconstructed in halves, one at each side of the window, the divisions being marked by the erection of handsome marble pillars. The window has been filled with stained glass, representing the Ascension, in the style of design generally adopted for the subject. The pulpit, which has been brought slightly out into the church, is the old one, and stands in its old central position, complete, with all its accessories but the canopy, which was taken away out of compliment to the organ behind it, but by no means improving the appearance of the pulpit as a whole, which is in mahogany, and occupies a large room, with its staircase at either side.

The decorator has done his best also to improve the interior, which has now been painted in more lively colour—a pale bluish green, with more of positive colour and gilding on the leading lines of the dome. Notwithstanding, the interior will never have justice done to it until galleries are removed and the light is more equally diffused. The alterations at the west end may be noted as an instance of the development of church architecture—a development for which architects are not altogether, or often not at all, responsible. It is a curious and interesting circumstance that, whenever a new Presbyterian church is built, or an old one reconstructed, the clergy, or their equivalent, the building committee, generally require an apse. They have got far beyond the wish for pointed windows, and even when the spire-and-tower is practicable, insist upon the apse. This, which may be called the "apsidal mania," accounts for a great many curiously curtailed projections at the pulpit gables, the practical use and economy of which are not easily apparent to anyone acquainted with the Presbyterian ritual, and it would be interesting to discover what reason there can be for the general demand for an architectural feature which was universally abandoned by all English Gothic architects after the Norman period as inconvenient and expensive.

#### EXPOSITION OF 1900, PARIS.

**T**HE following architects have now been appointed to carry out the work of designing and constructing the various principal buildings for the Exposition. Each of these architects was premiated in the competition which took place for the general scheme of the Exposition:—MM. Girault, Deglane, Louvet, and Thomas are intrusted with the construction of the two palaces to be erected in the Champs Elysées; M. René



Binet has the work of designing and constructing the monumental entrances to be erected on the Place de la Concorde; MM. Cassien, Bernard, and Cousin have the arrangement of the architectural and decorative portion of the new Bridge Alexandre III., to be thrown across the Seine in front of the Invalides, and also the artistic arrangement of the quays and banks of the river below the Invalides; M. Toudoire and Pradelle the palaces of Education and the galleries for the exhibits of national manufactures; M. Charles Esquié designs the palace for containing the exhibits of decorative wool and furniture; M. Charles Gautier is intrusted with the palace of Horticulture and the arrangement of the quays between the Alma Bridge and the Invalides; M. Charles Mewès with the palaces of Social Economy and Congresses, as well as the temporary bridges to be thrown across the avenues in the Exhibition grounds; MM. Tronchet and Adrien Rey with the palaces of Navigation and Commerce, of Forests, Hunting and Fishing, as well as the arrangement of the quays above the Alma Bridge; M. Louis Sortais with the palace of Letters, Science, and Arts; M. Louis Varcollier with the palace of Food Provisions; M. Blavette with that for the exhibits of cottons, tissues, and clothing; M. Jacques Hermant with the palace of Engineering and Means of Transport; M. Edmond P. Paulin, the palaces of Mechanical Processes, Mines, and Metallurgy, and also the Chateau d'Eau, to be erected in the Champ de Mars. The palace of Electricity will be designed by M. Eugene Hénard, as well as that for the exhibits of Chemical Industry. The arrangement of the existing machine gallery as a Salle des Fêtes and for the exhibits of Agriculture is left to M. Gustave Raulin. MM. Desperthes are intrusted with the palaces of the Colonies, and MM. Bonnier and Masson-Detourbet with the general service of installation of the various sections.

#### A UNIQUE JAPANESE HOUSE.

A HOUSE of novel construction which maintains an equable temperature is described by *Engineering*. It was built by Dr. Van der Heyden in the grounds of the general hospital, Yokohama, Japan. From the description we gather that the house is 44ft. in length, 23ft. in breadth, and 17ft. in height, and is built of walls of rough plate glass nearly  $\frac{1}{2}$ in. thick in two layers, separated by a space of  $\frac{1}{4}$ in., which cavity is filled with a strong solution of a salt like alum, or one of the commoner salts of soda. The panes of glass, which are about 3ft. by 2ft., are fitted into two sides of a cast-iron frame to form a box, and a number of these boxes are screwed together side by side until the length of wall has been formed. Along the top felt and boards are placed, upon which another row succeeds, and so on. The roof consists of glass plates with strips of rubber between the joints. Above is a layer of ashes and a light frame of wood covered with cement. The roof is fairly impervious to the heat from the outside, and to the escape of heat from inside. The floor is of double planks, with sawdust between. Grids in the floor give ingress to air, and plates of glass give light to a lower room partially underground. The entrance is through a corridor leading to this room and a staircase. Little air is admitted whilst a person enters or leaves the building. Fresh air is obtained by vertical pipes some distance from the house, which pipes communicate with a tunnel leading to lower room, the air being filtered by passing through cages of cotton wool. As the air emerges from its filter it strikes a large pane of glass coated with glycerine, where the few microbes which pass the filter are arrested. From this room the air thus purified passes to the upper one through regulating grids, and is thence discharged near the ceiling into a belt-like chamber round the outside of building, made of ordinary window glass; the heat on this belt is sufficient to cause a current towards a chimney, also constructed to be heated by the sun. Such are the main features. The more the sun shines or the more it rains the greater is the ventilation. The range of temperature is said to be only about 64° Fahr. The wall filling also has its function. When the sun shines, its heat does not pass through the glass, but is taken up by the liquid and more salt enters into solution; when the temperature falls at night the liquid cools, and the extra quantity of dissolved salt crystallises, and in so

doing heat is given out. Thus the theory of the action that takes place is to keep the heat during the day in the walls, and to give it up to the interior during the night. In this country the external heat would not be sufficient for such a construction to answer.

#### FACADE AND LIENZO PATIO DE LA MEZQUITA ALHAMBRA, BY HARRIET FORD.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THIS drawing, one of two, was lent us by His Excellency Sir Clare Ford, G.C.B., the English Ambassador in Rome, from the Spanish Exhibition, held during 1896 in London. They were made by Mrs. Harriet Ford during the summer of 1831, and this sketch was taken from the passage leading to the kitchen in the Alcaide quarters, and the window shown with the flower-pots opened into the dressing-room used by Mr. Richard Ford, the author of the famous book on Spain, known as "Ford's Spain," which is still out-and-away the best guide to the country; but it must be, as Augustus Hare says, the old-original undistorted edition, which formed the basis of all other guide-books, and is now very difficult to obtain. The second drawing shows the Court of Lions, and this we shall give at an early date. These sketches are really exquisite and careful studies of the detail of this most wonderful masterpiece of Moorish architecture, and our reproduction faithfully renders the delicate touch of the artistic pencil which so patiently reproduced the intricate elaboration of the work which Mrs. Ford so distinctly portrayed. Washington Irving first visited the Alhambra three years previously, but in 1829 he occupied the apartments of the beautiful Elizabetha of Farnese, second wife of Philip V., overlooking the gardens of Lindaraxa. These were the days before the place "had degenerated into a disgracefully-managed museum and annex to a bric-à-brac



SEVILLE CATHEDRAL.

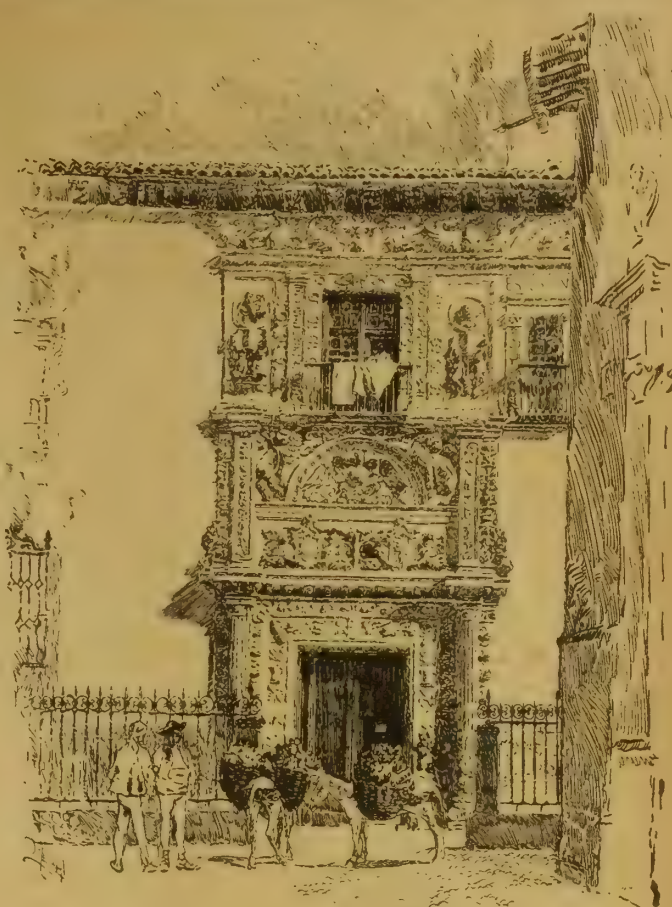
shop for the tourist." He originally published his book in 1832, and its success was immediate, both in Europe and in America, although its style was stilted and crude. Irving rewrote it in 1857 and much improved his book; but, even in its revised form, it would, in the opinion of Mrs. Elizabeth Robins Pennell, be an easy feat to belittle the author's achievement, for she adds: "Nor are its faults wholly negative. It has its moments of dulness. It abounds in repetitions. Certain adjectives recur with a pertinacity that irritates. The Vega is blooming, the battle is bloody, the Moorish maiden is beauteous, far more than once too often. Worse still, descriptions are duplicated, practically the same passage reappearing again and again, as if for the sake of padding, or else as the mere babble of the essay writer." We quote these words as the candid character of their writer's introduction to the present new edition of Irving's book, which Messrs. Macmillan and Co. have just brought out\*, might otherwise be misapprehended. She admits that it may seem injudicious to introduce so popular a volume by thus pointing out its defects. "But" one can "afford to be honest about Irving. The Alhambra might have more serious blemishes, and its charm would still survive triumphantly the test of the harshest criticism." Coleridge pronounced "The Conquest of Granada" a *chef d'œuvre*; Campbell believed Irving had added clarity to the English tongue; Byron, Scott, and Southey, his contemporaries, admired him; Dickens filled his pockets with Irving's books till he tore them to tatters; while Thackeray likened the American to Goldsmith, describing him as "one of the most charming masters of our lighter language." Whether Irving's ornate fancy commends itself to present tastes there is, no doubt, a simplicity and sincerity in his love of romance which must always be

\* The Alhambra. By WASHINGTON IRVING. With an introduction by Mrs. ELIZABETH ROBINS PENNELL. Illustrated with drawings of the places mentioned by JOSEPH PENNELL. London: Macmillan and Co.

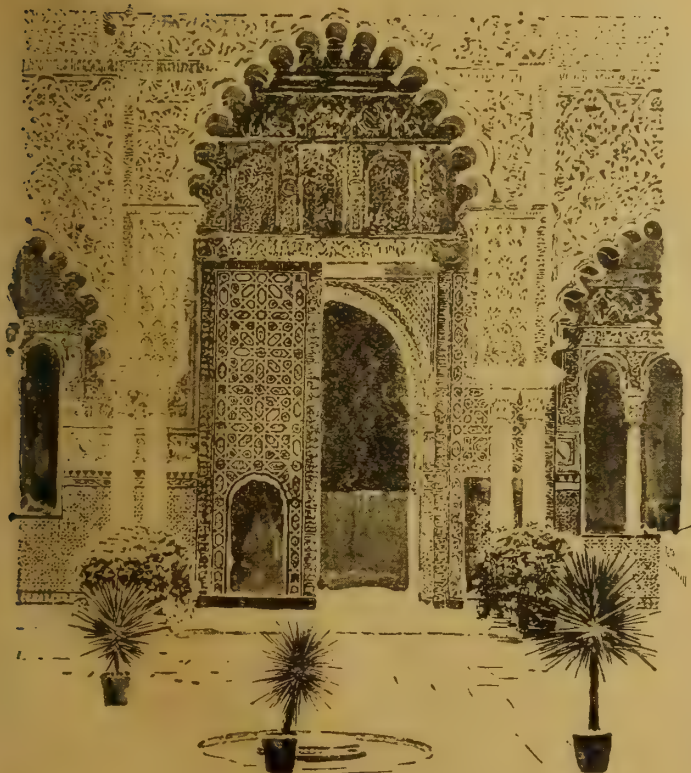




THE PALM TREE, CORDOVA.



HOUSE OF THE DARRO.



THE ALCAZAR, SEVILLE.



THE MYSTIC HAND.

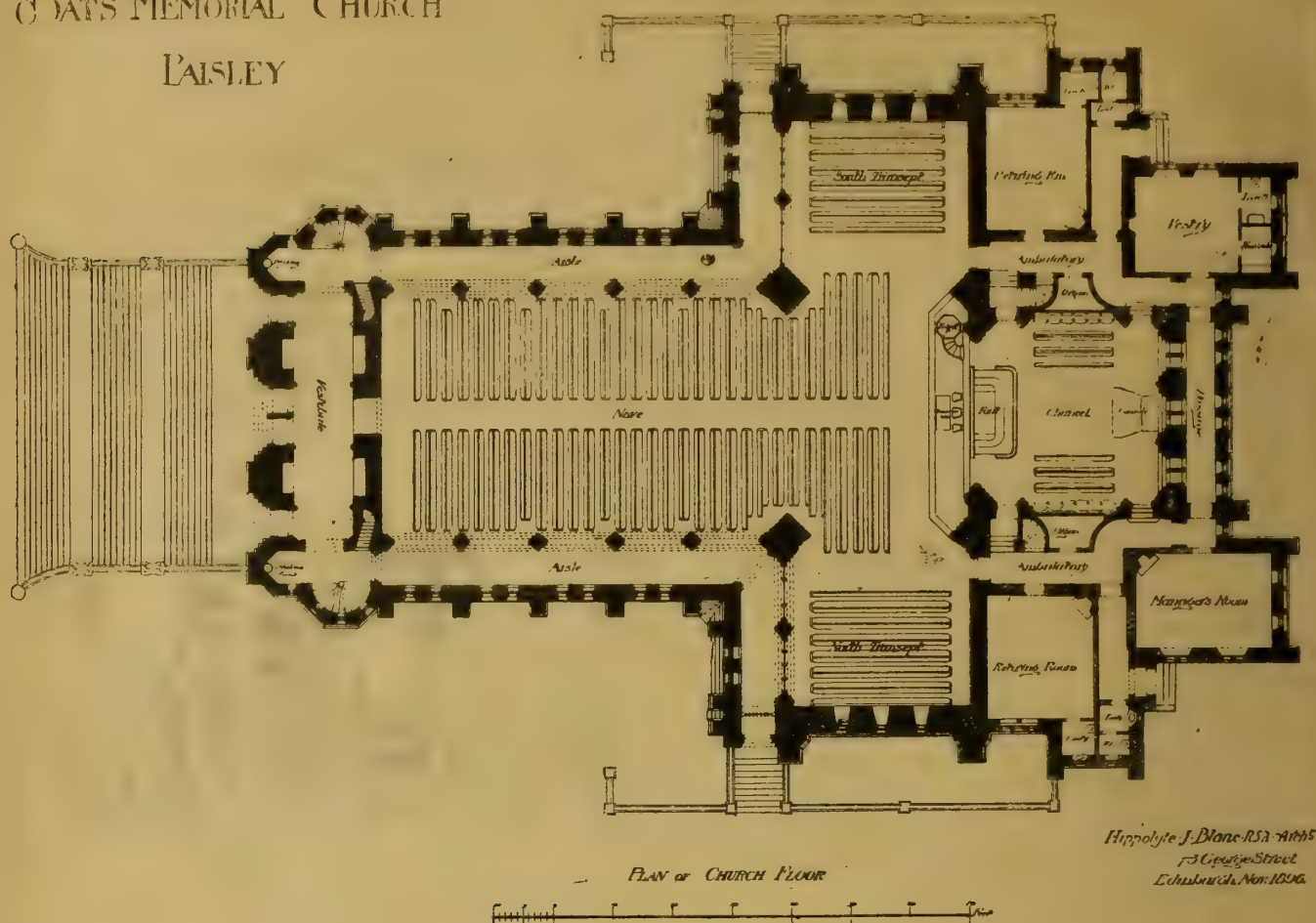
pleasing, and his power of observation gave to his writings a permanent value. There have been necessarily many changes, too, since Irving's days in the Alhambra, and as in essentials his observation seldom, if ever, played him false, his descriptions have acquired a topographical value.

To travel as he did is to know that his arid mountains and savage passes are no more exaggerated than the pleasant valleys and plains that lie between. Not Ford, nor Murray, nor Hare has replaced Irving, who invented the spirits and spooks that haunt every grove and garden of the

Alhambra. It remains the tourist's manual in the high *mirador* of the Sultanas and the Court of the Mosque, enriching fact with legend and peopling the scene with the fairest fancy; popularising history, and flavouring it with romance in a fashion not contemplated by either Ford, Murray,



# COATS MEMORIAL CHURCH PAISLEY



or Hare. The new volume from which we have thus culled some of Mrs. Pennell's remarks will be welcomed by many artistic people quite apart from its literary value, seeing that it is enlivened by a large number of drawings by Mr. Joseph Pennell, giving impressions of Granada and the locality of the scenes chosen by Irving. Some of the sketches are slight and seemingly unfinished studies, leaving the imagination unfettered by too much detail lest the poetry of the subject should perchance by any means be lost in too close a recognition of mere attention to hard facts. At any rate, Mr. Pennell has demonstrated in the past that he knows how to draw with close observation the most elaborate architecture, and having learned to accomplish an amount of dexterous draughtsmanship of the highest finish, he can suggest much with a few lines. By the courtesy of the publishers we are to-day enabled to supplement these few notes in reference to this artistically got-up book by a few typical illustrations which greatly enhance the interest of its pages, particularly to the architect and pictorial sketcher. To the general reader their introduction can but be appreciated.

## THE COATS MEMORIAL CHURCH AT PAISLEY.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

MR. HIPPOLYTE J. BLANC'S diploma drawing, deposited in the Royal Scotch Academy on his recent election as an Academician, is that which we have reproduced to-day. It represents the great church which has been in course of construction in the High-street of Paisley during the last six years, as a memorial to the late Mr. Thomas Coats, erected by his widow and family, for the use of the Storie-street Baptist congregation, of which Mr. Coats was a life-long member. It has been completed from designs of Mr. Hippolyte J. Blanc, R.S.A., who was the successful competitor among nine architects of eminence who submitted plans, and it is unquestionably one of the finest ecclesiastical buildings erected for a long time in Scotland. The site is a steep slope between the High-street and the ridge of Oakshaw-street, which had to be cleared of ancient buildings for the purpose.

It was a difficult site to deal with, but Mr. Blanc has not only overcome the difficulty, but has even turned it to account in a way which has added immensely to the dignity of the composition. It was one of the conditions that ample hall accommodation should be provided, and this has been obtained by cutting into the slope of the hill. The floor of the church being thus elevated, access is provided to it by a series of broad flights of steps. The plan, of which we give a copy, is of cruciform outline, the nave being kept broader and shorter than cathedral proportions, while the external aisles are reserved for passages only. The transepts are narrower than the nave, and their aisles are also unseated. One important feature of the plan is the prominent place given to the baptistery, which is placed behind the Communion table, and is elaborately treated in Pavonazzo marble. To the rear of this baptistery is located the choir of the congregation, and passages outside the inclosing walls give access to the catechumen's rooms, the minister's and deacons' rooms. The building is approached in front by a broad staircase in three separate flights, 40ft. wide. From the topmost terrace rises a triple porch, giving access to the church vestibule. Behind the portals is built the gable of the nave, with a richly moulded, carved, and traceried window, and on each side, extending high above the aisle roofs, and, flanking the nave, rise octagonal towers which balance the composition. On the sides the elevations are relieved with buttresses rising considerably above the aisle roofs. The same treatment is continued along the return of the transepts, and each transept gable is filled with traceried and mullioned windows. The most important feature of the design is the central tower at the intersection of the nave and the transepts, which presented a difficult problem in construction, for the nave being 40ft. wide and the transepts only 50ft., the tower above the main arches of the church roof started on an oblong plan; but, by an ingenious arrangement of stone arching, after the first stage above the roof, the tower, on plan, resolved itself into a square. It is thus carried up as a belfry. It is surmounted with a finely treated crown, the eight converging ribs of which, adorned with crocketed finials, meet in a richly panelled and traceried octagon pinnacle. The "east end" is

lighted by three tall lancet windows without tracery, the sills being 22ft. above the floor. These lights occupy the three divisions of the end wall, the divisions being marked by wall shafts, from which the groined ribs of the ceiling spring. The lower stage is treated with open and finely-wrought arcade work, giving light to the passage behind. Between this stage and the sills of the windows the wall surface is occupied by carved panels of alabaster, representing Our Saviour's Nativity, Baptism, and Last Supper. The sides of this part of the building also have the wall surfaces marked off into unequal bays, the central compartments fronting the recesses provided for the organ. The organ is thus divided—the choir organ on the one side, and the grand organ on the other. The nave is divided into a series of bays, with clustered shafts and carved arched mouldings. The clerestory roof has formed a convenient subject for ornate treatment, and a special decoration has been given to the groined ceiling, where the several compartments are upon a rich ground, treated with interlacing foliage, entwining discs containing emblems of the Evangelists, and angel forms. The interior furnishings of the church are on a scale befitting its importance. The floor of the choir is treated with marble mosaic, and so is the floor of the front vestibule. The pulpit is a temporary experimental one, and will be soon replaced with a permanent one. In the matter of heating and ventilation the most approved methods have been followed. The building has been carried on from the beginning to end without ceremony of any kind, but on the front gable wall is a memorial tablet with this inscription:—"To the glory of God, and in memory of Thomas Coats, of Fergushie, Paisley, erected by his Widow and Family, 1894." The work has been under the immediate superintendence of Mr. Alexander Scott, clerk of works. The total cost of the edifice will be about £100,000.

## THE BUILDING TRADES EXHIBITION.

THE Building Trades Exhibition which opens at the Agricultural Hall on March 20, 1897, will, without doubt, be the best ever held. Mr. Greville Montgomery, who in 1895 secured the active co-operation of the Science Committee of the



Institute, and the support of the Society of Architect and the Architectural Society, is again similarly helped, and we believe other patronage is secured of the kind extended before by the Duke of Fife and the Lord Mayor.

Professor Banister Fletcher is again the Chairman of the Consultative Council, which is reinforced this time by a very strong accession of the leading architects and artists. Mr. Alfred Waterhouse, R.A., Sir Arthur Blomfield, A.R.A., Mr. G. F. Watts, R.A., have joined, together with a number of other influential men.

The competitions in handicraft, which proved so interesting a feature of the exhibition in 1895, will be greatly extended next year, and will be held every night throughout the week. The prize list will also be a much larger one.

A great proportion of the space has already been taken by the best firms, and a really good representative exhibition is assured.

#### CHIPS.

Mr. T. Batterbury, F.R.I.B.A., F.S.I., hitherto practising at 29, John-street, Bedford-row, has removed his offices to Imperial Chambers, 47, Chancery-lane.

The Denny and Dunipace Hospital Committee resolved on Friday to proceed with the erection of a cottage hospital upon a site at West Borland, Denny, in accordance with plans prepared by Messrs. McLucie and Walker, architects, Stirling, at an estimated cost of £750. The accommodation will include a male ward and a female ward, operating-room, and attendant's house. The hospital is not intended for infectious diseases.

A St. George's Ensign, measuring 27ft. by 13ft. 6in., has been presented by Mr. H. L. Waddington for use on the tower of St. Alban's Cathedral, and was first flown on Christmas Day.

Extensive additions are about to be made to the lunatic asylum at Denbigh, the contract for which, exceeding £50,000, has been placed in the hands of Mr. Samuel Warburton, of Miles Platting, Manchester. Messrs. C. O. Ellison and Son, of Liverpool, are the architects. The works are to be commenced early in the New Year.

By 328 votes to 130 the ratepayers of Launceston decided, last week, to accept Mr. J. Passmore Edwards's offer to erect a free library building in the town, the condition being that the Public Libraries Acts should be adopted. A committee has since been appointed to obtain plans, and prices of the several suggested sites, and submit them to the town council at an early date.

The estimates of the Insanitary Property Committee of the Liverpool City Council for 1897 include recommendations for borrowing the sum of £30,000 for the purchase and demolition of insanitary property, and the sum of £10,300 for completing the erection of labourers' dwellings in Arley-street, Gildart-gardens, and Ford-street.

The isolation hospital, Crewe, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves, with ornamental tiled sides, and with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A new police-station has been erected at Moreton, Gloucestershire, and special consideration has been given to the ventilation, which has been carried out on the Boyle system.

A well-sinker, named Charles Williams, was drowned at Hastings Corporation New Waterworks at Brede on Tuesday. Testing operations are being carried on to ascertain the extent of the supply to be obtained from Brede Valley, and deceased was being lowered, with a workman named Frank Brett, to adjust the pumps, when he fell into 15ft. of water. Brett tried to hold him, but was unsuccessful. Williams leaves a wife and two children.

A storage reservoir, to contain about 6,000,000 gallons, with filter-beds and service reservoir, is about to be constructed at Tranwell, for the Morpeth Corporation. Mr. A. S. Dinning, 25, Ellison-place, Newcastle-on-Tyne, is the architect and engineer, and the tender of Mr. W. Carr, of Tyne View, Hexham, has been accepted for the works at £4,248.

The poll of the trustees of the Manchester Royal Infirmary on the question of a rebuilding and extension on the site in Piccadilly, has been carried, by a narrow majority, on an exceptionally large vote, resulting as follows:—For the proposal, 449; for the amendment, declaring that it was not desirable at the present time to extend the ground area of the existing infirmary buildings, 403. Nearly 500 trustees did not vote. The only alternatives which were considered were that of rebuilding on the present site, and that of erecting a supplementary hospital—not an entirely new infirmary—at Stanley Grove.

#### COMPETITIONS.

**BUILDING TRADES EXHIBITION.—POSTER DESIGN COMPETITION.**—The Management of the Building Trades Exhibition, 1897, offer a premium of £10 for the best design for a poster, to be used in advertising the above exhibition. (1) The poster to bear the following words:—"Building Trades Exhibition, Royal Agricultural Hall, London. Open from Saturday, March 20th, to March 27th, 1897. Offices, 43, Essex-street, Strand, W.C." (2) The size to be 30in. by 20in., but competitors may make the designs larger if they wish, with a view to their reduction. (3) The poster to be executed in not more than three colours. (4) Designs to be delivered not later than February 1st, 1897, at the offices of the exhibition, 43, Essex-street, Strand, and to bear a *nom de plume*, together with a sealed envelope containing the name and address of the competitor. (5) The designs to become the property of the management of the Building Trades Exhibition, and the name of the successful competitor to be published in the architectural and other papers. The adjudicators are Mr. Seymour Lucas, A.R.A., Professor Banister Fletcher, J.P., F.R.I.B.A., and Mr. H. Greville Montgomery.

**DEWSBURY.**—At the meeting of the Dewsbury and District Joint Infectious Diseases Hospital Board, held on Thursday in last week, the report of a sub-committee on the five designs sent in for a hospital building was submitted. Mr. Crawshaw said, before they considered the report, he wished to point out that the ex-Mayor (Alderman G. A. Fox) had been a member of the sub-committee appointed to consider the plans, and had had experience which no other architect had of other institutions, by visiting some of them at the expense of the board. He asked whether the sub-committee had taken into consideration whether it was just and fair to allow one of their own members to go to Edinburgh and other places, to see all there was to be seen, and at the expense of the ratepayers, and then to send in plans in competition with those who had not had such advantages? The chairman, Mr. Harrogate, said the sub-committee came before the board with a recommendation, as they were asked to do, and so far as he knew, none of them had any knowledge of those who had submitted the plans. They did not know whose plans they were that had been recommended, and they were not yet selected; but if the ex-mayor had sent in plans, he did not see any reason why he should be debarred from competing. Mr. Crawshaw pressed his point, and expressed an opinion that plan No. 1 should not be taken into consideration under the circumstances. After further discussion, the report was read, and recommended that the first premium be awarded to the author of the designs numbered 1, and the second premium to the designs numbered 2. The chairman explained that the total cost of No. 1 scheme was £32,200, and No. 2 scheme £35,395 8s. 2d. The town clerk announced that "No. 1" was by Mr. G. A. Fox (Messrs. Holtom and Fox), architect, Dewsbury; and "No. 2" by Mr. John Lane Fox, architect, Dewsbury, and that the other competitors were Mr. F. W. Ridgway, architect, Dewsbury; Mr. H. H. Hall, architect, Shaw Cross; and Mr. A. H. Marriott, architect, Dewsbury. A formal resolution was then moved awarding the first premium to Mr. G. A. Fox and the second premium to Mr. J. Lane Fox, and the clerk was instructed to retain the plans of the first-named architect and return the others to the respective competitors. We understand that the sub-committee only spent three-and-a-half hours in examining the five sets of plans, covering some forty sheets of drawings. The opening remarks of the report accompanying Design No. 1 sufficiently indicated the authorship of that set of plans, as it referred to the authors' previous experience in hospital planning, whereas no other competitor could lay claim to any such advantages. The selected design is priced out at 4d. per cube foot—not an extremely high estimate for such a class of building.

**DOUGLAS, ISLE OF MAN.**—The competition for the new municipal buildings, to be built in Ridgeway-street, has not yet been settled. The corporation met in committee, and a resolution was proposed to award the first premium of £40 to the design sent in under motto "Mona," the second of £20 to "Quocunque Jaceris Stabit," and the third of £10 to "Utility." Considerable opposition was raised, and it was determined to

refer the whole matter back to the committee, with a view to reconsideration, it being alleged that the site was inadequate for the requirements of the town. The town clerk advised the members that, even if the present scheme were abandoned, the premiums offered must be paid in accordance with the competition conditions.

**SKIPTON INFECTIOUS HOSPITAL.**—The Skipton Joint Hospital Committee, at their meeting on Monday, had before them the report of Mr. Thomas Worthington, of Manchester, as to the best six designs for an infectious hospital. There had been twenty-seven sets sent in for competition, but Mr. Worthington had brought the number down to six. He had submitted these to a further minute examination, with the following result:—1st prize, £20, Mr. G. E. Bolshaw, architect and surveyor, Southport, Crewe; 2nd prize, £10, Mr. A. Cullen, architect, Motherwell, Glasgow; 3rd prize, £5, Mr. Hampden W. Pratt, Chancery-lane, London. Mr. Bolshaw's estimate for the carrying out of the winning design amounted to £10,000. The committee decided to pay the foregoing premiums, and also to ask Mr. Bolshaw to meet them, with a view of coming to terms concerning the erection of the hospital.

At the last meeting of the London County Council, the Housing of the Working Classes Committee recommended that Mr. Rowland Plumbie be employed to design the cottages to be erected on the Trafalgar-road, Greenwich, site, and afterwards supervise the erection for a commission of 4 per cent. on their cost. Objection was raised that Mr. Plumbie is a district surveyor, and an amendment was moved that the work be undertaken by the board's architect, Mr. Blashill. On a show of hands being taken, the voting was equal, 35 on each side, but a division resulted in the carrying of the committee's recommendation by a bare majority of one, the numbers being 46 for and 45 against.

St. George's Church, Durham-road, Gateshead, is nearing completion. The church will accommodate 630 persons, and the total cost, including tower, is £5,900. Mr. Pringle, of Gateshead, is the contractor. The style is a simple treatment of 13th-century Gothic. There are narrow aisles, the walls being carried up to obtain a high-pitched arcade. There is no clerestory. The fittings are pitch-pine, and the floor is of wood-block flooring. The chancel floor is mosaic, and the walling of stone snuck-faced. Mr. Stephen Piper, M.S.A., of County Chambers, Newcastle-on-Tyne, is the architect, his plans having been selected in a limited competition.

Mr. V. Griffiths, Government valuer, at an interview with the Portsmouth Assessment Committee, has intimated that the assessment of Portsmouth will be increased by £10,000. The area includes the new barracks and the gun-wharf, but does not take in the dockyard and other important establishments, which are situated in the parish of Portsea. A considerable period will elapse before the Government property in the parish of Portsea is revalued. The area that has been reassessed is almost exclusively devoted to military purposes.

The Bristol Corporation (Docks) Bill, which provides for the extension of the harbour railway, and the construction of bridges across the Avon, and wharves abutting on the Floating Harbour, has been duly deposited, and to-day (Friday) the City Council will be asked to confirm the resolution passed in September to proceed to apply for Parliamentary powers to carry out the several works therein mentioned. At the meeting referred to, the council decided, by a majority of 51 votes to 2, that it was desirable to promote a Bill in Parliament, and when, at the subsequent town's meeting, a poll was demanded, the votes recorded at such poll showed a majority of about four to one in favour of the scheme. The estimates for the purchase of land and the execution of the works proposed to be authorised by the Bill is £199,900.

A special meeting of the Stockton-on-Tees School Board has been held for the purpose of considering what steps should be taken with reference to an action commenced by Mr. Bottomley, architect, for the recovery of a balance of a claim for commission amounting to £677 19s. The clerk said he had informed Mr. Bottomley that £143 19s., not £677 19s., was the balance of his claim against the board for commission as architect in connection with the higher grade schools. In reply he got a solicitors' letter decisively disclaiming the suggestion that £143 19s. was due, and stating that as they understood the board were willing to refer the matter to arbitration, that could be done; but failing a speedy answer, they would issue a writ. No decision was arrived at; but it was suggested that Mr. Bottomley should be interviewed with a view to making an amicable settlement.



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## ILLUSTRATIONS.

FACADE IN THE ALHAMBRA.—BRAMHALL HALL, CHESHIRE.—RESIDENCE, POLLOKSHIELDS.—THE NEW PREMISES OF THE SURVEYORS' INSTITUTION.—"AT VERONA."—THOMAS COATS MEMORIAL CHURCH, PAISLEY.—PICTURESQUE OLD HOUSES AT WALSALL.—DESIGN FOR NAVE PULPIT FOR CANTERBURY CATHEDRAL.—MARKET PLACE FOUNTAIN, ROTHENBURG.—ROMSEY ABBEY.—WAITING HALL OF THE EQUITABLE INSURANCE OFFICE, BERLIN.

## Our Illustrations.

FACADE AND LIENZO PATIO DE LA MEZQUITA ALHAMBRA: BY HARRIET FORD.

See description and further sketches on page 4.

BRAMHALL HALL, CHESHIRE: THE HALL, BY JOSEPH NASH.

Our series of reproductions from the original drawings by this well-known architectural artiste have extended over two years, commencing on January 5, 1895. In this way we have given nearly twenty examples from national and private collections. The last was published on October 2, 1896, when we gave an autograph exterior view of Bramhall Hall Mansion. To-day an interior of the great hall in the same house is photographed after another of Nash's illustrations of Mr. C. H. Nevill's historic home. We are indebted to Mr. W. T. Oldrieve, of H.M. Office of Works (who also lent us the exterior view last given), for its loan. A full account of the history of Bramhall Hall will be found, with some views and a plan, in the BUILDING NEWS for January 13, 1888, drawn by Mr. Maurice B. Adams. The interior now given is dated 1841.

## RESIDENCE AT POLLOKSHIELDS.

This house is being erected for Mr. John Morrison, of Messrs. Morrison and Mason, Ltd., and is located in Pollokshields West, a suburb of Glasgow, composed of villa residences, and it is situated on a rising part of ground commanding a magnificent view of the city. It is built of red sandstone from Locherbriggs Quarry, and finished mostly in the interior with oak. The slates are Elterwater green, with red ridge-tile of Cooper and Co.'s make. The building was planned, and is being carried out under the superintendence of Thomson and Sandilands, architects, Glasgow. The drawing illustrated was shown in last season's exhibition of the Glasgow Institute of Fine Arts.

## SURVEYORS' INSTITUTION.

THE new buildings of the Surveyors' Institution, of which we publish the perspective drawing and plans, are to stand on the site of the previous premises of the Institution, which are at present being demolished. The available area for building has, however, been enlarged by the acquisition of the next house, at the angle of Great George-street and Little George-street. The architect, Mr. A. Waterhouse, R.A., has had to provide in the building not only the accommodation for the Institution proper, but also rooms for the Tribunal of Appeal, and a museum for the forestry collection, of which the Institution is gradually making a special feature. The ground floor,

which has a large hall and a dignified staircase, contains on the left of the entrance a reading and tea-room, and on the right the secretary's office. The other rooms of the secretarial department occupy a position further back, and the remainder of the floor is taken up by a consultation room, an arbitration room, and other rooms for the Tribunal. On the first floor, the most important features are the great meeting room, with corridors in Little George-street, a large room for the Council and for arbitrations, and the library, which occupies the whole of the frontage to Great George-street. The museum of forestry is located on the second floor, where are also rooms for the secretary, and a gallery in communication with the great lecture-hall. The third floor contains a gallery for the forestry museum, caretaker's rooms, and storage. The contractors selected are Messrs. Foster and Dicksee, of Rugby and London.

"AT VERONA": FROM WATER COLOUR EXHIBITED AT THE ROYAL ACADEMY, 1896, BY A. WALLACE RIMINGTON, R.P.E.

A STRIKING feature of Italian cities which might well be reproduced elsewhere is the campanile or clock tower which frequently decorates their market-places. The well-known Piazza delle Erbe at Verona has two such towers, the finer of which is that given in our illustration. It is built of brick, mellowed into a delightful tint of burnt sienna and grey, is nearly 300ft. high, and was commenced by the Lambert family, of Verona, in 1172. Though overlooking the market-place, it is really attached to the Piazza dei Signori, close to which stand the celebrated Gothic tombs of the Scaligers. The Piazza delle Erbe, into which leads the narrow "calle" given in the sketch, is one of the most picturesque in Italy, its old houses standing on vaulted arcades, and decorative with frescoes and confusion of many-coloured balconies and jalousies. It was the forum of the ancient Roman city of Verona, and is still the centre of its life and activity.

## THE COATS MEMORIAL CHURCH AT PAISLEY.

Description and sketch plan will be found on page 6.

A ROW OF PICTURESQUE OLD HOUSES, DIGBETH, WALSALL, NOW DEMOLISHED.

As a record of an uncommonly quaint example of old plastered houses this double-page plate deserves a place among the folios of all lovers of historic architecture. Modern "improvement" in its march, has necessitated the demolition of this "row" from ancient Walsall. Their qualities of quaintness and artistic variety, their association with the past and value as a chronicle work preserving, counted as nought in the balance of money's worth, and so they have gone "for ever and aye." No doubt the dwellings were dirty and out of repair, and any "approved method of restoration" would have spoiled them, though we never heard that the Society for the Protection of Ancient Buildings did anything to insure their being upheld. The houses were pulled down without a protest, and the house-wrecker alone attended the ceremony. Local histories, so far as we can gather, contain no mention of their story, and like many another unsophisticated, but none the less typical, example of vernacular architecture, in all probability no person of consequence was associated with their tenancy, and their designer and builders are unknown. Mr. Jon Ellis, an architect now in practice in Walsall, and to whom we are much indebted for directing our attention to these buildings, has been unable to find any particulars about them. They were in a dilapidated condition, and, were, we suppose, the oldest houses in the town. Of enriched detail there was no trace whatever externally, and alterations during succeeding generations had, of course, taken place. Their effect depended entirely upon the picturesque contrivance of a group of gables, all being covered with plain rough-cast, which was even extended over the chimney-stack seen beyond the main roof. Our drawing is based upon a capital photograph taken some years ago by Mr. J. A. Draycot, of Walsall.

## NEW PULPIT FOR THE NAVE OF THE CATHEDRAL AT CANTERBURY.

This pulpit will be of English oak, on a stem and base of Purbeck marble. The panels will be carved, having three subjects—the Crucifixion being the central one, with the Annunciation and the Resurrection in either side panel. Eventually the oak may be stained, to be some-

what dark in tone of colour, and the carving be relieved by some delicate gilding colour being put in the backgrounds of the panels. The pulpit is to stand against one of the nave-piers on the north side. It has been designed by Mr. G. F. Bodley, A.R.A., and will be carried out by Messrs. Rattee and Kett, of Cambridge. The architect's detail drawing here given was shown in the last Exhibition of the Royal Academy.

## MARKET FOUNTAIN, ROTHENBURG.

ROTHENBURG is too well known to need any description, with its surrounding towers and encircling wall along the ramparts of the inclosing moat. The Rathaus, in the market-square or Place, with its Renaissance facade and Gothic-gabled rear front, is naturally among its most conspicuous buildings, though the Catholic church of St. James is an interesting and important work, dating from 1373-1453, and containing some remarkable carvings at the west end of the choir, enriching the altar of the Holy Blood, the relics of which are enshrined within a golden cross over the table. The houses of the streets of this picturesque old German city are quaint with many an oriel and shaped towering gable, while from the site of the now ruined castle a splendid peep of the valley of the Tauber is obtained. The chapel of St. Blaize is the only relic left of the old fortress which at one time defended Rothenburg as a free city of the Empire. The fountain, of which a double-page plate is herewith given, needs but little introduction, and, as a matter of fact, there is hardly anything to say about it. The central shaft, which in itself is richly ornamented, is surmounted by a group of St. George and the Dragon, and the walls of the basin or trough are carved with patterns almost Elizabethan in style. The composition, architecturally, is distinctly picturesque, even if, for everyday use as a fountain from which to fetch water, it is hardly a perfect contrivance. The great Breslau Pump at Niesse, which we gave a drawing of on January 4, 1895, though quite different in design, was more practical in this respect. Mr. Ernst Wasmuth, in his "Denkmäler Deutscher Renaissance," has given some other similar examples, but we know of no English work which at all adequately illustrates these old German buildings. They are rich in suggestive detail and design, and we have on more than one occasion expressed our indebtedness to this admirable German publication.

## ROMSEY ABBEY.

TOWARDS the west Romsey Abbey stands bold and square, its plain flat Early English end with three lancet windows being, though forceful and impressive, a too abrupt block to the stretch of level mead and stream beneath it. But its lines soften towards the little town, and the Norman transepts and chapels round up to the east end, where vegetation has ventured nearer, and where mosses have mellowed the stone more warmly. The interior is majestic, after the manner of much larger buildings, the Norman arcading having great depth and richness, and the ornaments and carved work being in perfect harmony with the solid structure they adorn. The carving, indeed, is very interesting, and well illustrates the ideas of an imaginative workman. One of the corbels shown in the sketch represents a musician playing what I believe to be a *crouth*, or *cruth*, an ancestor of the violin. R. M. D. L.

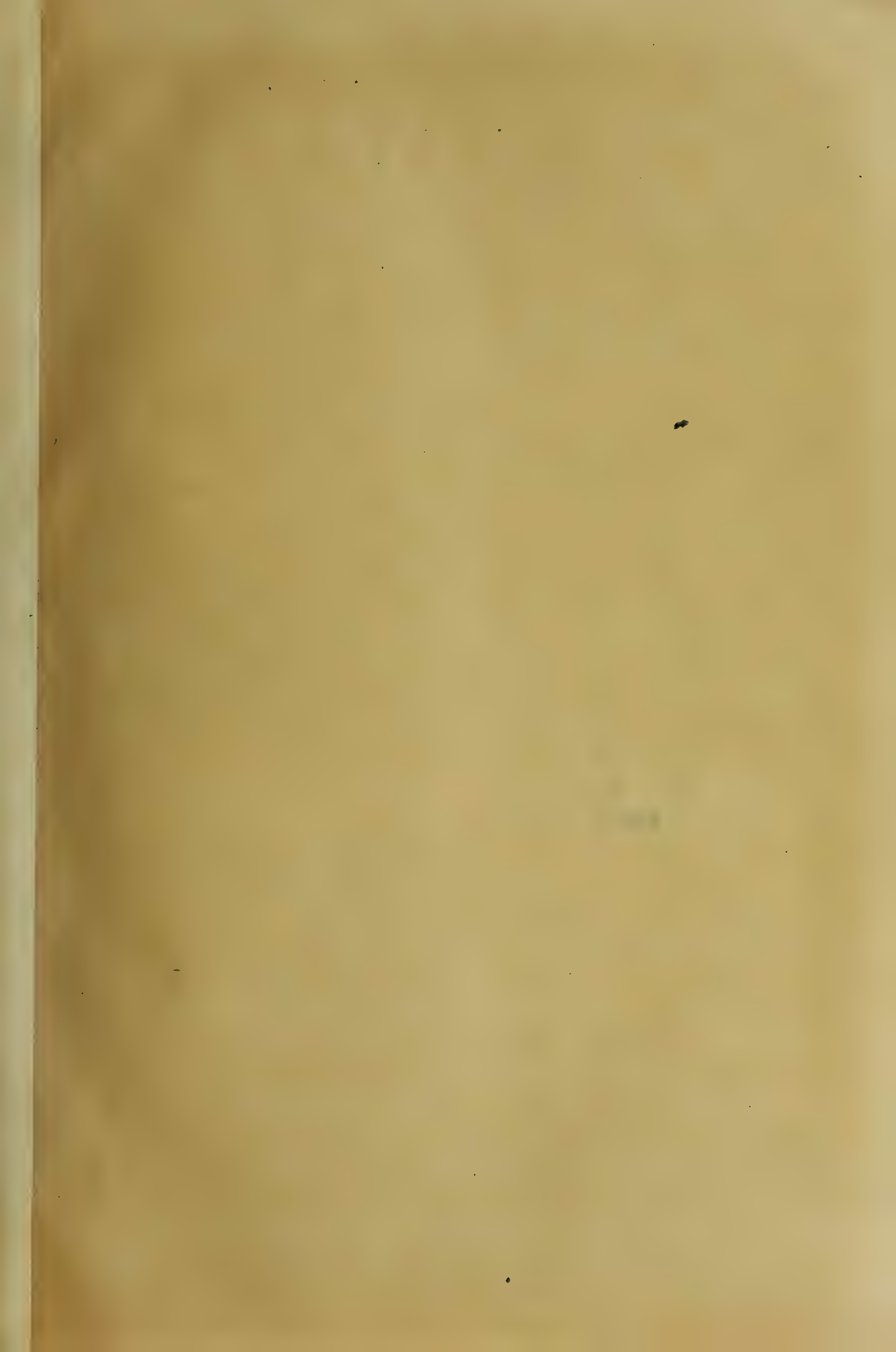
## WAITING HALL OF THE EQUITABLE INSURANCE OFFICE, BERLIN.

THIS is an apartment in the building which the architect, Prof. Carl Schaefer, designed for the Equitable Insurance Office, Berlin. The wood decorations and furniture are from the cabinet works of Herr A. Bembé, of Mayence. The view from which our drawing is made appeared in Mr. Ernst Wasmuth's series of modern German interior works, entitled "Der Innere Ausbau."

Mr. Harpur, the borough engineer of Cardiff, has prepared plans and estimates for a new wing at the sanatorium in that town. According to the proposals which the health committee have adopted, two additional male wards and one paying patients' ward will be provided, the whole to cost £20,000.

At St. George's Church, Edinburgh, stained glass is being placed in the three-light west window, the subject being the Ascension. The window, which was unveiled on Sunday, has been executed under the direction of the architect, Mr. Leadbetter, at the studios of Messrs. A. Ballantine and Gardiner, George-street, Edinburgh.

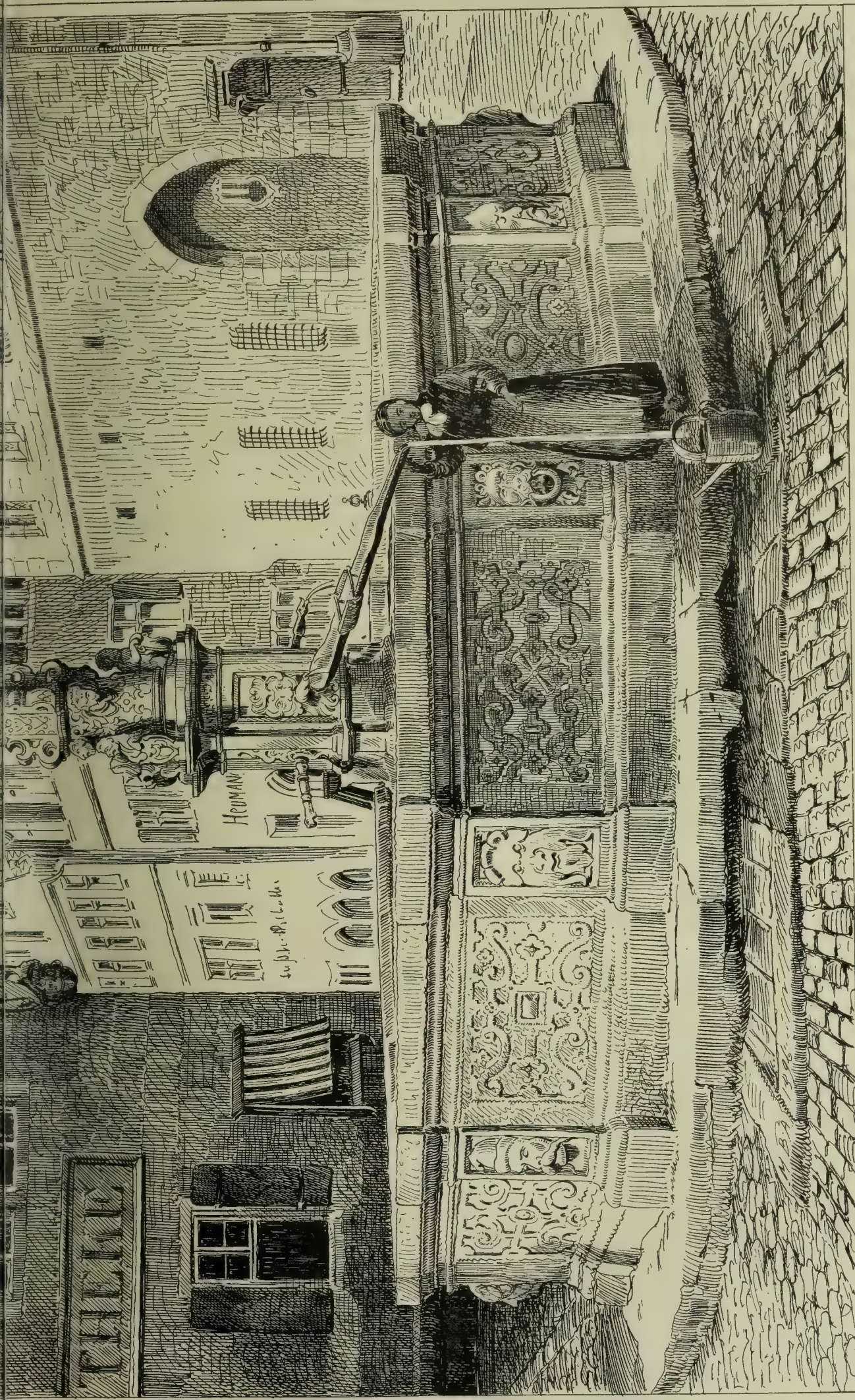












MARKET PLACE FOUNTAIN ROTHENBURG DRAWN BY MAURICE B. ADAMS, F.R.I.B.A. 1896

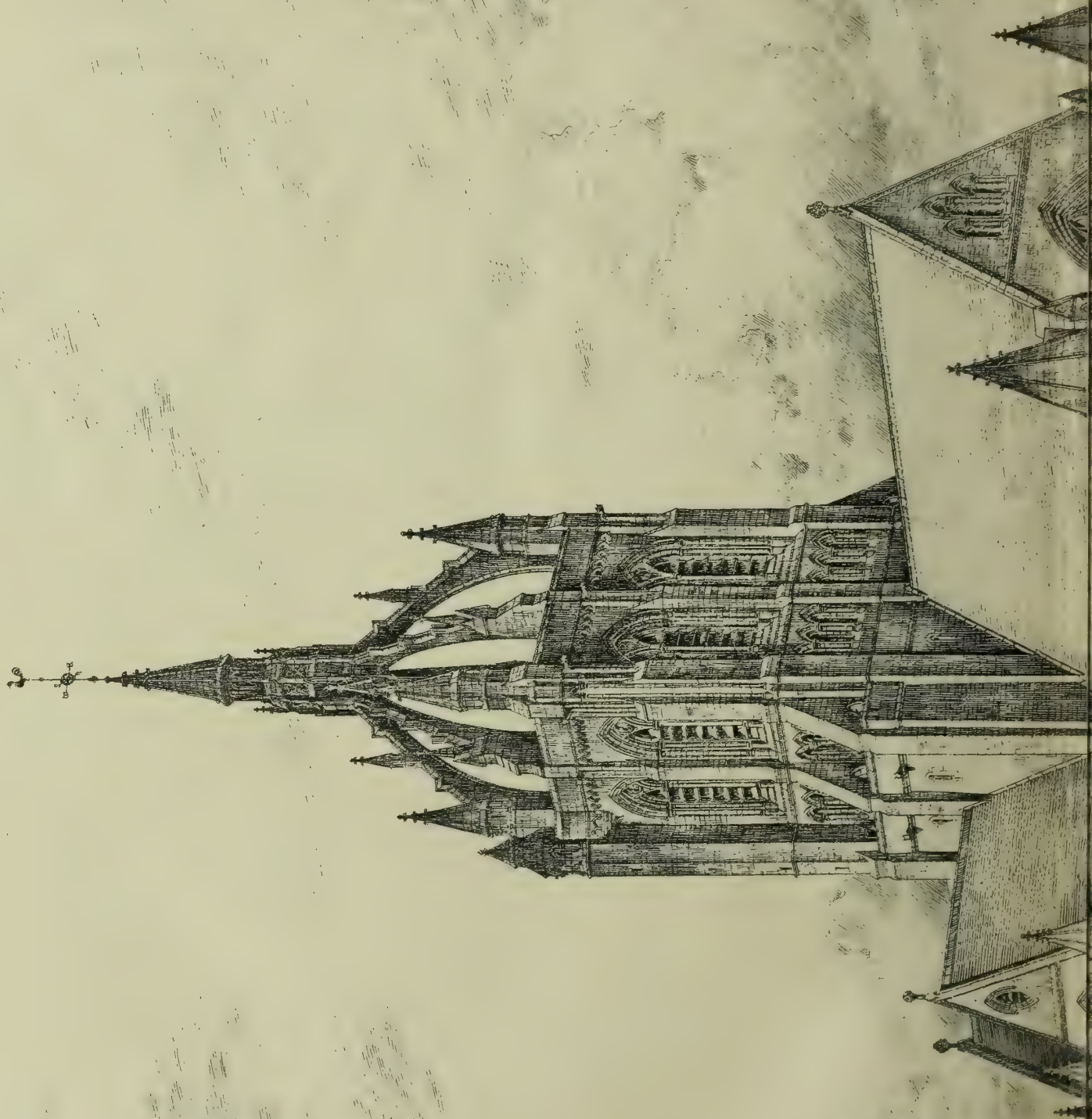




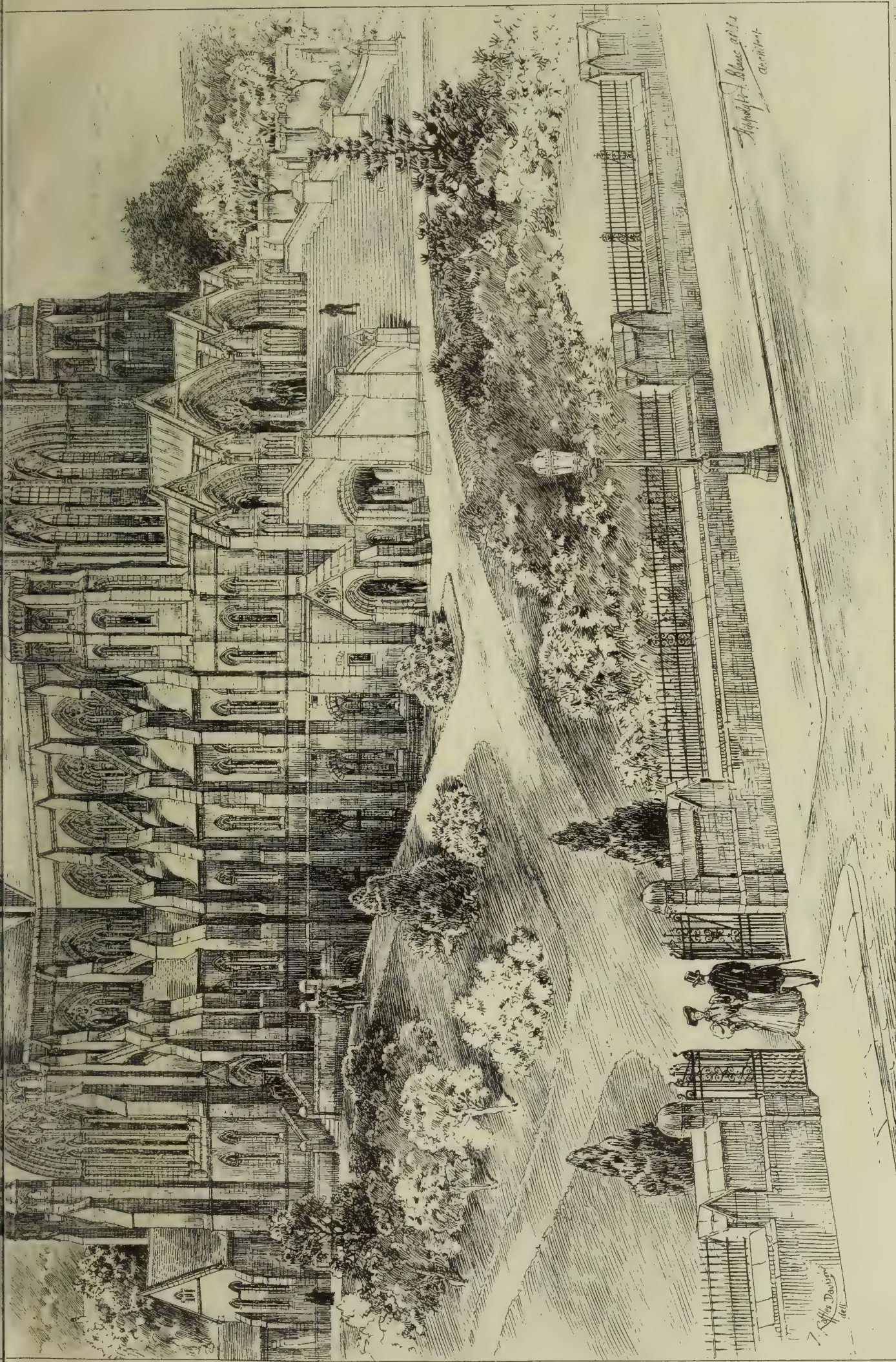












THE THOMAS COATS MEMORIAL CHURCH, PAISLEY.

(R.S.A. DIPLOMA DRAWING)

HIPPOLYTE J. BLANC, F.S.A., ARCHITECT.

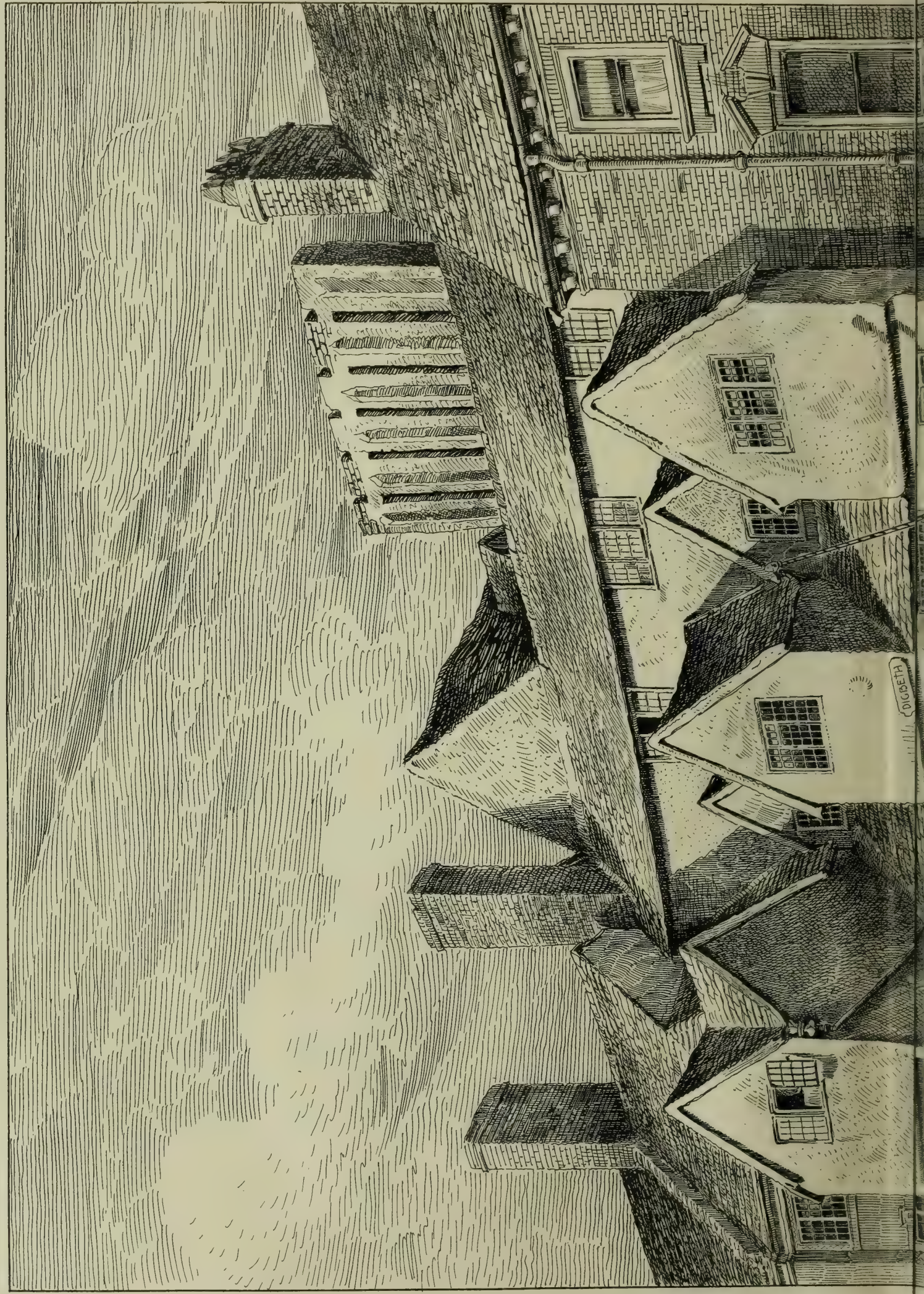




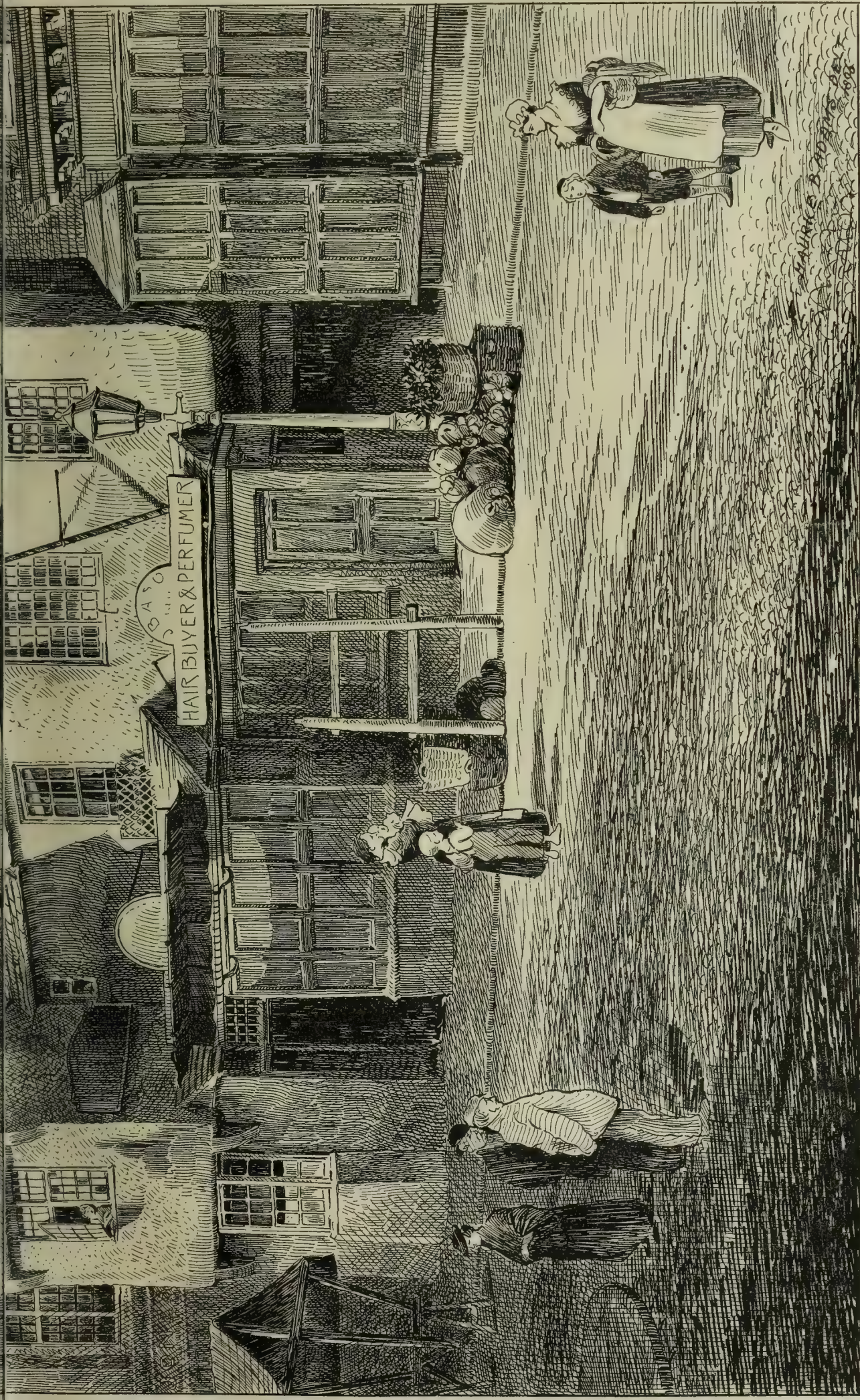












A ROW OF PICTURESQUE OLD HOUSES AT WALSALL RECENTLY DEMOLISHED







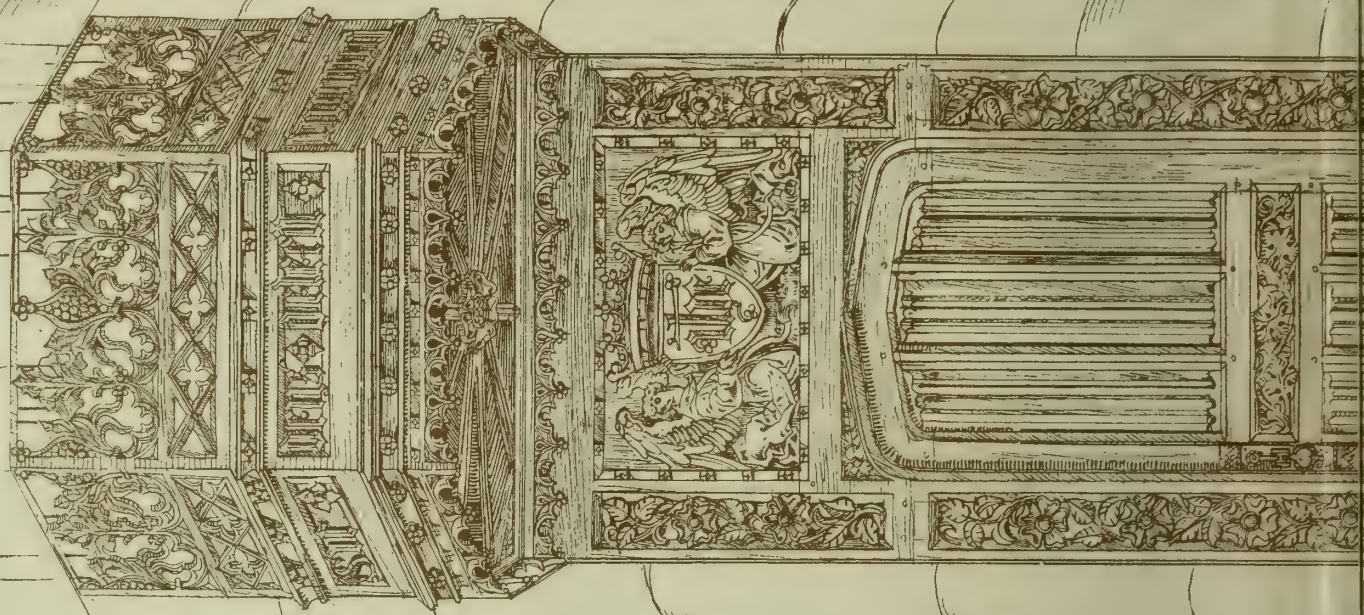
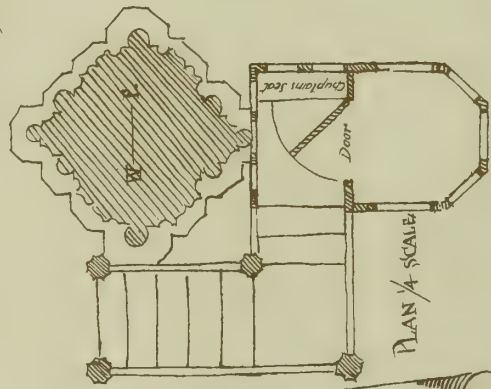




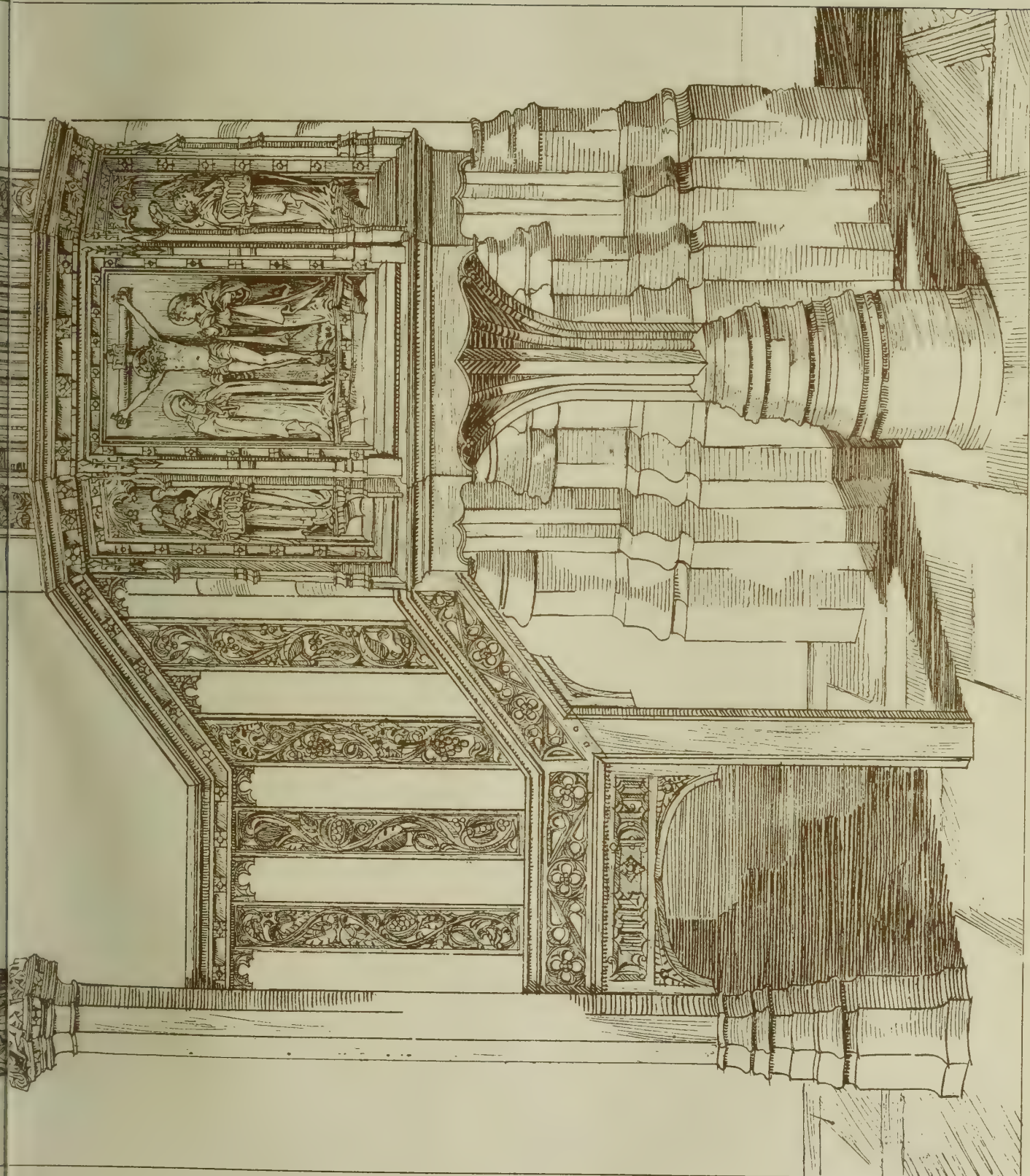
DESIGN for NAVE PULPIT for  
the CATHEDRAL CHURCH  
of CANTERBURY

SCALE ONE INCH = ONE FOOT.

G.F. BODLEY A.R.A. ARCHITECT  
LONDON.













## Building Intelligence.

**HULL.**—A new grain elevator has just been commenced on the bank of the River Hull in connection with the Clarence Flour Mills, belonging to Mr. Joseph Rank. The building will be built of Lincolnshire hand-made bricks and roofed with slates, and is being carried out by Mr. Edward Good, builder, of Hull. Mr. J. Harman, of Hull, was the contractor for the foundation, and Messrs. J. Robinson and Sons, engineers, of Rochdale, are supplying and fixing the iron and steel work. The whole under the supervision of Messrs. Gelder and Kitchen, architects, of 76, Lowgate, Hull. The total cost will be about £7,000.—Extensive alterations and additions to business premises, Prospect-street and Story-street, Hull, are now in progress for Messrs. Wallace and Co. The new buildings will be in Lincolnshire red bricks with Ancaster stone dressings and covered with Welsh slates. The entire premises will be fitted throughout with electric light and hot water heating apparatus, and a hoist will connect the different floors. The joiners work will be executed by Messrs. Shepherdson and Son, of Driffield, under the supervision of the architects, Messrs. Gelder and Kitchen, of Hull.

**BRISTOL.**—The reopening and dedication of the Moravian church, Maudlin-street, which has recently been rebuilt on the foundations of the old church, which dates back to 1756, took place on December 19. About 30 years ago the level of Maudlin-street was raised, the church being left at an inconvenient depth below. In order to bring the edifice up to the new street level it has been practically rebuilt at a cost of £2,000. Beneath the church is a schoolroom, 51ft. by 30ft., a meeting-room, and other offices, all of which are well lighted owing to the natural fall of the ground. Externally the buildings are designed in accordance with the style which prevailed in the last century. The church is faced with red brick, with stone-dressings, the porch being entirely of stone, with doorhead, carved by Mr. Gilbert Seale. The lower portion of the walls has been rough-cast, with pebble-dashing. The roofs are covered with Broseley tiles. The contract was taken by Messrs. Cowlin and Sons, of Bristol, in July last, under the supervision of the architect, Mr. Edward Gabriel.

### CHIPS.

Some idea of the activity in the building trade in Sheffield may be gathered from the fact that during the past year considerably over 1,000 houses have been erected, to say nothing of additions to business establishments, the improvements in High-street, &c. The year has been the busiest on record for the building trade in that city.

A village institute at Little Chart, Kent, was opened last week. It is built of red brick with corrugated iron roof, and measures 40ft. by 20ft. internally. Mr. A. J. Burrows, of Pluckley, acted as honorary architect, and Mr. C. Freed, of Little Chart, was the builder.

The work by Cornelius S. Bega, "The Philosopher," recently presented to the National Gallery collection, as already mentioned by us, has been hung during the week on a screen in Room No. XII. It is numbered 1481.

Two hotels at Newcastle-on-Tyne, the Benwell and the Grand, are about to be remodelled and rebuilt from plans by Messrs. Oliver and Leeson, of that city.

A new organ, built by Messrs. Brindley and Foster, of Sheffield, at a cost of £800, was opened at Govan Hill parish church on Christmas Eve. The outer case has been made by Messrs. Miller and Murray, of Glasgow, from designs by Mr. William Tennant, architect, also of Glasgow.

The annual meeting of the sick club at Messrs. Swaine Bourne and Son, artists in stained glass, King Edward's-road, Birmingham, and 163, Aldersgate-street, London, was held at the works last week, Mr. G. W. Hopton in the chair. The balance sheet submitted was in every respect very satisfactory. It shows the amount of £17 9s. 10d. available for dividend, after deducting £4 8s. 7d. sick pay and expenses on the year's accounts, and leaves a sinking fund of £8 6s. in hands of the treasurer. After the usual votes of thanks, &c., the following gentlemen were re-elected to office for the ensuing year:—Mr. Swaine Bourne, treasurer; Mr. W. J. Swan, secretary; and Messrs. Hillier, Jarvis, Lees, Roberts, Shaw, Smith, and Taylor, the committee. The club was formed in 1887, and has now upwards of twenty members.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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### ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—A. C.—J. F.—M. J. E.—A. S. R.—M. and C.—J. E. and Son.—A. P. D.—T. G. and Co.

## Correspondence.

### ST. CUTHBERT'S CHURCH, KENSINGTON.

To the Editor of the BUILDING NEWS.

SIR,—In the profession it is, I believe, tolerably well known that I am the architect of this church, and not Mr. Cyril Power, and such being the case I should have been content to treat the matter with silent contempt were it not for the fact that, to my knowledge, your journal circulates largely amongst the clergy and others outside the profession, who may not know who the architect is—indeed, many of my friends have asked me for an explanation of the illustration which appeared in your issue of Dec. 18, and of two other drawings bearing Mr. Power's name, and illustrated on November 27 and December 25, in which the letterpress description of his designs implies that they are to be carried out—e.g., on Nov. 27, regarding an organ-case, he says "the carving is to be chiefly executed by the carving guild in connection with the church"; and, again, "the console is to be located, &c." and "the woodwork is to be dark oak; and on Dec. 25, regarding his scheme for raising the walls and groining the roof (for which the church was not intended), he says "it shows the entire scheme for the decoration of the church." Now, most people would, on reading these notices, suppose that something more was meant than that the gentleman concerned had occupied himself in preparing gratuitously, without any instructions from the vicar or committee, various designs for the completion of a church of which the architect was not only living, but at the time, and for 12 or more years past, actively engaged upon the building, and of others connected with it, notably

the new parish hall recently completed, and the choir stalls, half of which were put in the church on Christmas Eve. I think Mr. Power may dismiss from his mind any hope of his suggestions being carried out; but I am pleased to see that he shows a considerable amount of ability as a draughtsman, and I will not, therefore, be unkind enough to criticise his designs; but I do object to his advertising himself as architect of St. Cuthbert's; and if he will take a little friendly advice from me, it will be that, in his next attempt at notoriety, he will select some church to try "his 'prentice hand on" where the architect has gone to his rest, or, at least, where he has failed to satisfy those who have intrusted him for many years with their work, and whom he has yet to learn that he has in any way failed to satisfy. I trust that nothing but death—nay, not even this itself—will ever sever my connection with St. Cuthbert's, upon which I have spent some of the best years of my life in a work in which I have ever taken the greatest pride and interest, and during the progress of which I have made many very sincere friends, with whom it has been a pleasure to work.—I am, &c.,

HUGH ROUMIEU GOUGH.

Ravenscourt Park, W., Dec. 28.

### BELFAST CITY HALL.

SIR,—One cannot relish the idea, I am afraid, that, after spending a large amount of time, energy, and, last—but by no means least—money upon the above competition, the whole of such effort should be absolutely wasted by the caprice of either committee or assessors!

I apprehend there can be no two honest opinions as to the "unmitigated jobbery" in connection with this competition, when it is remembered that the competitors who carried out the conditions most exactly were the first to be disqualified! Yet such is the indubitable fact.

Your correspondents "City Hall" and Mr. Lockwood (Belfast) have both written very pointedly upon the case, and deserve the thanks of all those competitors who complied with the "particulars" issued to them.

There are evidently many most unsatisfactory elements connected with the competition, some of which are pointed out by Councillor Woodside in his speech (as reported in the *Belfast News-Letter*) at the council meeting, held early in December. He stated that "the majority of the corporation thought that in their opinion the assessors had overlooked the fact that the instructions to the architects contained a clause suggesting that the proposed new town hall should have a large hall in it suitable for public functions. In the three plans selected this hall had been left out entirely." The italics are mine. Councillor Young said that "the others"—i.e., the selected designs—"as they knew, exceeded the sum mentioned in the conditions." The Lord Mayor, to further confuse confusion, said (not once, but twice) that there were three assessors. Who was the third?

Personally, I think the competitors are entitled to an explanation from the assessors as to what caused them to commit a breach of trust—that trust reposed in them implicitly by the competitors—it being evident that (firstly) none of three premiated designs comply with the condition as to the central hall; and (secondly) that none of them can be executed for the £150,000 stipulated.

Not having been anxious to take the initiative myself, I have been waiting patiently for the matter to be taken up in a practical form by competitors more able than I am; but as there appears to be some superabundance of diffidence, I needs must. May I, therefore, ask those competitors whose designs, like mine, showed the central hall arrangement, to communicate their names and addresses to me, so that the glaring injustice to competitors may be properly put before the council and the public generally. I shall be very willing to bear my portion of the expenses incurred.—I am, &c.,

S. HENRY EACHUS.

Lichfield-street, Wolverhampton.

### ADAPTABLE SPECIFICATIONS.

SIR,—As a means of preventing, and ascertaining whether obliquities such as those mentioned in, and to be inferred from, the article under the above heading in your issue of last week, have any existence—in fact, the proper course, it seems to me—would be the insertion in the specification of a clause empowering the clerk of works to have portions of the work in progress examined



from time to time, and if found defective, the cost of examination to be borne by the contractor, but if otherwise by the client. The existence of such a clause, always liable to be put into practice, would, I am sure, act as a powerful deterrent to obliquities such as those mentioned in your article.

The detection of imperfectly-burnt perishable bricks is always a matter of experience. Imperfectly-burnt perishable "bricks of the Midland ('ounties)" may be detected generally by their pale tint and comparative porosity. The failure to "weather" in some of these bricks is, in nearly all cases, due to insufficient firing. A good plan is to select a sample brick of a well, though not over, fired tint, contracting with the brick-maker to supply bricks of that quality. I have known this to be done on a building costing £84,000.—I am, &c., F. W.

## Intercommunication.

### QUESTIONS.

[11599.] **Cash-Carrier**.—I should be much obliged if any reader could inform me if there is any reliable pneumatic or other cash-carrier system suitable for a large retail establishment which could be substituted for the cash-railways now in use, but which are greatly in the way, as well as being unsightly.—DUBLIN.

[11600.] **Tunnels**.—What method is adopted in laying out railway tunnels on curves, say similar to those of the St. Gothard and Mont Cenis Railways? The tunnels are practically spiral or corkscrew. There may be a rise of 500ft., with a horizontal distance as the crow flies of perhaps only 10,000ft., which, with the distance gained by each tunnel, would be about 20,000ft. or more. How is the divergence done? Is the bearing altered from day to day, or is there a trammel? and if so, of what kind?—STUDENT.

### CHIPS.

The urban district council of Leigh, Lancs, received, on Tuesday, the resignation of office, owing to ill-health, of Mr. G. Dickinson, who has been their surveyor for the past thirty-three years.

A Wesleyan chapel at Ryhill, near Stanford, was reopened last week after renovation and the addition of new school and classrooms. Messrs. Hinson Brothers, of Stanford, were the builders, and also provided the plans.

A Local Government Board inquiry has been held at Barking by Colonel C. H. Luard, R.E., with reference to an application by the urban district council to borrow £5,000 for laying-out the recreation ground.

The London show-rooms of Messrs. Barnard, Bishop, and Barnards, Ltd., are removed to 23, Princes-street, Cavendish-square, W., where examples of all their newest designs in stoves, mantels, tiled slabs, &c., will be found.

The Safety Tread Syndicate, Ltd., has received the order for the supply of Mason's patent treads to the "Tower" at New Brighton.

Nearly a million sterling is to be spent in increasing the dock accommodation at Antwerp, the Belgian Minister of Public Works having decided to extend the quays 3,000ft. to the south, at a cost of four million francs. A channel 200ft. wide and 24ft. deep is to be constructed. The work is to be carried out by contract, the specifications not only defining a minimum wage for the workmen, but requiring that they shall be insured, and that measures shall be taken for their safety. The works are part of a scheme for a still greater extension of the port, surveys having been made further down the Scheldt.

The memorial stone of a new Episcopal church now being erected in Auchterarder, called St. Kessog's, was laid on Tuesday by Bishop Chinnery-Haldane, of Argyll and the Isles. The church is being erected by Mr. Walter E. T. S. Reid, and is situated in a field on the north side of the High-street, and about 600 yards distant from the ruins of Auchterarder Castle, the hunting seat of Malcolm Canmore and the "Good Queen Margaret." The church is Early Decorated in style, and consists of a nave 48ft. by 24ft. and a chancel 26ft. by 24ft.

The Bournemouth Corporation appear at last to be earnestly taking into consideration the question of an undercliff drive and the preservation of the cliffs in the Bournemouth Bay, and at their meeting on Dec. 30 instructed Mr. F. W. Lacey, their borough engineer, to be prepared with full particulars of his scheme. Mr. Lacey estimates the cost at about £60,000.

A mission-hall at Ryton, near Conover, Salop, was opened last week. It is built of local brick-work, and accommodates about 100 persons. Mr. J. Nurse, of Shrewsbury, was the architect, and Mr. John Price, of Bayston Hill, the builder.

## Our Office Table.

It is satisfactory to see that, notwithstanding the clamour raised by irresponsible amateurs, most of whom have not even inspected the cathedral, the Dean and Chapter of Peterborough remain firm in their decision to accept the advice given them by their architect, Mr. Pearson, endorsed as it is at every point by Sir Arthur Blomfield, and backed up by their builder, Mr. Thompson, whose practical experience as a church restorer is unparalleled by any other contractor in the kingdom. On Tuesday the Dean and Chapter of Peterborough held a meeting, at which a further letter was read from the Society of Antiquaries, requesting permission for its representatives to make a further examination of the west front of the cathedral, and to make notes and measurements for the purpose of preparing a specification for the repair of the northern gable on the plan advocated by the society. It was resolved that the Dean and Chapter regret that they are unable to accede to the request, as they consider that to grant it would have a significance, under present circumstances, which did not attach to compliance with similar requests on former occasions. They feel that they would only be misleading the society if they consented to an examination preparatory to a course of action which they have definitely decided not to adopt. No more absurd plan than the suggestion made by certain members of the Society of Antiquaries to grout in the piers from the rear could well be desired. The merest tiro in building matters is aware that surfaces intended to be grouted must be cleansed from all dust and saturated with water before the liquid mortar can be applied, and it is needless to suggest what would be the result of such treatment to isolated piers and gabled fronts in so admittedly shaky a state as those at Peterborough.

The extraordinary activity of all branches of the building trade in Manchester during the past twelve months cannot be paralleled, says the *Manchester Guardian*, by any more recent reference than one to the years 1876 and 1877, when many of the suburbs round the city may be said to have had their birth. In the city several very large structures have been completed and others begun, while a considerable quantity of rebuilding of warehouses, offices, and shops have been in progress. In the suburbs, the designs even of the cheapest classes of cottage property show in many cases considerable improvement upon the styles that have been too long in vogue. Thousands of new houses have sprung up, built to let at rents usually ranging from 5s. 6d. to 7s. 6d. per week. Labour has been abundant all the year. Bricklayers have been better paid, and plasterers, whose numbers are, by the rules of their society, strictly limited, have often been in urgent request. The demand for such favourite materials as Ruabon bricks has not slackened, in spite of the production of large quantities of imitations. There is every appearance of continued prosperity throughout the building industries in Manchester.

MR. HARRY HEMS gave on Christmas Day his 28th annual feast to the aged poor of Exeter, at his Luckie Horseshoe studios in Longbrook-street, in the "ever-faithful city." The old people numbered over seventy, and grace having been said by the Rev. S. W. E. Bird, M.A., Rector of St. Sidwell's, everybody fell-to with a will, Mr. Bird acting as chief butler. The bear's head, brought from the Black Forest, and weighing 26lb., wore a garland of rosemary, and occupied the place of honour. The beef and other joints were done full justice to, washed down by plenty of Burton beer. Roast geese followed, and then came plum puddings and mince pies. The large studio, in which the dinner took place, was decorated with flags, evergreens, and Japanese lanterns, whilst ashens faggots cracked on the hearth. During dinner instrumental music was provided by the host's daughters, Mrs. George Packham and the Misses Hems, who did yeoman service in the musical line until the night was far spent. Soon after dinner the Lord Bishop of Exeter and party arrived from the palace, and soon afterwards the Mayor and Mayoress of Exeter (Alderman and Mrs. Pople) followed, as well as the Under-Sheriff and other friends. It was now that the family punch-bowls and long pipes were introduced, and the loving cup—a trophy of the host's early deeds in the athletic line—went its course around.

The Bishop's health having been cordially drunk by all present, in eloquent and affectionate terms his Lordship addressed the company. The Mayor and other friends also spoke, and afterwards a magic-lantern display, songs, and dancing varied the evening's enjoyment. On the following evening a similar treat was given to the girls of St. Martha's Orphanage and other children.

### MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—Architectural Association of Ireland. "The Architecture of Dublin," by Thomas Drew, R.H.A., 22, Clare-street, Dublin. 8 p.m.

On Christmas Eve a new four-dial illuminated turret striking clock was set in motion at the district council offices, Meltham, Yorks. The work has been done by Messrs. W. Potts and Sons, clock manufacturers, of Leeds and Newcastle, from instructions received from the architect, Mr. Wm. Carter, of Meltham, who designed the hands and dials.

New premises have been built for the Elswick branch of the North-Eastern Banking Company in Scotswood-road, Newcastle, comprising banking-room, manager's room, and safes on the ground floor, with offices and caretaker's rooms on the upper floor. This building is of Classic design, the interior finishings being of polished teak, the contractor being Mr. G. H. Mauchlen, who carried out the design of Mr. William Lister Newcombe, F.R.I.B.A., Newcastle.

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## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Roller-Iron Joists, Belgian .....	£5 5 0 to	£6 0 0
Roller-Iron Joists, English .....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates .....	6 15 0 "	"
Bar Iron, good Stuffs .....	7 0 0 "	7 5 0
Do., Lowmoor, Flat, Round, or Square .....	17 0 0 "	17 10 0
Do., Welsh .....	5 15 0 "	5 17 6

## Boiler Plates, Iron—

South Staffs .....	7 16 0 "	8 0 0
Best Snedshill .....	9 0 0 "	"
Angles 10s., Tees 20s. per ton extra.		

Builders' Hoop Iron, for bonding, &amp;c., £6 10s. 0d. per ton.

Builders' Hoop Iron, galvanised, £13 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron

No. 18 to 20. No. 22 to 24.	Per ton.	Per ton.
6ft. to 8ft. long, inclusive gauge .....	£10 15 0 "	£11 0 0
Best ditto .....	11 5 0 "	11 10 0

Cast-Iron Columns .....

Cast-Iron Stanchions .....

Cast-Iron Sash Weights .....

Cast-Iron Socket Pipes—

3in. diameter .....

4in. to 6in. .....

7in. to 24in. (all sizes) .....

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 6s. per ton extra.]

Pig Iron—

Cold Blast, Lilleshall .....

Hot Blast, ditto .....

Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

Gas-Tubes .....

Steam-Tubes .....

Galvanised Gas-Tubes .....

Galvanised Water-Tubes .....

Galvanised Steam-Tubes .....

10cwt. casks. 5cwt. casks.

Sheet Zinc, for roofing and work-

ing up .....

Sheet Lead, 3lb. per sq. ft. super. .....

Pig Lead, in 1cwt. pigs .....

Lead Shot, in 28lb. bags .....

Copper Sheets, sheathing and rods .....

Copper, British Cake and Ingot .....

Tin, Straits .....

Do., English Ingots .....

Spelter, Silesian .....

Cut Clasp Nails, 3in. to 6in. ....

Cut Floor Brads .....

Wire Nails (Points de Paris)—

0 to 7 8 9 10 11 12 13 14 15 B.W.G.

8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/3 16/3 per cwt.

## TIMBER.

Teak .....

Quebec pine, red .....

" yellow .....

" pitch .....

" Oak .....

" Birch .....

" Elm .....

" Ash .....

Dantisc and Memel Oak .....

Fir .....

Wainscot, Riga p. log .....

Lath, Dantisc, p.f. ....

St. Petersburg .....

Greenheart .....

Sequoia, U.S.A. ... per cube foot

Mahogany, Cuba .....

" Honduras .....

Cedar, Cuba .....

" Honduras .....

Walnut, Italian .....

Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2in.

by 1 1/2in. :—

Quebec, Pine, 1st .....

" 2nd .....

" 3rd .....

Canada Spruce, 1st .....

" 2nd and 3rd .....

New Brunswick .....

Riga .....

St. Petersburg .....

Swedish .....

Finland .....

White Sea .....

Baltens, all sorts .....

Flooring Boards, per square of 1in. :—

1st prepared .....

2nd ditto .....

Other qualities .....

Staves, per standard M. :—

Quebec pipe .....

U.S. ditto .....

Memel, cr. pipe .....

Memel, brack .....

## OILS.

Linseed .....

Rapeseed, English pale .....

Do., brown .....

Cottonseed ref. ....

Olive, Spanish .....

Seal, pale .....

Cocoonut, Cochín .....

Do., Ceylon .....

Palm, Lagos .....

Oleine .....

Lubricating U.S. .... per gal.

Do., black .....

Tar, Stockholm .....

Archangel .....

Turpentine, American ... per ton

## TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BELFAST.—For supplying 30 suites of furniture for the workhouse infirmary, for the board of guardians:—  
Divided between Mitchell, A., and Co., of North-street, and Todd, W. A., Victoria-street, both in Belfast.

BEXHILL.—For the erection of house and shop in Devonshire-road, Bexhill, for Mr. F. J. Parsons, Hastings. Mr. A. C. D. Hicks, Sea-road, Bexhill, architect:—  
Gold, C. H., Bexhill (accepted) ... £1,545 0 0

BEXHILL.—For the erection of three houses and shops, St. Leonard's-road, Bexhill, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, Sea-road, Bexhill, architect:—

Lester, J., Hastings .....	£3,797 0 0
Hurrell, C. W. P., St. Leonard's .....	3,749 0 0
Edridge & Cruttenden, St. Leonard's .....	3,737 0 0
Moon and Garner, Hastings .....	3,720 0 0
Cruttenden, H. E., St. Leonard's .....	3,717 0 0
Jenkins, P., St. Leonard's .....	3,499 0 0
White, A. H., St. Leonard's .....	3,390 0 0
Gold, C. H., Bexhill (accepted) .....	2,710 0 0

BEXHILL.—For the erection of house and shop, corner of Wilton and St. Leonard's-roads, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, Sea-road, Bexhill, architect:—

Padgham and Hutchinson, St. Leonard's .....	£1,212 10 0
Cruttenden, H. E., St. Leonard's .....	1,193 0 0
White, A. H., St. Leonard's .....	1,177 11 0
Thomas, C., Bexhill .....	1,031 0 0
Dexter, T. W., Bexhill (accepted) .....	967 0 0

BEXHILL.—For the construction of sewer, &c., n. and making-up, Jameson-road, Sea-road Building, Estate, Bexhill, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, Bexhill, surveyor:—

Cruttenden, H. E., St. Leonard's .....	£1,445 0 0
Hudson, W., Brighton .....	1,434 0 0
Piper, W., Hastings .....	1,375 0 0
Guttsell, E., St. Leonard's .....	1,307 0 0
Webb, J. W., Bexhill .....	1,133 0 0
Carey, S., Bexhill (accepted) .....	1,091 10 0

BRIXTON.—For heating at the Brixton Hill School, for the London School Board:—

Harlow, B., and Son .....	£927 0 0
Comyn Ching and Co. ....	57 18 0
Grundy, J. ....	510 0 0
Richardson, W., and Co. ....	480 0 0
Fraser, J., and Son .....	463 0 0
Duffield and Co. ....	456 0 0
Christie, J. C. ....	441 10 0

\* Recommended for acceptance.

BROMSGROVE.—For draining the village of Webbeath, for the Bromsgrove Rural District Council:—  
Law, H., Erdington (accepted) ... £553 0 0

DENBIGH.—For North Wales Counties Lunatic Asylum. Messrs. C. O. Ellison and Son, 22, Sir Thomas-street, Liverpool, architects. Quantities by the architects:—

Henshaw, J., and Sons, Liverpool .....	£62,319 0 0
Jones and Sons, Liverpool (exclusive of addenda) .....	57,000 0 0
Webster, S., Bootle .....	57,890 0 0
Parnell, J., and Son, Rugby .....	56,859 0 0
Willcock, H., & Co., Wolverhampton .....	53,435 0 0
Warburton, S., Miles Platting, Manchester (accepted) .....	50,382 0 0

[Architect's estimate (exclusive of addenda), £49,800.]

GOURCOCK, N.B.—For the erection of a detached villa in Barrhill-road, for Commissioner James Murray:—

Accepted tenders:—  
Mason:—Steel, W., Gourcock and Greenock.  
Joiners:—Smith and McCuaig, Greenock.  
Slater:—Stevenson, G. McC., Gourcock.  
Plumber:—Fairgrieve and Son, Gourcock and Greenock.  
Plasterers:—Slaven, M., Gourcock.

GRAYS, ESSEX.—For heating the Shifeshire Training Ship, for the London School Board:—

Wontner-Smith, J., Gray, and Co. ....	£438 17 0
May, J., and F. ....	390 0 0
Cannon, W. G., and Sons .....	250 0 0
Vaughan and Brown, Limited .....	247 0 0
Clarke, J. F., and Sons .....	234 0 0
Wenham and Waters, Limited .....	208 0 0
Ellis, J. C. and J. S., Limited .....	195 0 0
Duffield and Co. ....	194 0 0
Biggs, J. (accepted) .....	176 8 0

HAMPSHIRE.—For alterations and additions to "Lang-wathby," Belsize-lane, Hampstead, for Mr. A. R. Bax, E.S.A. Mr. J. William Stevens, 21, New Bridge-street, City, E.C., architect:—

Wheeler, E. ....	£1,274 0 0
Hudson, W. ....	1,190 0 0
Pease, W. ....	1,121 10 0
Brown, A. J. ....	1,100 0 0
Pease and Kentish .....	1,050 0 0
Thompson, W. (accepted) .....	1,017 0 0

ISLINGTON, W.—For engineering work for the new women's swimming-bath and additions to the public washhouse, Caledonian-road Baths, for the vestry of St. Mary, Islington. Mr. A. Hessel Tiltman, F.R.I.B.A., 6, John-street, Bedford-row, London, W.C., architect:—

Cudlipp and Co. ....	£1,567 7 9
New and Mayne .....	4,425 0 0
Potter and Sons .....	4,245 0 0
Summerscales .....	4,130 0 0
Russell and Co. ....	3,847 0 0
Fraser and Fraser .....	3,429 0 0
May Bros. ....	3,400 0 0
Fraser, W. J., and Co. ....	3,300 0 0
Bradford and Co. ....	3,159 0 0
Clarke and Sons .....	3,152 0 0
Purcell and Nobbs .....	2,943 0 0
Sugg .....	2,914 0 0
Moorwood and Sons (accepted) .....	2,571 15 0

IPSWICH.—For building a new chapel on the Wood-bridge-road and Argyle-street, Ipswich, on the site of an existing iron chapel, for the trustees of the Free Methodist Church. Mr. George Wm. Leighton, 6, Princes-street, Ipswich, and Felixstowe, architect:—  
A. B.  
Graydon, W. .... £3,843 £15 £50  
Death, M. .... 3,750 50 100  
Girling, R. .... 3,631 60 123  
Roper, C. .... 3,559 — 10  
Bennett, F. .... 3,570 60 40  
Youngs and Son, Norwich .....

3,395 — 10  
Daws and Son, Norwich .....

3,348 10 15  
Collins & Barber, Downham Market, 3,220 33 80  
A.—Pull down and credit. B.—Credit for iron buildings.

KENNINGTON.—For plant and works at the public baths and washhouses, Kennington-road, for the Commissioners of Baths and Washhouses for Lambeth. Mr. A. Hessel Tiltman, F.R.I.B.A., 6, John-street, Bedford-row, London, W.C., architect:—

General engineering work:—		
Summerscales and Sons .....	£8,240 0 0	
Berry and Sons .....	7,996 0 0	
May, J. and F. ....	6,490 0 0	
Three Lancashire boilers:—		
Fraser, J., and Sons .....	1,934 0 0	
Yates and Thorn .....	1,950 0 0	
Leeds and Bradford Boiler Co. ....	1,860 0 0	
Anderton and Son .....	1,850 0 0	
Taylor and Sons (accepted) .....	1,725 0 0	

LONDON, S.E.—For heating at the East-lane School, for the London School Board:—

Whippell Bros. and Row .....	£225 0 0
Cannon, W. G., and Sons .....	148 0 0
Davis, G. ....	136 0 0
Grundy, J. ....	105 0 0

\* Recommended for acceptance.

LONDON, N.W.—For staircase, &c., at the "Brecknock" School, for the London School Board:—

Dearing, C., and Son .....	£137 0 0	£134 0 0
Cruwys, T. ....	136 15 0	134 9 0
Stevens Bros. ....	133 8 0	130 18 0
Grover, J., and Son .....	132 0 0	132 0 0
McCormick and Sons .....	124 12 0	121 0 0
Williams, G. S. S., and Son .....	115 0 0	112 0 0
Britton, F. ....	110 0 0	110 0 0

A.—If "Victoria Stone" be used. B.—If "Hobman's Stone" be used.

LONDON.—For heating at the Swaffield-road School, for the London School Board:—

Maguire and Son .....	£748 16 0
Strode and Co. ....	667 0 0
Ellis, J. C. and J. S., Ltd. ....	659 0 0
Cannon, W. G., and Sons .....	633 0 0
Whippell Bros. and Row .....	486 10 0
Christie, J. C. ....	472 10 0
Dougill, A., and Co., Ltd. ....	445 0 0

\* Recommended for acceptance.

LONDON.—For refitting and reconstructing offices, and providing new drainage scheme at Wolverly-street School, for the London School Board:—

Goad, W. V. ....	£1,888 0 0
Minter, F. G. ....	1,878 0 0
Shurmer, W. ....	1,870 0 0
Grover, J., and Son .....	1,820 0 0
Parker, G. ....	1,760 0 0
Lawrance, E., and Sons .....	1,735 0 0
Triggs, E. ....	1,616 0 0
Williams, G. S. S., and Son .....	1,513 0 0
Akers, W., and Co. ....	1,507 0 0

\* Recommended for acceptance.

LONDON.—For heating school in Keeton's-road, for the London School Board:—

Tabor and Hinchcliffe .....	£199 0 0
Kinnell, C. P., and Co. ....	185 0 0
Hill and Drummond .....	179 10 0
May, J. and F. ....	165 0 0
Duffield and Co. ....	163 0 0
Ellis, J. C. and J. S., Ltd. ....	137 10 0
Wontner-Smith, J., Gray, and Co. ....	131 10 0

\* Recommended for acceptance.

LONDON.—For heating Eleanor-road School, for the London School Board:—

Ellis, J. C. and J. S., Ltd. ....	£559 0 0
Vaughan and Brown, Ltd. ....	538 0 0
May, J. and F. ....	520 0 0
Clarke, J. F., and Sons .....	453 0 0
Defries, J., and Sons, Ltd. ....	409 0 0
Dougill, A., and Co., Ltd. ....	405 0 0

\* Recommended for acceptance.

LONDON.—For heating Conway-road School, for the London School Board:—

Davis, G. ....	£689 0 0
Comyn, Ching, and Co. ....	679 10 0
Price, H. C., Lea, and Co. ....	629 0 0
Ellis, J. C. and J. S., Ltd. ....	599 0 0
May, J. and F. ....	595 0 0
Vaughan and Brown, Ltd. ....	593 0 0
Richardson, W., and Co. ....	572 0 0
Grundy, J. ....	546 0 0

\* Recommended for acceptance.

LONDON, E.—For heating Millwall School, for the London School Board:—

Milan, F. ....	£840 0 0
Oldroyd, E., and Co., Ltd. ....	675 0 0
Cameron, W. G., and Sons .....	579 0 0
Grundy, J. ....	528 0 0
Vaughan and Brown .....	511 0 0
Kallaway, A. J., and Co. ....	497 0 0
Richardson, W., and Co. ....	469 0 0
Whippell Bros. and Row .....	425 0 0
Fraser, J., and Son .....	418 0 0

\* Recommended for acceptance.

(Continued on page 50.)



## LIST OF COMPETITIONS OPEN.

Colwyn Bay Electricity Lighting Scheme	£30 (merged in commission), £20	Jas. Porter, Clerk, Urban District Council, Colwyn Bay	Jan. 12
Wood Green, Tottenham—Higher Grade Schools (90 places)	No premium; 3 per cent. commission	J. F. Adams, Clerk to Tottenham School Board, Offices, Tottenham	15
Sunderland Technical School (£18,000 limit of cost)	£100, £50, £25	Erna M. Bowey, Town Clerk, Sunderland	16
Colham, Surrey—Sewerage and Sewage Disposal Schemes	25gs. (to merge in commission)	W. O. Reader, Clerk, Epsom R.D.C., Lonsdale, Epsom	16
Morley Public Baths	£3 (merged) and £15	R. Borough Hopkins, Town Clerk, Morley	25
Sutton St. Edmund School (100 places, £900)	No premium; 5 per cent., inc. com.	R. P. Mossop, Clerk to Sutton School Board, Holford	31
Worcester Corporation—Sewage Disposal	£160 and two lesser premiums	Samuel Southall, City Clerk, Worcester	31
St. Gilles, near Brussels—Town Hall (£12,000 limit of cost)	£10	Municipal Authority, St. Gilles, Belgium	Feb. 1
Building Trades Exhibition Poster	£50, £30	The Manager, 43, Essex-street, W.C.	1
Dudley Grammar School and Master's House	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s.	Albert Morton, Clerk to Governors, 15, Birmingham-road, Dudley	15
Christiana—Railway Terminal Station Plans	No premium	Railway Offices, 6, Victoria-terrace, Christiania	Mar. 31
Osgodby, Lincolnshire—Wesleyan Chapel & Schools (cost £630)	£20, £10	E. H. Davy, Secretary to Trustees, Kirkley, Market Rasen	—
Eccleshill, Bradford—Sewage Disposal	£15	Jos. Richardson, Clerk, U.D.C., 4, Town Hall-square, Bradford	—
Spalding—Extending Corn Exchange (£3,000 to £5,000 probable cost)	£150, in three premiums	The Clerk to Urban District Council, Spalding	—
London—Electric Omnibus and Cab Designs	£150 and £75	Sec., London Electric Omnibus Co., 6, Northumberland-av., W.C.	—
Auckland, New Zealand—Stock Exchange, Queen-street	£20, £10, £5	R. E. Isaacs, Secretary, 29, N.Z. Insurance Buildings, Auckland, N.Z.	—
Teddington—House Plans, Broom Water Estate		F. J. C. Hill, London Brick Co., 7, Archway-road, Upper Holloway	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Sutton Bridge—Station Buildings	Midland and Gt. Northern Railways	The Secretary to Joint Committee, Midland Offices, Derby	Jan. 2
Derby—Premises, East-street	Midland Drapery Co.	Coulthurst and Booty, Architects, 4, Albert-street, Derby	2
Colchester—Enlarging Boiler House, Workhouse	Board of Guardians	G. H. Page, Architect, Trinity Chambers, Colchester	4
Tange, Leicester—Two Highway Bridges	Leicestershire County Council	W. B. Smith, County Surveyor, 7, Friar-lane, Leicester	4
Alverthorpe, Wakefield—Extension of Weaving Shed	Colbeck Brothers	Nelson and Savage, Architects, 15, Park-row, Leeds	4
Weston-super-Mare—Market House, Dwellings, and Shops	Newark Charity Trustees	Hans Price and Wooler, Architects, Weston-super-Mare	4
Whitehead, Co. Antrim—School	Bristol Docks Committee	N. Fitzsimons, Architect, 82, Royal-avenue, Belfast	4
Newark—New Buildings, North Markham Farm	Corporation	F. B. Footitt, Clerk, Newark-on-Trent	4
Hilfrcombe—New Premises, Fore-street	Town Commissioners	G. C. Smyth-Richards, Surveyor, Barnstaple	4
Avonmouth—Cold Stores (150ft. by 90ft.)	Pier Commissioners	The Secretary, 19, Queen-square, Bristol	4
Birkenhead—Alteration, Public Baths, Argyle-street	Corporation	A. Gill, Town Clerk, Birkenhead	4
Baildon—Two Semi-detached Houses, Trench Wood	H.M. Commissioners of Works	Chas. E. Marsden, Architect, 3, John-street, Bradford	4
Blackrock—Fifteen Dwellings, Temple-road	Committee	R. F. Heron, Secretary, Town Hall, Blackrock	5
Dunoon, N.B.—Waiting Rooms and Offices	School Board	J. Valrose Cler, Town Clerk, Dunoon	5
Glasgow—Drying Houses at Sewage Purification Works	Official	J. Lindsey, Interim Clerk, City Chambers, Glasgow	6
Pellon, Halifax—Twelve Houses	Rev. T. A. McCready, Hincley	Medley Hall, Architect, 29, Northgate, Halifax	6
Cardiff—Custom House	H.M. Commissioners of Works	Hon. Reginald B. Brett, Secretary, 12, Whitehall-place, S.W.	6
Stockport—Industrial School, Offerton-lane	Committee	T. H. Allen, Architect, 39, St. Peter's Gate, Stockport	6
Bolton-on-Deane—Schools and House, Goldthorpe-lane	School Board	H. L. Tacon, Architect, 11, Westgate, Rotherham	6
Falkenberg—Railway Goods Shed	Official	Railway Inspector's Office, Dessau, Germany	7
Barwell, Hincley—Primitive Methodist Schools	Rev. T. A. McCready, Hincley	Geo. Punshon, Architect, Barwell, Leicestershire	7
Idle, Yorks—Independent Schools	H.M. Commissioners of Works	W. and J. B. Bailey, 9, Market-street, Bradford	7
Derby—Rebuilding Midland-road Branch Post-Office	Newcastle School Board	Hon. Reginald B. Brett, Secretary, 12, Whitehall-place, S.W.	8
Byker-on-Tyne—Victoria Jubilee School	H. Richmond	Chas. Waller, Architect, 26, Eldon-square, Newcastle	8
Maryport—Two Shops	Restoration Committee	C. Eaglesfield, Architect, Maryport	8
Halifax—Additions to Trinity School	Restoration Committee	Jackson and Fox, Architect, 22, George-street, Halifax	8
Exeter—Demolition of St. David's Church	Restoration Committee	Rev. C. J. V. French, St. David's Vicarage, Exeter	9
Exeter—Rebuilding St. David's Church	Restoration Committee	W. D. Caru, F.S.A., F.R.I.B.A., 8a, Whitehall-place, S.W.	9
Thornbury—Cemetery Chapel	Restoration Committee	S. Fudge, Architect, Thornbury, Glos.	9
Bury, Lancs.—Baptist Chapel and School, Manchester-road	Restoration Committee	Thos. Nuttall, Architect, 20, Market-street, Bury	11
Leicester—Branch Free Library, Belgrave-road	Restoration Committee	A. H. Hind, A.R.I.B.A., 3, Greyfriars, Leicester	11
Aberystwith—University College Superstructure	Restoration Committee	Chas. F. Ferguson, Architect, 42, Clareville-road, S. Kensington	12
Liverpool—Railway Goods Warehouse	Restoration Committee	Oliver S. Holt, Secretary, London Road Station, Manchester	12
Norwich—Converting Old Museum into Public Baths	Restoration Committee	Geo. B. Kennett, Town Clerk, Guildhall, Norwich	12
Cockermouth—Bank Premises	Restoration Committee	G. Dale Oliver, F.R.I.B.A., Carlisle	13
Bradley, Yorks—Primitive Methodist Chapel	Restoration Committee	Jas. Hartley, Architect, Exchange-buildings, Skipton	13
Wimbleton—Five Cottages, Hubert-road	Restoration Committee	Wm. Cooper, M.S.A., 21, Havelock-road, Hastings	14
Christchurch—Water Tower at Southbourne	Restoration Committee	S. Newlyn, Secretary, Stour-road, Christchurch, Hants	14
Broad Hamston—Church Roof Restoration	Restoration Committee	Edmund Sedding, Architect, 12, Atheneum-street, Bristol	16
Morley—Bank Premises	Restoration Committee	Wm. Bakewell, F.R.I.B.A., 23, Park-square, Leeds	16
Alnwick—Choir Vestry at St. Paul's Church	Restoration Committee	Forster and Paynter, Solicitors, Fenkle-street, Alnwick	16
Bedding—Infants' School	Restoration Committee	James and Morgan, Architects, Charles-street Chambers, Cardiff	18
Birkenhead—Pavilion at Fever Hospital, Playbrick-hill	Restoration Committee	Alfred Gill, Town Clerk, Birkenhead	18
Pontypool—Shops and Offices, Crane-street	Restoration Committee	Robert Williams, Architect, Osborne Chambers, Pontypool	18
Burnham-on-Crouch—Schools	Restoration Committee	Fred. Chancellor, F.R.I.B.A., Chelmsford	18
Harwich—Coastguard Station Repairs	Restoration Committee	Director of Works, 21, Craven-street, W.C.	19
Dengemarsch, by Dungeness—Officers' House, Coastguard Station	Restoration Committee	Director of Admiralty Works, 21, Craven-street, W.C.	22
North Shields—Coach-lane Schools	Restoration Committee	Marshall and Dirk, Architects, 4, Northumberland-st., Newcastle	22
Winchester—Converting Prefab House into Judge's Lodgings	Restoration Committee	Fred. K. Bowker, Chapter Clerk, Winchester	25
Poplar, E.—Refuge Destructor, Cart Sheds, &c.	Restoration Committee	W. H. Fairfield, Clerk, 117, High-street, Poplar	25
Stratford, E.—Whalebone-lane Schools	Restoration Committee	C. W. Carrell, Clerk, Broadway, Stratford	26
Winchfield—Additional Vagrant Wards, Union House	Restoration Committee	F. S. Chandler, Clerk, Odiham, Hants	26
Cairo—Arabie Museum and Khedival Library	Restoration Committee	Office, Ministry of Public Works, Cairo	Feb. 1
Building Contracts in Four to Six Lots (£150,000)	Restoration Committee	Owners, The Firs, Sydenham Hill, S.E.	29
Felixstowe—Two 12-roomed Houses	Restoration Committee	E. J. Sherman, Rookburn, Felixstowe	—
Buxton—House	Restoration Committee	Sugden and Son, Architects, Leek and Hanley	—
Bracknell, Berks.—Rebuilding two Shops and Houses	Restoration Committee	A. E. Sidford, M.S.A., 1, Wollingham	—
Stapleton—Caretaker's House and Cookery Room	Restoration Committee	A. Trew, M.S.A., Broad-street, Bristol	—
Kensal Green—School (1,270 places)	Restoration Committee	W. Vincent, Clerk, Dyne-road, Kilburn, N.W.	—
Armsley, Leeds—Six Through Houses, Bridge-street	Restoration Committee	Fenton Brothers, Gipton Wood, Leeds	—
Burton-on-Trent—Minister's House, Shobnall-street	Restoration Committee	C. F. Underhill, New-street, Burton-on-Trent	—
Cadoxton-Barry—Hotel, at Mount Pleasant	Restoration Committee	H. Tudor Thorneley, Architect, 104, St. Mary-street, Cardiff	—
Bracknell, Berks.—Two Houses and Shops	Restoration Committee	A. E. Sidford, Architect, Wokingham	—
Rochdale—Additional Story to Mill	Restoration Committee	Joseph Stott and Sons, Architects, Clegg-street, Oldham	—
Norden—Workshop and Showroom	Restoration Committee	J. W. Sutherland, Architect, Church View, Norden	—
Chiswick—Four Houses, Duke's-road	Restoration Committee	H. S. White, Architect, 318, High-road, Chiswick	—
Mendlesham Enlarging Endowed Schools	Restoration Committee	Geo. Barnes, Mendlesham, Suffolk	—
Ikley—Residence	Restoration Committee	Isitt, Adkin, and Hill, Architects, Presidential Buildings, Bradford	—
Folkestone Public Baths	Restoration Committee	Reginald Pope, Architects, Ashton-under-Lyne	—
Glossop—Branch Bank	Restoration Committee	J. Eaton and Hill, Architects, Presidential Buildings, Bradford	—
Greetland—Re-seating Wesleyan Chapel	Restoration Committee	Isitt, Adkin, and Hill, Architects, Presidential Buildings, Bradford	—
Whitefield, Lancs.—Detached House, Church-lane	Restoration Committee	J. Grindy and Sons, Architects, 12, Brazenose-street, Manchester	—
Pendleton—Construction of Bowling Green	Restoration Committee	John Holt, C.E., 6, St. Mary's Gate, Manchester	—
East Calder, N.B.—Cottage and Stable	Restoration Committee	Robert Tait, Erskine-place, Pumphorston, N.B.	—
Leeds—Eight Houses, Richmond Hill	Restoration Committee	Wm. Holdridge, 5, Upper Accommodation-road, Leeds	—
Leeds—House in Roundhay-road	Restoration Committee	J. C. Spivey, Architect, Old Park-road, Roundhay, Leeds	—
Tunbridge Wells—Houses in Vale Royal	Restoration Committee	H. H. & E. Cronk, Architects, 4, Mount Ephraim-rd., Tunbridge Wells	—
Thorndon, Suffolk—School at Kerrison Reformatory	Restoration Committee	E. Fearnly Bisshopp, Architect, Ipswich	—
Nottingham—Re-erection, Dunkirk School	Restoration Committee	A. N. Bromley, Architect, Queen-street, Nottingham	—
Kendal—Stables and Coachhouse at Highgate	Restoration Committee	John Hutton, M.S.A., Kendal	—
Peterborough—Two Houses, Broadway	Restoration Committee	William Boyer, M.S.A., 10a, Cowgate, Peterborough	—
Peterborough—75 Houses	Restoration Committee	F. H. Cooke, Surveyor, Priestgate, Peterborough	—
Dundee—Pearl Assurance Buildings	Restoration Committee	C. and L. Owen, Architects, 101, Commercial-street, Dunlee	—

## ENGINEERING.

Aucklingill, Wick—Concrete Pier	Caithness County Council	Jas. Deames, County Clerk, Thurso	Jan. 2
St. Martin's-in-Fields—Underground Conveniences	Vestry	G. W. Marnace, Clerk, Town Hall, Charing Cross-road	4
India—Workshop Machinery	Bengal & North-Western Hwy Co.	E. L. Marryat, 237, Gresham House, E.C.	4



## ENGINEERING—continued.

Richmond, Surrey—Waterworks Engines	Corporation	W. G. Peirce, C.E., Riverside, Richmond	Jan. 5
Middlewich—Brick Culvert (170in.yds., 9ft. diameter) and Settling Beds	Cheshire Alkali and Salt Co.	Reginald T. Worth, A.M.I.C.E., Kinderton-street, Middlewich	5
Edinburgh—C.I. Pipes (1,500 tons, 16in. to 4in.)	Water Trustees	W. Boyd, Clerk, Edinburgh	6
Wenlock—Sinking Well and Supplying C.I. Pipes	Corporation	G. C. Cooper, Town Clerk, Much Wenlock	6
Southend-on-Sea—Enlarging Conveniences on Royal Hill	Corporation	W. Gregson, Town Clerk, Southend-on-Sea	7
Ilkeston—Converting Retorts	Corporation	Wright Lissett, Town Clerk, Ilkeston	7
Chester-le-Street—Providing and Laying Cast-iron Pipes (1,700 yards, 8in.)	Rural District Council	D. Balfour, C.E., 3, St. Nicholas Buildings, Newcastle	7
Westport—Water-Pipes (three miles, 8in.)	Langport Rural District Council	E. G. Lough, Clerk, Langport, Somerset	8
Irvine—Three Filters at Greenhead	Corporation	Jas. Dickie, Town Clerk, Burgh Chambers, Irvine, N.B.	11
Kettering—Sludge Pressing Plant	Urban District Council	T. Reader Smith, Engineer, Market Hill, Kettering	11
Cosenza, Italy—Water Supply (£24,000)	Municipality	The Secretary, Cosenza	11
Dover—Supply and Construction of Tramways (3 miles)	Corporation	E. W. Knocker, Town Clerk, Castle Hill, Dover	12
Grao, Valencia—Harbour Piers (£540,000)	Official	Direccion General de Obras Publicas, Madrid	14
Christchurch—Water Supply Works	West Hants Water Co.	S. Newlyn, Secretary, Stour-road, Christchurch, Herts	14
Monte Video—Electric Light Installation	Uruguayan Government	The Ministry of Finance, Monte Video, Uruguay	15
Conway—Water Main Extension (11,000 yards)	Joint Water Supply Board	T. E. Parry, Clerk, High-street, Conway	15
King's Lynn—Pumping Engines	Corporation	E. J. Silcock, Waterworks Engineer, King's Lynn	16
King's Lynn—Cast-iron Water Mains (2,000 tons 18in.)	Corporation	E. J. Silcock, Waterworks Engineer, King's Lynn	16
King's Lynn—Pumping Engines and Boilers	Corporation	E. J. Silcock, C.E., Waterworks Engineer, King's Lynn	16
King's Lynn—Waterworks Engines	Corporation	E. J. Silcock, C.E., King's Lynn	16
Bolton—Draining and Levelling Rhode's Farm, Outwood	Corporation	R. G. Hinnell, Town Clerk, Bolton	16
Leeds—Covered Reservoir (6,000,000gal.)	Corporation	Thos. Hewson, City Engineer, Town Hall, Leeds	20
Monte Video—New Port (M. Gufrard, of Paris, Engineer)	Uruguayan Government	The Ministry of Public Works, Monte Video, Uruguay	30
Calcutta—Two Pumping Engines, Tallah	Corporation	J. Owen, Secretary, Municipal Offices, Calcutta	Feb. 1
Westray, Orkney—Addition (100ft.) Gill Pier	Harbour Commissioners	Robertson and Sinclair, Clerks, Kirkwall	6
Redheugh, Newcastle—Steel Bridge across the Tyne	Redheugh Bridge Co.	R. Spence Watson, Sec., 141, Pilgrim-street, Newcastle-on-Tyne	8
Porto Rico—Four Light Railways	Spanish Government	Spanish Consulate General, 23, Billiter-street, E.C.	25
Borgo and Mozzano Railway	Official	Italian Ministry of Public Works, Rome	Mar. 15
Brazil, St. Paulo—Lighting City by Gas	Municipality	Department of Agriculture, S. Paulo, Brazil	April 30
Girgenti, Sicily—Water Supply	Municipality	H.M. Consul, Palermo, Sicily	—
Astley—Sinking two Shafts 500 yards deep	Municipality	S. and J. Bailey, 30, Waterloo-street, Birmingham	—

## FENCING.

Brentwood—Hurdles to Burial Ground	Parish Council	F. Landon, Clerk, Brentwood, Essex	Jan. 2
Markham and Bathley—Fencing on Farms	Newark Charity Trustees	F. B. Footitt, Clerk, Newark-on-Trent	4
Handsworth—Enclosing Victoria Park	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth	6
Carshalton—Wrought, Vertical, Tubular, Unclimbable (850 yards, 6ft.)	Urban District Council	C. P. Lovelock, Clerk, High-street, Carshalton	11

## FIRE-ENGINE.

Edinburgh—Steam Fire Engine, Spare Wheels, and Fittings	Corporation	Thomas Hunter, W.S., Town Clerk, City Chambers, Edinburgh	Jan. 2
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## FURNITURE.

Weston-super-Mare—Furnishing Schools (650 places)	School Board	W. B. Lillington, Clerk, 46, Waterloo-street, Weston-super-Mare	Jan. 5
Cork—New Fixtures, Patrick-street and Grand-parade	A. Grant and Co.	J. F. McMullen, Architect, 30, South Mall-street, Cork	9

## PAINTING.

Blackpool—Painting Nine Houses, Lord-street	80, Dickson-road, Blackpool	—	—
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## ROADS AND STREETS.

Camberwell—Asphalte Paving in Mansion House-square	Vestry	C. W. Tagg, Clerk, Vestry Hall, Camberwell	Jan. 4
Paddington—West Australian Hardwood (650,000 paving blocks, 8in. by 9in. by 5in.)	Vestry	Frank Dethridge, Vestry Clerk, Harrow-road, W.	4
Paddington—Portland Cement (1,760 sacks), Thames Sand, Shingle, and Ballast	Vestry	Frank Dethridge, Vestry Clerk, Harrow-road, W.	4
Paddington—Pitch (40 tons), Creosote (350 gallons)	Vestry	Frank Dethridge, Vestry Clerk, Harrow-road, W.	4
Paddington—Granite Kerb and York Paving	Vestry	Frank Dethridge, Vestry Clerk, Harrow-road, W.	4
Paddington—Broken Granite (8,400 tons)	Vestry	Frank Dethridge, Vestry Clerk, Harrow-road, W.	4
Ramsbottom—Making-up Five Streets	Urban District Council	J. W. Barlow, Clerk, 17, Market-place, Ramsbottom	5
Croydon—Norway Granite Kerb (5,000ft.)	Corporation	E. Mawdesley, Town Clerk, Croydon	5
Leyton—Making-up Private Streets	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton	5
Sutton, Surrey—Making-up Weston-road	Urban District Council	C. Chambers Smith, Surveyor, Public Hall, Sutton	5
Edgware and Great Stanmore—Kerbing and Channelling on Main Road	Middlesex County Council	F. H. Pownall, County Surveyor, Guildhall, Westminster	6
Esher and the Dittons—Making-up Twelve Roads	Urban District Council	E. A. Eveott, Clerk, Brabant Villa, Thames Ditton	6
Felixstowe—Making-up Gainsborough, Felix, and Queen's roads, and Victoria-street	Urban District Council	F. B. Jennings, Clerk, Town Hall, Felixstowe	6
Southend-on-Sea—Hardwood Paving, Clarence-road	Corporation	Wm. Gregson, Town Clerk, Southend-on-Sea	7
Castleford—Making Footpaths	Urban District Council	H. Broadbent, Clerk, Castleford	7
Witton-le-Wear—Laying-out a Cemetery	Joint Burial Committee	Geo. Ramshaw, Clerk, Witton-le-Wear, Co. Durham	7
Poplar, E.—Steam Road Roller	District Board of Works	W. H. Fairfield, Clerk, 117, High-street, Poplar	8
West Ham—Making-up Cecil-road and five other streets	Corporation	E. F. Hilleary, Town Clerk, Town Hall, Stratford	12
Budeigh Salterton—New Road	Urban District Council	E. G. Warren, M.S.A., Commercial Chambers, Exeter	12
Burnley—Flagging Footpaths	Corporation	G. H. Pickles, Borough Surveyor, Burnley	—
Ashburn—Carriage Drive at The Pirs	Thos. O. Farmer	Sugden and Son, Architects, Leek	—
Bedford—Road-making, St. Cuthbert's Glebe Estate	Hobson and Martin	R. Lund, Architect, 8, St. Paul's-square, Bedford	—
Edmonton—New Road and Sewer	B.I. Land Co.	Harvey Dyball, 35, Bucklersbury, E.C.	—
Barry Island—Roads and Sewers	Weston Hall Estate Co.	Roberts, Hill, and Co., Land Agents, Barry Docks	—
Canton, Cardiff—Roads, &c., Frewyfla Estate	—	Jones, Richards, and Budgen, Architects, 18, St. Mary-st., Cardiff	—
Barry Dock—Making New Roads	—	A. T. Roberts, Hill, and Co., Land Agents, Barry Dock	—

## SANITARY.

Charing Cross-road, W.C.—Underground Conveniences	St. Martin-in-Fields Vestry	Chas. Mason, Surveyor, Town Hall, Charing Cross-road, W.C.	Jan. 4
East Molesey—Main Sewer, Molesey Park-road	Urban District Council	D. Cann, Clerk, Walton-road, East Molesey	4
Southend-on-Sea—Engines and Pumps, Eastern Valley Sewage	Corporation	Wm. Gregson, Town Clerk, Alexandra-road, Southend, Essex	11
Hertford—Stoneware Pipe Sewers (650 yards of 9in.)	Corporation	T. J. Sworder, Town Clerk, Hertford	12
Edinburgh—Reconstruction Morningside Sewerage	Corporation	Thomas Hunter, W.S., Town Clerk, City Chambers, Edinburgh	15
Bolton—Sewage Filtration Works, Rhodes Farm	Corporation	R. G. Hinnell, Town Clerk, Bolton	16
Portsmouth—Sewerage Works	Urban District Council	E. T. David, Clerk, Bridgend, Glam.	23

## STEEL AND IRON.

Beckenham—Seventy Steel or C.I. Ventilating Columns, &c.	Urban District Council	F. Stevens, Clerk, Beckenham, Kent	Jan. 4
Norway—4,250 Tons of Rails and Fish-plates	Norwegian State Railway	Manager's Office, Christiania	6
Edinburgh—Dry Sand Cast-iron Pipes (1,500 tons, 4in. to 16in.)	Water Trustees	Wm. Boyd, W.S., Clerk, Edinburgh	6
India—One Span 100ft., Five Spans 350ft. each	India Office	E. Grant Burs, Director-General of Stores, Whitehall, S.W.	6
King's Lynn—Cast-iron Pipes (2,000 tons, 15in.)	Corporation	E. J. Silcock, C.E., Waterworks Engineer, Municipal Offices, Lynn	16

## STORES.

Poplar—1,000 Galvanised Iron Pails	District Board of Works	W. H. Furnfield, Clerk, 117, High-street, Poplar, E.	Jan. 4
Hove—2,500c.yd. Hill Flints	Corporation	H. Endacott, Town Clerk, Hove	6
Rochester—C.I. and Stoneware Pipes, Bricks, &c.	City Council	A. Kennette, City Clerk, Rochester	6
India—Brass Boiler Tubes, Steel Sheets, Bars, &c.	East Indian Railway Co.	A. P. Dunstan, Secretary, Nicholas-lane, E.C.	6
Belfast—Earthenware Pipes for 1897	Corporation	J. C. Bretland, City Surveyor, Belfast	6
Chatham—Thames Ballast, Gravel, &c., for 1897	Corporation	H. P. Mann, Town Clerk, Chatham	7
Salford—Stone for Cemetery	Corporation	Samuel Brown, Town Clerk, Salford	7
Southampton—Pipes and Castings, under 15in. for 12 months	Corporation	G. B. Nalder, Town Clerk, Southampton	12
West Sussex—Flints, Stone, and 2in. Granite	County Council	W. B. Purser, County Surveyor, 31, Bedford-road, Horsham	13
London—Fire Hydrants for Three Years	London County Council	C. J. Stewart, Clerk, Spring Gardens, S.W.	21
Sunderland—Road Metal (2,000 tons, 2in. gauge)	Corporation	Borough Engineer, Town Hall, Sunderland	—
Manchester—Fig Lead (100 tons)	Waterworks Committee of Corporation	W. H. Talbot, Town Clerk, Manchester	—



LONDON.—For heating at the Warple-way School, for the London School Board:—  
 Milan, F. ... £850 0 0  
 Cannon, W. G., and Sons ... 887 0 0  
 Turner and Co. ... 675 0 0  
 Clarke, J. F., and Sons ... 569 0 0  
 Davis, G. ... 550 0 0  
 Dougall, A. Y., and Co., Ltd. ... 481 0 0  
 Brooke, J. W.\* ... 449 0 0  
 \* Recommended for acceptance.

LONDON.—For heating at the Walnut Tree-walk School, for the London School Board:—  
 Maxwell Bros., Ltd. ... £255 0 0  
 Rice and Son ... 210 0 0  
 Harding, R., and Son ... 167 0 0  
 Brittain, G. ... 166 0 0  
 Star and Son ... 160 12 0  
 Ford, J. F. ... 158 0 0  
 Williams, H. J. ... 149 0 0  
 Nightingale, B. E. ... 144 0 0  
 Patrick, J. and M. (accepted) ... 126 0 0

LONDON.—For heating at the Sleaford-street School, for the London School Board:—  
 Brown, H. ... £225 0 0  
 Williams, R. E., and Sons ... 221 0 0  
 Holloway Bros. ... 185 0 0  
 Lathey Bros. ... 169 0 0  
 Bulled, E. P., and Co. ... 165 0 0  
 Foxley, G. ... 155 0 0  
 Patrick, J. and M. (accepted) ... 115 0 0  
 Gurling, C. ... 105 0 0  
 Tucker, E. B. ... 104 0 0

LONDON.—For heating at the Creek-road School, for the London School Board:—  
 Proctor, E. ... £130 0 0  
 Jones and Groves ... 121 3 0  
 Holding, W., and Son ... 119 0 0  
 Musgrove, S. ... 118 5 0  
 Holliday and Greenwood (accepted) ... 106 0 0  
 Banks, W. ... 104 15 6

LONDON.—For heating Ashburnham School, for the London School Board:—  
 Cannon, W. G., and Sons ... £437 0 0  
 Davis, G. ... 300 0 0  
 Simmons, W. ... 297 15 8  
 Wontner-Smith, J., Gray, and Co. ... 275 18 0  
 Ellis, J. C. and J. S., Ltd.\* ... 269 10 0  
 \* Recommended for acceptance.

LONDON, S.E.—For cleaning Riley-street School, for the London School Board:—  
 Garrett, J., and Son ... £312 0 0  
 Lilly and Lilly, Limited ... 253 0 0  
 Williams, H. J. ... 231 0 0  
 Banks, W. ... 225 0 0  
 Line, H. ... 222 0 0  
 Johnson and Co. (accepted) ... 214 10 0

LONDON, S.W.—For heating school in Garratt-lane, for the London School Board:—  
 Fraser, J., and Son ... £298 0 0  
 Price, H. C., Lea, and Co. ... 65 0 0  
 Rosser and Russell, Ltd.\* ... 53 10 0  
 Recommended for acceptance.

LONDON, S.E.—For heating Laxon-street School, for the London School Board:—  
 Grundy, J. ... £67 0 0  
 Vaughan and Brown, Ltd. ... 29 7 0  
 Simmons, W.\* ... 27 6 0  
 \* Recommended for acceptance.

LONDON, E.—For heating Dempsey-street School, for the London School Board:—  
 Tabor and Hinchcliffe ... £164 0 0  
 Toale and Somers ... 394 0 0  
 Kallaway, A. J., and Co. ... 389 0 0  
 Maguire and Son ... 347 15 0  
 Russell and Co. ... 319 0 0  
 Seward, C., and Co.\* ... 308 0 0  
 \* Recommended for acceptance.

LONDON, S.E.—For heating Brockley-road School, for the London School Board:—  
 Davis, G. ... £320 0 0  
 Tabor and Hinchcliffe ... 274 9 0  
 Bates and Pearce ... 176 0 0  
 Brooke, J. W. ... 175 0 0  
 Biggs, J. ... 164 10 0  
 Ellis, J. C. and J. S., Ltd.\* ... 147 10 0  
 \* Recommended for acceptance.

LONDON.—For heating Rolls-road School, for the London School Board:—  
 Tabor and Hinchcliffe ... £698 10 0  
 Turner and Co. ... 635 0 0  
 Truswell, W., and Son ... 445 0 0  
 Wippell Bros. and Row ... 400 0 0  
 Clarke, J. F., and Sons\* ... 393 0 0  
 \* Recommended for acceptance.

LONDON, W.—For cleaning Manchester-street School, for the London School Board:—  
 Marchant and Hirst ... £198 0 0  
 Nicholson, T. ... 196 0 0  
 Wales, G. ... 179 12 0  
 Cruwys, T. ... 177 0 0  
 Sparks, A. M. ... 175 0 0  
 Corfield, S. H. ... 142 0 0  
 Foxley, G. ... 139 0 0  
 Chappell, W. (accepted) ... 129 15 0

LONDON, S.E.—For cleaning Farncombe-street School, for the London School Board:—  
 Williams, H. J. ... £310 0 0  
 Marchant and Hirst ... 264 10 0  
 Stevens Bros. ... 249 10 0  
 Hornett, W. ... 240 0 0  
 Line, H. ... 216 0 0  
 Johnson and Co. (accepted) ... 203 0 0

Brixton, S.W.—For cleaning Lyham-road School, for the London School Board:—  
 Maxwell Bros., Limited ... £175 0 0  
 Garrett, J., and Son ... 169 0 0  
 Rice and Son ... 169 0 0  
 Holloway Bros. ... 158 0 0  
 Bulled, E. P., and Co. ... 157 0 0  
 Star and Son ... 146 0 0  
 Triggs, E. ... 119 0 0  
 Somerford, H., and Son (accepted) ... 92 0 0

LONDON, S.W.—For cleaning (and exterior painting to be done at Easter) St. Andrew's-street School, for the London School Board:—  
 Holloway Bros. ... £398 0 0  
 Smith, W. ... 386 0 0  
 Lathey Bros. ... 327 0 0  
 Garrett, J., and Son ... 284 0 0  
 Stimpson and Co. ... 270 10 0  
 Tucker, E. B. ... 249 0 0  
 Somerford, H., and Son ... 244 0 0  
 Triggs, E. (accepted) ... 233 0 0

LONDON, S.W.—For cleaning (and exterior painting to be done at Easter) at Shillington-street School, for the London School Board:—  
 Brown, H. ... £508 0 0  
 Gurling, C. ... 386 10 0  
 Holliday and Greenwood ... 385 0 0  
 Williams, R. E., and Sons ... 355 0 0  
 Garrett, J., and Son ... 332 0 0  
 Nightingale, B. E. ... 325 0 0  
 Derby, A. W. ... 315 0 0  
 Tucker, E. B. (accepted) ... 277 0 0

LONDON, S.E.—For cleaning Holland-street School, for the London School Board:—  
 Lilly and Lilly, Limited ... £149 0 0  
 Kemp, G. ... 130 0 0  
 Williams, H. J. ... 129 0 0  
 Castle, W. and H. ... 128 5 0  
 Harding, R., and Son ... 126 0 0  
 Wales, G. ... 121 0 0  
 Kiddle, J., and Son ... 109 0 0  
 Stimpson and Co. ... 96 10 0  
 Triggs, E. (accepted) ... 83 0 0

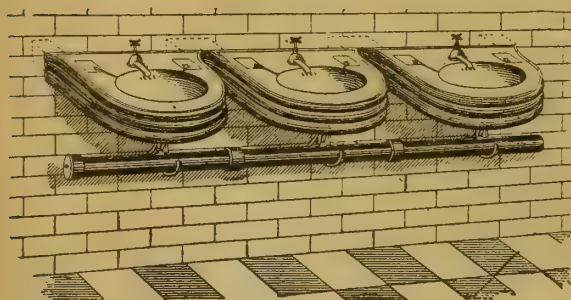
PECKHAM.—For alterations and additions, 29, Gordon-road, Peckham, for Dr. Hague. Mr. J. William Stevens, A.R.I.B.A., 21, New Bridge-street, City, E.C., architect:—

Parker, G. ... £457 0 0  
 Bowyer, J., and Co. ... 437 0 0  
 White, A., and Co. ... 435 0 0  
 Browne, A. J. ... 397 15 0  
 Castle, W. H. ... 345 0 0  
 King, H.\* ... 330 0 0  
 For ovens:—  
 Smith and Sons\* ... 178 10 0  
 \* Accepted.

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### BROADWAY CHAMBERS, WESTMINSTER, LONDON, S.W.



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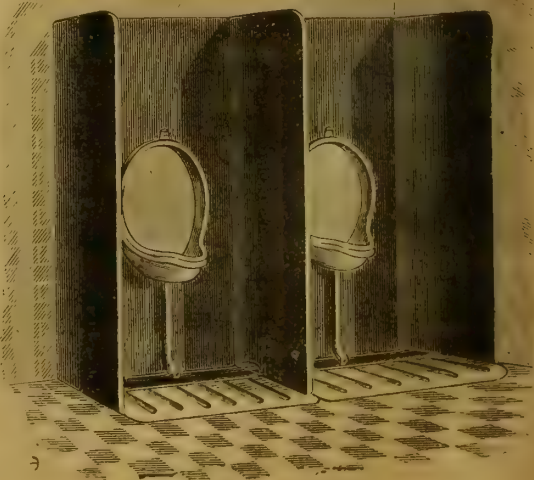
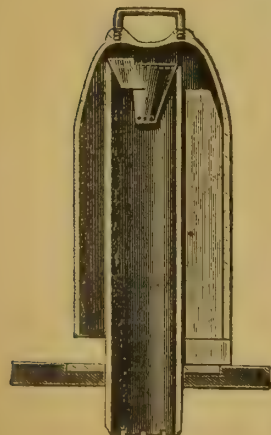
OF

Rogers Field's 1889 Patent  
Automatic Flushing Siphons.

LATRINES, CLOSETS, URINALS, LAVATORIES, FLUSHING CISTERNS, GREASE TRAPS, INTERCEPTING TRAPS, &c., &c.

Gold Medal—International Health Exhibition.

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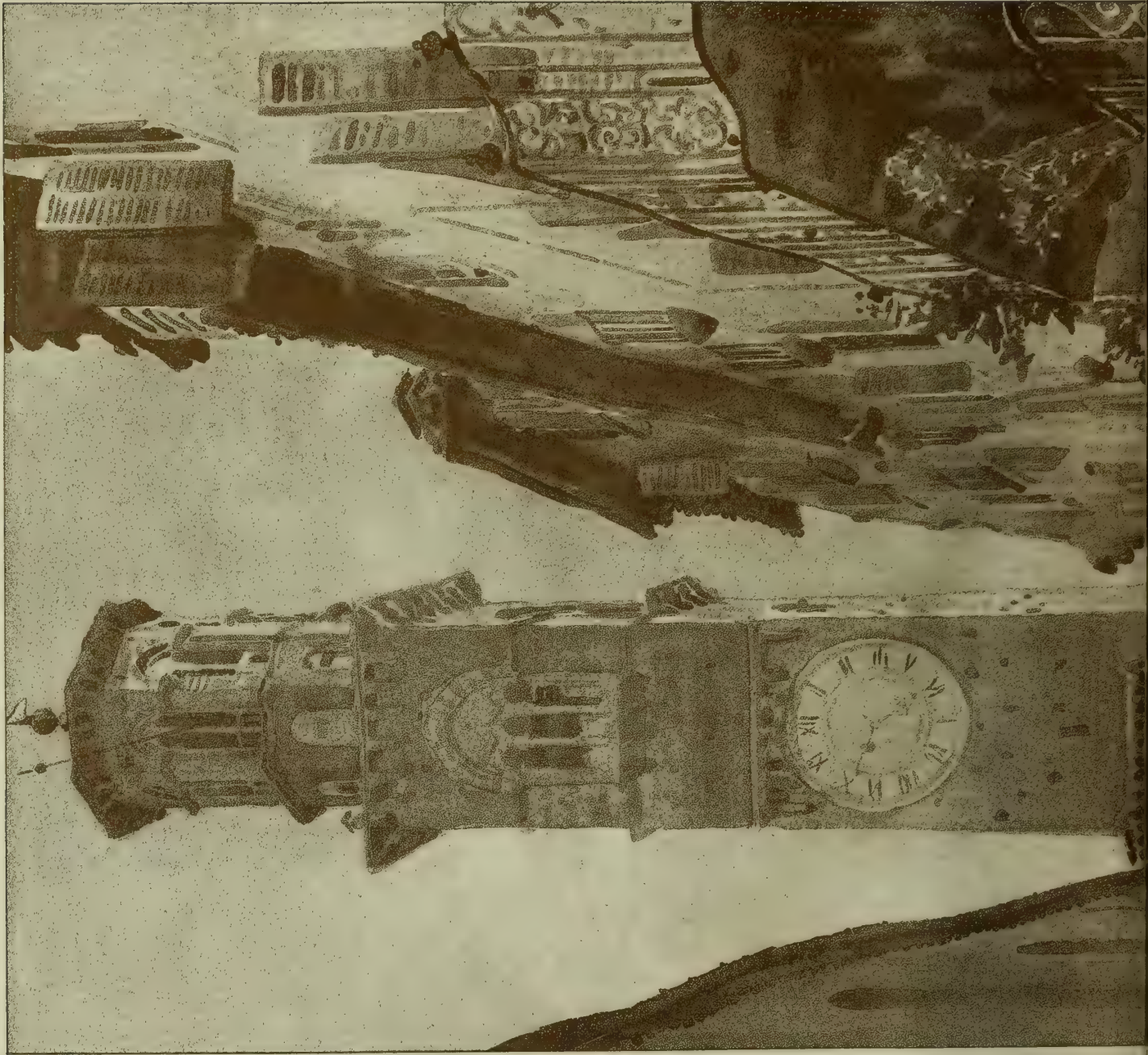




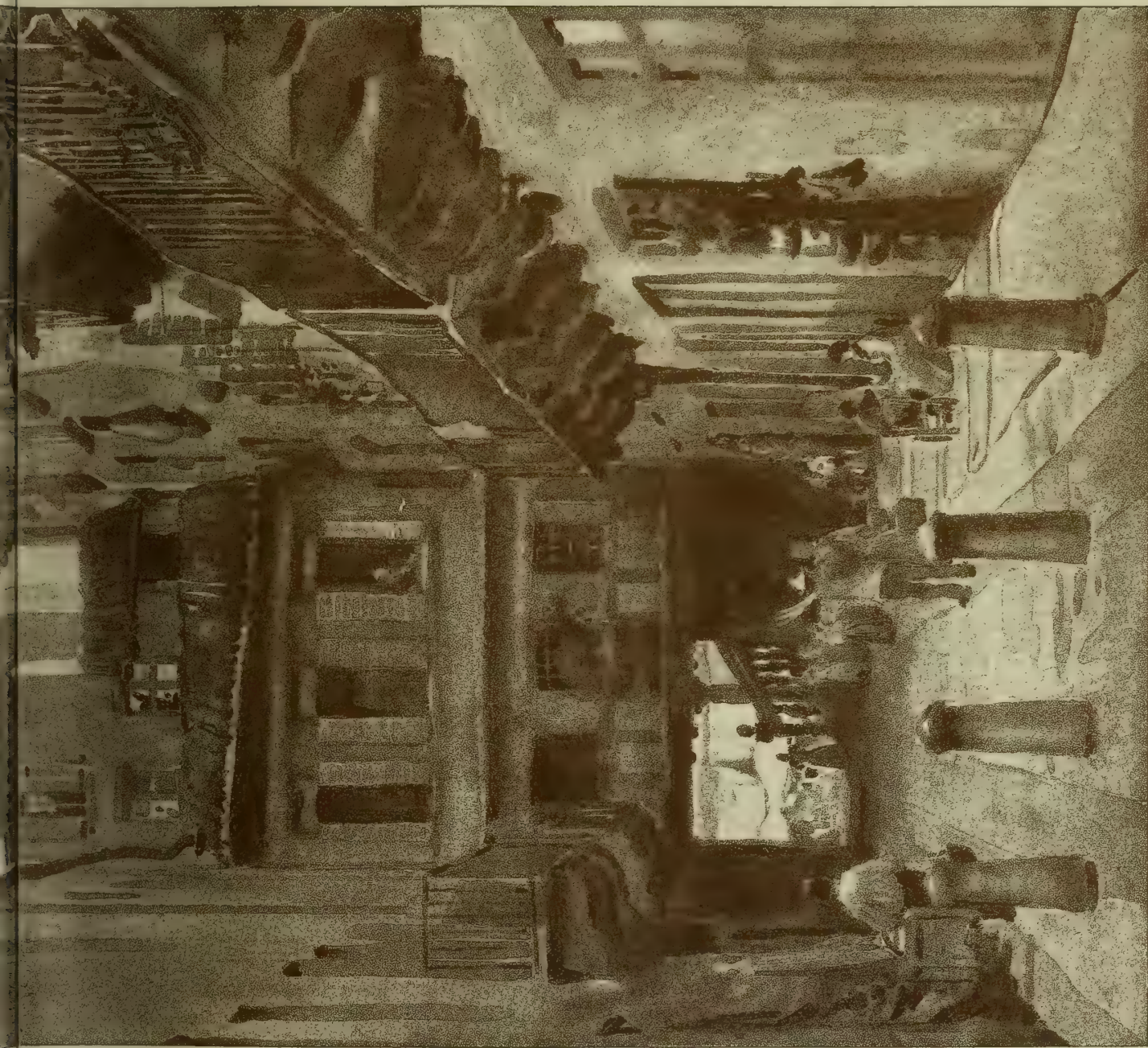




THE BUILDING NEWS, JAN. 1, 1897.







"PHOTO TINT" by James Akonmat. Queen Square London W.C.

AT VERONA BY WALLACE-RIMINGTON RPE.













FACADE & LIENZO PATIO DE LA MEZQUITA ALHAMBRA 5



JAN. 1, 1897.



"PHOTO-TINT", by James Akerman 6, Queen Square London WC

HARRIET FORD 1832 FROM THE COLLECTION OF THE RIGHT HON SIR CLARE FORD GCB

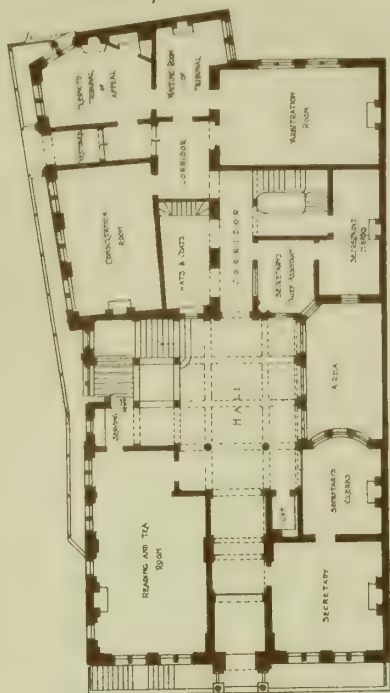




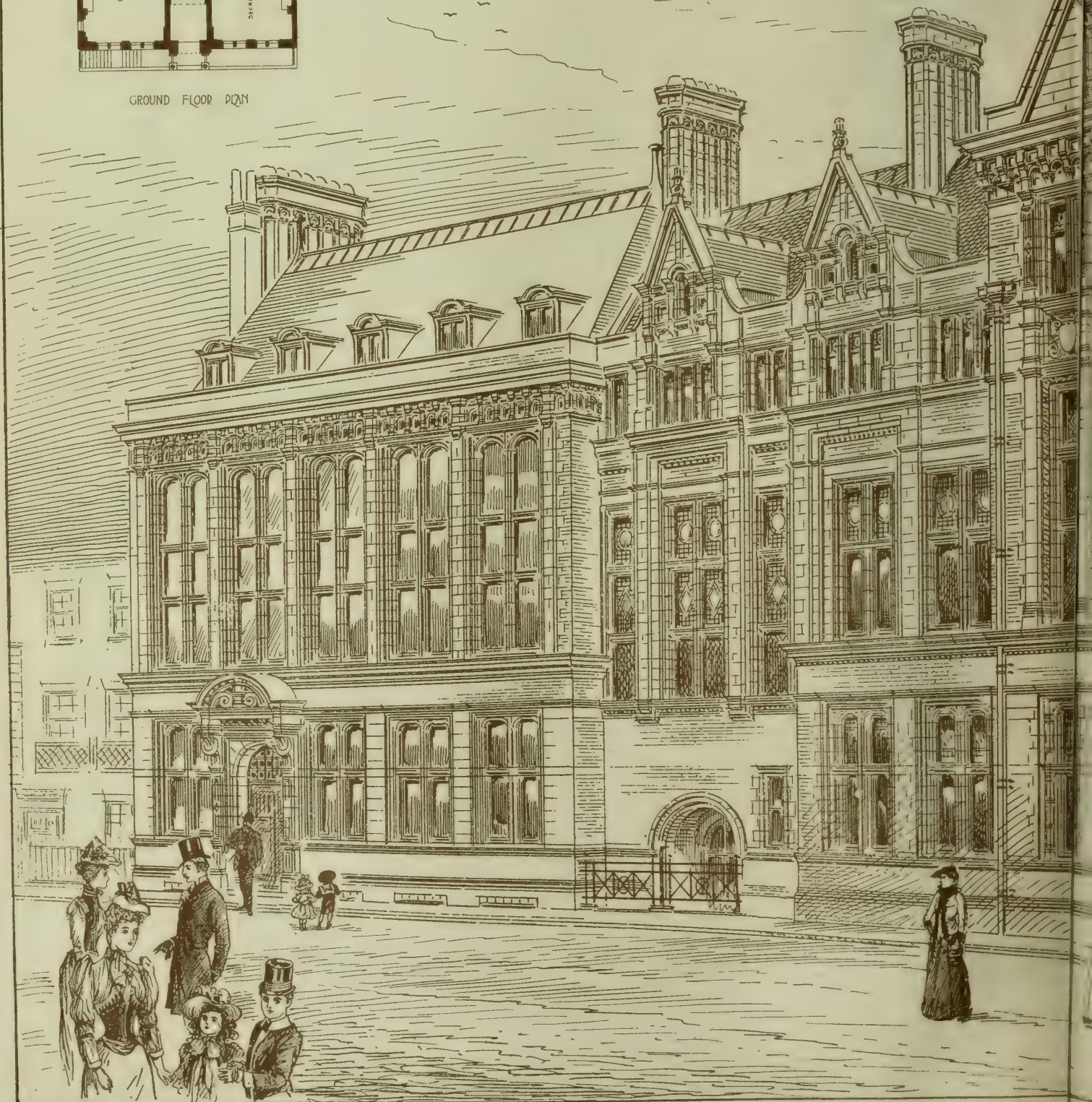
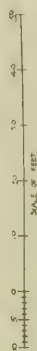




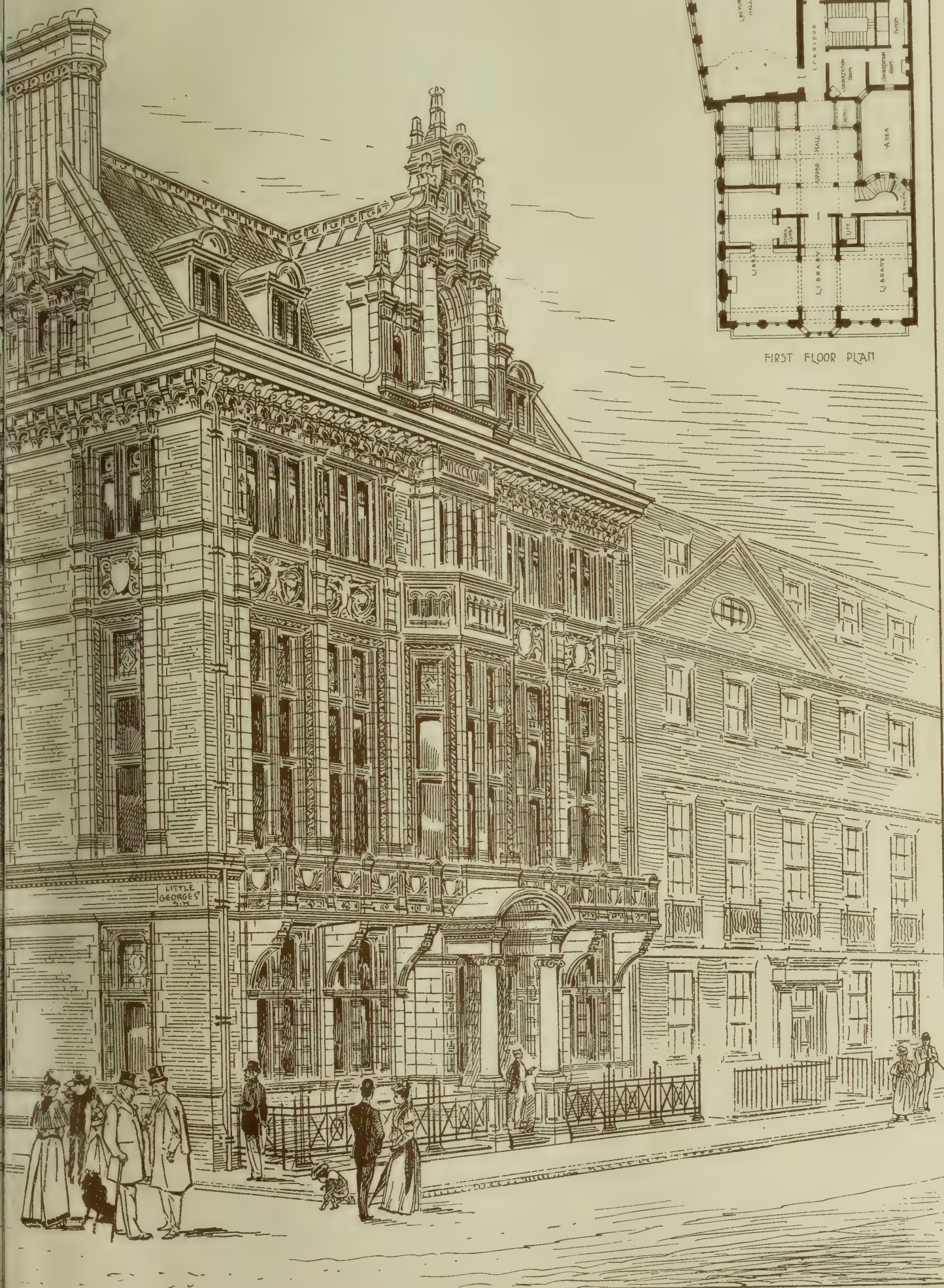




GROUND FLOOR PLAN







FIRST FLOOR PLAN













FROM THE COLLECTION OF MR W T OLDRIEVE.

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THE HALL AFTER J. NASH.

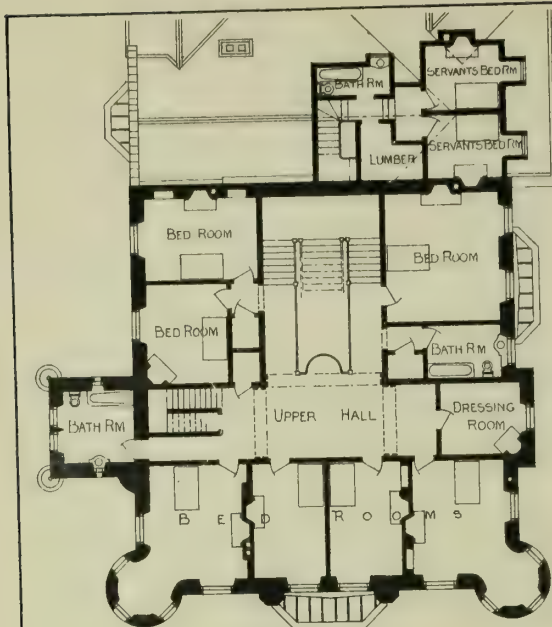




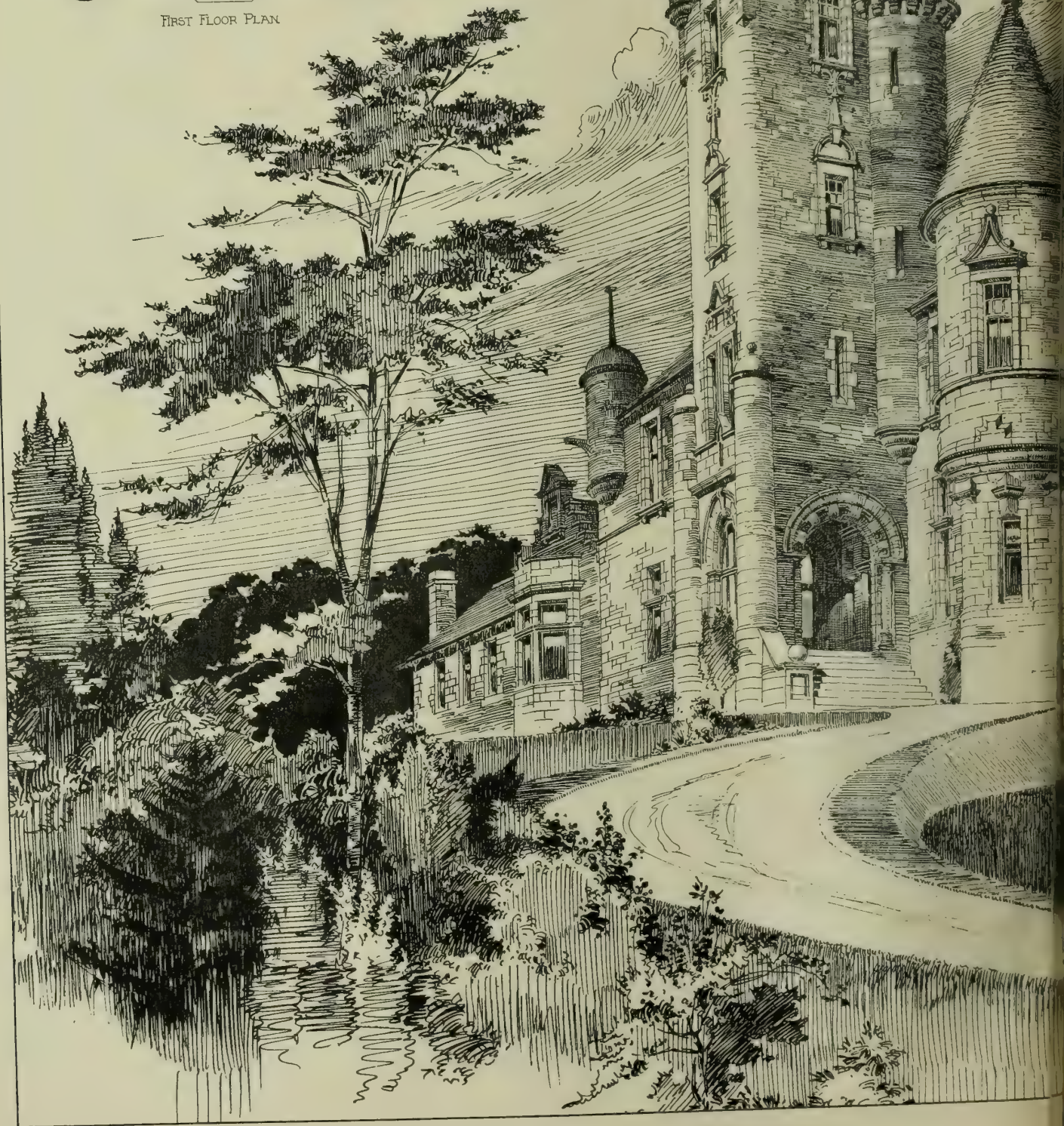








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GROUND FLOOR PLAN.









# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXXII.—No. 2192.

FRIDAY, JANUARY 8, 1897.

### AGGRESSIVE DETAILS.

FEW men are able to observe a just proportion between the general and the particular. Lord Bacon, speaking of "Studies," says, "Expert men can execute, and perhaps judge, of particulars one by one; but the general counsels, the plots, and marshalling of affairs come best from those that are learned." A modern philosopher says, to the same effect, "If you want roughly to estimate anyone's mental calibre, you cannot do it better than by observing the ratio, in his talk, of generalities to personalities." If we apply these dicta to architects, it will be plain which amongst them is the greater master of his profession—the man who can design in the mass or in detail. But buildings are so largely made up of parts, each more or less complete in itself, that it is obvious we cannot accept the rule too strictly. The great Italian masters invariably followed the practice of making studies for every detail before completing their design; every hand, foot, and the drapery of each figure of the picture was studied before they began to paint. Modern painters also (like the late Lord Leighton), we know, study their accessories, figures, and draperies separately before commencing the picture—a point mentioned by Sir E. J. Poynter in his Presidential address before the students of the Royal Academy. The modern designer of buildings approaches his subject in less favourable circumstances: his under-studies are often much less tractable; he cannot manipulate them to his liking. In many cases his details are beyond his control. Here, indeed, the comparison ends; while the painter and sculptor can both mould their details, the architect has to marshal a number of conflicting forces, and try to bring them into line with his work. It is not a matter of choice, but a duty, and it requires the virtue of patience to master little details of engineers, plumbers, ventilating experts, and the rest of the innumerable trades with whom he has to associate. For him it is "more studious to divide than to unite," to try to master each detail before he can incorporate or harmonise it with the design, for if he leaves them to others he gives away his opportunities.

The architect must be able to look at a building as a whole and in piecemeal, and it is this two-fold capacity which is so difficult to attain with any proficiency, and the reason is not far to seek. Who does not know the client whose sole desire seems to be to worry his architect about some trifling detail?—perhaps the position of a certain apartment, the back or side door to his study or smoking-room, or he may fidget a good deal about his conservatory or billiard-room. Occasionally the question of warming or ventilating is the question that is uppermost. To some men the building is a mass of details. It is all little peccadilloes, fire-stoves, lavatory fittings, door furniture, and decoration. Nothing is thought about the general effect or the architecture; in fact, the object of these clients would be served equally well if each of the several details were given to a number of tradesmen, who should carry them out to the client's entire satisfaction. Why such a client should come to an architect may be questioned. He does not care a straw about elevation, plan, or general effect, so long as his particular whims are carried out. Of course, in the public building there is far less of this fidgeting about details: the architect

is not amenable to one master or to one set of injunctions; the design is accepted in its completeness, as any special alterations which receive attention after the contract is signed are subsequently ordered in the regular way. No doubt we have here one reason why the public building is a better test of the designer's skill than his private works are. Not that this is invariably the rule, as the oneness and unity of conception very largely depends on the object of the building. If it be full of parts, offices, and departments like a municipal building, or be particularly utilitarian, like a block of baths and washhouses, the detail is sure to control and influence the design, it may, in fact, so hamper the mind that a very unsatisfactory whole is the result. The man who can design a great monumental building, or art gallery, a palace for the Legislature, a church, or a mausoleum, would find it extremely difficult to turn his attention to matters like drainage, or ventilation, or heating apparatus, or even to arrange the details of fittings or decoration with tradesmen; and do we not often find that the skilful master of details seems powerless to grasp the architectural dignity of a palatial building? The fact, however, remains that the architectural conception as a whole is not so much restricted in the public as in the private building, and that the man who studies the former class is the more able to devote himself to the higher functions of his art.

We may look at a building as a collection of trades or branches of workmanship, or simply as a work of so-called art, and it would be of some interest to inquire how the great masters of architecture in the past have thought of the matter. Certainly the old Greek of the time of Pericles placed oneness of design and purpose above all else; he was not trammelled about questions of light, of ventilation, of warming, or arranging with tradesmen. His one concern was to design a great sacrificial temple, in which the sculptor, modeller, painter, and decorator all contributed their share without any hitch as to what was to be the cost, or what or how much should be done. So the Mediæval architect designed his great cathedral upon lines laid down by the authority and by the fraternity to which he belonged. There was no question of pleasing one party in the Church or another; whether there should be an imposing altar or a mere table; how the presbytery should be arranged. The various crafts—glass-painters, metal-workers, tile-makers, sculptors, and carvers—worked harmoniously under one general direction, each being paid his wages without competition and dispute. The modern "quantities" and contract were unknown. But the modern engineer or fitter had not made his appearance. We do not remember to have heard that any of our great Mediæval buildings were spoilt by unsightly ventilating tubes or terminals; or the vaults and roofs disfigured by pipes from heating apparatus before the advent of the modern tradesman and contractor, who came to mar the dream of artistic life, and to set utilitarianism and manufacture against architecture, about the 18th century. And so, during the earlier Renaissance era, we find the architect and artist unshackled and undisturbed in their thoughts by modern invention, tradesmen, and troublesome clients. When modern industries appeared all this was changed. All the artist craftsmen became commercial and competitive, and the hostility commenced between art and trade. In the old days the architect designed his buildings as a whole, the details fell into their places naturally without effort; now they are devised by men who know nothing of the building; they are made for sale and competition, they crush and hamper the architect's work, they fight their way upon his attention before even his plans are completed, till really we may almost believe

the architect's design is to make a place for them, rather than that they shall be adapted to it. The makers of modern goods like iron girders, columns, lifts, staircases, stoves, chimneypieces, and decoration are the men who get the ear of the owner. The architect of the present day is no longer the director: his chief duty, at any rate, in our large commercial buildings and in the residences of citizens, is to provide for a miscellaneous host of fittings and details which have nothing to do with architecture. He has, in short, to accept the modern idea of a collection of trades and requirements: he must know everything—how to fit up a modern kitchen to a large hotel, to place and heat a conservatory, to arrange a perfect system of drainage and ventilation, to specify a plan of heating and lighting, and to provide for modern schemes of decoration, and all on competitive prices. The more successfully and cheaply he can carry out these matters, the better. It is not even necessary that he should take particular pains to make his design suitable for these various offices; so long as they are found to work well or to satisfy his client, that is all that is looked for.

That this is painfully apparent in very many of our great town buildings, shop premises, office blocks, hotels, and even houses, it is needless to say. The ordinary owner or speculator does not trouble to look into little points or trifles, as he would call them; as, for instance, how the engineer's or smith's work encroached on the design; how the ceiling of a room was spoilt by the raking soffit of a staircase; how iron columns or girders destroyed the architectural effect of a banking office or shop; or how painfully some fitting, as a stove, marred the design of an apartment. He thinks only of the expense. These are the sort of things which try the patience and temper of the modern architect. Can one wonder, when Mr. Smith or Mr. Jones undertakes to supply fittings at 20 per cent. less than anyone else in the trade, that the architect has no voice in the matter. He may actually take the trouble to make drawings and specifications for a certain piece of ironwork; but the manufacturer is before him. A conscientious architect likes to make designs for his chimney pieces, stair balustrades, decorative details;—for metalwork, or for tiles for dadoes or wall linings; but what chance has he when all such things are to be had ready made at half the cost. House-furnishers, fitters, and decorators come between him and his client—a condition quite unknown to the earlier ages of art.

Comparing the old with the modern detail, we also find that the ancient designer of buildings took care not to give too much prominence to his details, and this rule holds good even as regards sculpture, carving, or decoration. We can show nothing so restrained and beautiful as the sculptural groups which adorn the metopes of the Parthenon, little or nothing so dignified or related to the structure as the frieze decoration round the cella, known as the "Panathenaic Procession," or the grand groups of symbolic sculpture which fill the pediments. Casting our eyes over the beautiful imagery of storied saints and legends which crowd the western portals of Chartres or Rheims, Peterborough, or Wells Cathedrals; or over the vigorous and delicate-carved details of our buildings of the earlier and purer periods, we are obliged to admit that profuse as the detail and carving was in some instances, it was designed with special reference to the architectural design. The exceptions only establish the rule. The profusion and richness of detail which is found in the churches and guild-halls of Belgium, like the Cloth Hall of Louvain, are instances of over-elaboration which sometimes overpower the structural lines, but in this case we must remember the Flemish style was largely



borrowed, and whenever this happens structure and function are often lost. The great weakness of modern detail is its isolated character: it generally seems made miles away and stuck on. If it is a sculptured figure or a group, it looks as if had been made to suit any position or any building; there is a lack of character and relation to the architecture. Or if it is a piece of carved woodwork or metalwork, it comes probably from a London workshop or from Birmingham. It may even be selected from an illustrated catalogue. May we not point to scores of modern churches in which the bench-ends, screens, pulpits, lecterns, &c., have this mechanical-manufactured character stamped on them, the work executed a hundred miles away by shop-hands or apprentices to the trade? This isolation vitiates the result. But the architect cannot help it: his work is too much a question of pounds, shillings, and pence to permit him to interfere, and he is obliged to submit to contract conditions. Even if there is a "provisional sum" provided, he is not always master. Next, there is a want of suitability and harmony. We go into a new church with waggon-headed boarded vault, plain brick arcades, broad and simple in the extreme. Hanging from the roof are elaborate coronæ and lamps of a Late Gothic type; or it is a brass lectern, that strikes us as painfully out of accord with such a church. The tiles, too, may be far too florid, and the wooden pulpit or font cover equally out of date with the building. In the selection of goods of this description, the architect at least has some power in exercising his authority, and his neglect to do so merely strengthens the hands of clients and manufacturers. The study of details is, no doubt, a special gift. To pick them out and assimilate them, belongs only to a few. Only the leading men of the profession have the skill and opportunity of designing their work in whole or in part. The average man allows the details to drift away from him: they are made matter of contract or cost, and the tradesman gets his own way. It is a single-handed fight to assert the claims of art against building owners and promoters and the tradesman, and we have few Pugins and Streets, Seddings and Norman Shaws—the age is getting more and more commercial. And, as someone has said, how can we expect the same quietness and repose which the calm atmosphere of the monastery afforded? All is now bustle and confusion: the designer is no longer at rest in his office; directly he betakes himself to his design he is pounced upon by dozens of tradesmen and agents; his time is frittered away by answering letters and attending meetings of committees and boards, and the many disturbing and irritating elements of a busy town life thrust themselves upon him.

#### WORKS OF THE LATE LORD LEIGHTON AT THE ROYAL ACADEMY.

THE magnificent collection of works of the late Lord Leighton, past President of the Royal Academy, that have been hung for the Winter Exhibition at Burlington House includes many canvases radiant with light and splendid colour that impress the mind with a saddened interest. One by one we come to a picture that awakens the memory of a past Academy exhibition under the late President's rule; works that have shed their lustre upon many a year of art, and have become historic. In this noble display of the works of one master we are at once astonished at the prodigious number of the pictures and the diversity of gifts and qualities he possessed. The first of the works exhibited, in point of time, is "Cimabue Finding Giotto in the Fields of Florence," in Gallery IV. The painter records the incident of Giotto drawing with a coal on a

stone the figure of a lamb, and was painted in 1850. From this year to last year Lord Leighton's work is to be seen in consecutive order.

The influence of his earlier teaching at Frankfurt and Florence is strong in the works of early date. In this picture of "Cimabue Finding Giotto," and the well-known larger canvas painted at Rome, "Cimabue's Madonna Carried in Procession Through the Streets of Florence," lent by the Queen, painted in 1855, we see the original impulses of the great painter; the lines and composition and contrasts are a trifle hard, but none the less satisfactory, because they have little of the polish and refinement of harmony which his later pictures possess. As a composition the great "Cimabue's Madonna"—a picture few have seen—is a wonderful work for a young man of five-and-twenty to have painted; it is, of course, chiefly decorative in style and treatment, but it is all the same a great work, in which can be seen some of the best qualities of the great painter's work. To take the first gallery, we see instances of the gradual development of Leighton's taste. Amongst the ideal heads, classical groups and compositions, we cannot fail to note in them the surprising invention, delicacy of line, and variety of colour and arrangement. Who, for instance, can believe that the picture of "Michael Angelo Nursing his Dying Servant" (2) is by the same hand as "Invocation" (9), a work 27 years later? Yet they are both remarkable in different ways. The wonderfully white and transparent hands and face of the dying man in the first are worthy of the most careful realist; while the diaphanous drapery of the young girl in the latter, standing before an altar, her eyes uplifted to the goddess on the capital of an Ionic column, with the marvellous delicacy and subtle painting of the maiden's face and arms, is a piece of idealism the most perfect. Another of the painter's latest works, painted in 1896, is the figure of a girl in white drapery, her auburn hair falling over her shoulders (4), left unfinished, a most luminous and charming ideal portrait, with beautiful profile, exquisite in the modelling of the shoulders. Again, the full-length subject, "Tragic Poetess" (1890), in draperies of purple and grey, seated on a terrace facing the sea; the charming child studies (8), and another of graceful simplicity of line and subtle harmony of colour, "The Fair Persian" (14), painted last year; the dignified and full-face bust of "Roman Mother" (1867); "Clytie" (1892); the bust of a girl, "Vestal" (16); "Sister's Kiss" (19), a very charming figure of a girl in a green robe leaning against a wall, whom a little child on the wall is kissing with tender embrace; a beautiful fair-haired girl in purple drapery, entitled "Day Dreams" (25), are among the most noted works in this gallery. Two large compositions of classical subjects are on opposite walls. One is "Hercules Wrestling with Death for the Body of Alceste" (1871). The dead body of Alceste robed in white under large trees lies near the seashore. The groups of figures of mourners and of Hercules wrestling with Death make up a dramatic scene of much power, which has received the tribute of Browning. On the opposite wall is a large, warmly-painted picture representing Iphigenia, clad in light drapery, lying asleep under the shade of large trees, and on the other side Cymon in red robes is gazing at her. Nothing can excel the beauty and delicacy of the lines of the drapery of the sleeping goddess, or of the tones of gold and red, and the rising moon on the sea.

Gallery II. contains several pictures of interest, which enable one to contrast the earlier with the later style of the late President. Take, for instance, No. 28, "The Star of Bethlehem" (1862), a solidly-painted work, but very unlike the more refined and polished

examples we see around us, as in the well-known "Perseus and Andromeda," painted in 1891, and now belonging to Messrs. A. Tooth and Sons, wherein the undraped figure of Andromeda is seen bound to a rock in the sea, under the huge outstretched dragon's wings, the monster's head turned upwards, his mouth belching forth flame towards Perseus on the winged steed in the sky. The composition and colour of the rocks, the graceful figure of Andromeda, the sapphire-hued sea, and the pale orange drapery of the maiden are consummate examples of idealised form and refined technique. Another work, "Ariadne Abandoned by Theseus" (36), representing the graceful and ill-requited Ariadne clad in white, dying on a rocky promontory, may be compared to the last composition. Painted in 1862, it shows a less idealised conception, and the execution and colour are harder. About the same date, we have "Greek Girl Dancing" (38), a girl in white drapery dancing before a group on a terrace, full of motion and grace, and of nice colour. Then the famous "Garden of the Hesperides" (39), where three beautiful maidens recline under a tree of golden apples, caressing the dragon, displays a wealth of colour of orange, citron, and red; a beautiful bust of "Atalanta" (44); the "Bath of Psyche," one of the Chantrey Bequest pictures, a work of subtle grace of line and beauty of colour (51), all historic pictures well known from the engravings and reproductions of them, show the work of the painter during the last decade. The portrait of "Lady Coleridge," with its dark-red background, is a work of which Reynolds might be proud. The modelling of the arms and the grace and pose of the seated figure are admirable; so also is that fine piece of grouping and colour, "Golden Hours," painted in 1864 (40), where a handsome-featured, sorrow man, with dreamy eyes and long dark hair, plays on a spinet, a lady with embroidered white dress leaning on the instrument, intently listening to the melody. The golden background of the room is in fitting harmony. Very beautiful and refined in colour is the "Music Lesson" (47), two fair girls in Eastern dress, seated on a marble bench, the elder teaching the younger how to play a stringed instrument.

The Third Gallery is devoted to the exhibition of the greater canvases of this master. Here we have an array of masterpieces which may well of themselves form a noble national collection. In the corner is that half-tragic statuesque figure, "Fatidica" (1894), so well known to visitors of that year's Academy. The sad eyes of the prophetess, seated in a recess, the greenish shades of the white drapery, the light coming from above, are well known—indeed, the same type of face occurs in other of Leighton's figures. Near this hangs his "Eucharis" (1863), a white-robed maiden, with a basket of fruit on her head (55), a very graceful figure; then "Venus Disrobing for the Bath" (1867); then in rapid succession follow the grand classical subjects of the "Captive Andromache" (1888), now belonging to the Corporation of Manchester—a colossal picture, crowded with figures, and the captive Andromache standing in the midst of the throng about to draw water at the Hyperian well. "The Spirit of the Summit" (1894); "Clytie," painted last year, representing the daughter of Oceanus kneeling at an altar in an attitude of supplication towards the setting sun, full of golden tones; the very fine picture of "Orpheus and Eurydice" (61); the beautiful "Return of Persephone," painted 1891, where, with outstretched arms, Demeter waits for his wife—lent by the Corporation of Leeds; the famous "Cimabue's Madonna," from Buckingham Palace, already noticed; the pathetic picture, "The Last Watch of Hero," showing the broken-hearted



maiden looking down at the body of Leander on a rocky shore, belonging to the Corporation of Manchester; "Flaming Juné" (1895), a wonderful study of graceful line, modelled limbs, and subtle charm of colour; "Summer Slumber" (70), a beautiful maiden in light pink drapery asleep; and "The Daphnephoria" (1876), a very large canvas representing a procession of priests and Theban maidens crowned with laurel in honour of Apollo. These pictures are too well known to Academy visitors to need comment. For subtilty of drawing and colour harmonies they bear witness to the study of detail, of modelled arms, draperies, and exquisite shades of colour of this painter. "Twixt Hope and Fear" (68) is remarkable for its modelling and light in the figure of the girl.

In Gallery IV. are hung many of the smaller studies and sketches. The Princess of Wales sends "Head of a Girl" (88), in green and gold dress, exquisite in the modelling of the fair face and neck, and charmingly delicate and transparent in colour. In this room the large circular picture of the "Sea giving up the Dead," exhibited in 1892, lent by Henry Tate, a portrait of Lady Nias (1853), a study of head of a pretty fair-haired girl, "Letty" (114); "The Bracelet" (128); sketches for a picture to be called "The Mosaicists" (145-148), and various other studies of many of the larger pictures may be seen. In the Water-Colour Room are a very choice collection of the studies for figures and groups and drapery, lent by the Fine Art Society, South Kensington Museum, and many individual collectors. Mr. G. Aitchison, A.R.A., sends a very beautiful study miniature of girl in purple drapery crouching on a marble seat; and there are many very beautiful studies of heads and details of drapery for the larger pictures we have mentioned. These show that Lord Leighton was a careful student; that he made separate studies of every detail of his pictures. Considerable breadth, freedom, and vigour mark these smaller works of the master, and many of them are done in chalk. We notice also studies for his fine fresco of the reredos in Lyndhurst Church in chalk, one of his earlier decorative works. Lord Leighton was chiefly a great decorative painter, and it is in this direction we must mainly estimate his influence amongst the great painters of the age.

#### ADAPTABLE SPECIFICATIONS.—XXV.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued).

AT what stage the brickwork is to be pointed is an important question, which should be clearly settled in the specification before the contract is entered into. If that document does not say in so many words that every part of the walling is to be pointed as it goes on, the builder may possibly claim an extra for doing this, and assert that it would have suited his purpose better to rake out the joints and point it all down together at completion. For external facings, especially, this is a very unsatisfactory sort of procedure. The joints are seldom raked out deeply enough, and the pointing crumbles away or falls out in pieces, after a few rains and frosts. A struck joint, made with the point of the trowel in the mortar with which the bricks are being laid, is to be recommended for outside work. But there are two ways of making such a joint—a good way and a bad one. In the bad way, the mortar at top of the joint is flush with the bottom arris of the upper brick above, and its face below this is pressed in diagonally, so as to leave a strip from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. of the flat top of the lower brick exposed to the weather all the way along. Damp settles on this narrow ledge in every joint, and soaks both into the wall and the pointing, and a better device for keeping them saturated with moisture could not easily be hit on. The good way of making a struck joint is just to reverse the bad one—to weather the upright face of the mortar back, so that the

bottom edge of the mortar joint, and not the top one, is flush with the face of the wall. There is then no ledge on which rain can lodge. But many bricklayers object to weathered jointing like this, because, the top face of the mortar joint being cut in  $\frac{1}{4}$  in. or so, there is a line of shadow there in every course, and this shadow shows out both the natural unevenness of the brick arrises and the added irregularities, where they exist, of bad bricklaying. It is always possible, however, to get this work done in the right way, and the architect should never allow the other to be forced upon him. For *internal pointing*, a flat joint, with the face of the mortar vertical, and either flush with the bricks or sunk in about  $\frac{1}{4}$  in., is perhaps as good as any; but it is well, before deciding how to finish a large surface of walling, to have a few specimens of different joints executed on the wall itself. Some writers confine the term *pointing* to joints which have been raked out and are filled in subsequently, and call the striking of them at the time they are built *jointing*.

Careless bricklayers, and those who have been trained in "jerry" work, are often anxious to rub down or smear over their facings and arches so as to make them all one uniform tint. They are very artful, too, in hiding breakages, disguising clumsy mortar joints, and avoiding everything that requires skilful cutting and fitting by inserting lumps of mortar, or putty, or cement, coloured to imitate the bricks. These tricks are perhaps less prevalent now than they were 20 or 30 years ago, because recent developments of brick architecture have produced a class of really skilful bricklayers, whose example does something to discourage shams of this kind. A few years, or sometimes even a few months of wear, will expose them. The artificial arrises fall off, and show the fractures they were meant to hide. The composition mitres and stopped ends part company with the mouldings to which they were stuck, and the applied colouring of the facings—dead and monotonous from the first—turns into a mass of streaks and patches, which spread on to the mortar, stonework, and plaster. Where pressed-brick mouldings are used the contractor does not always order his mitres and stopped ends so soon as he should so. The manufacturers assure him that they can make them in two or three weeks. In practice they often take two or three months, and the prudent contractor will not depend on getting them sooner. He will order them, therefore, as soon as the contract is signed, and the architect must enable him to do so by supplying, at his request, all the necessary information. Mitres, indeed, can sometimes be cut out of the ordinary moulded bricks, even when they are "pressed," and unfit for rubbing. But this cannot be done with stopped or returned ends, and to execute them in "rubbers," as the foreman will perhaps propose, is simply to make every one of them an eyesore in the building. It is no part of the architect's duty to see that the contractor orders them, or any other goods in proper time; but it may hasten the progress of the works to remind him at the outset that it ought to be done. Where all the moulded work is cut and rubbed by hand, these difficulties do not arise.

As the walls go up, the architect who watches their progress may probably see a place here and there where a little extra strength is desirable. Then he will find the advantage of the provisions in the contract for "extra brickwork where directed," and "extra only in cement." But little is gained by laying bricks in cement unless the joints are solidly flushed up with it, and unless the bricks are really wet when the cement is applied. Every one of them should first be soaked in water for at least ten minutes, except in the case of vitrified and non-absorbent bricks, like "blue Staffordshire"; and even these precautions will avail but little unless the cement is used before it has begun to set. It is in pulling down his work—when this on any account happens to be necessary—that an architect really learns how it has been done. Now, in pulling down any piece of work which was built in cement some months or years before, it is a common thing to find all sorts of strange variations in it. At one point it will be exceedingly hard and strong; at another the cement will be about equal to good mortar; while somewhere else perhaps it will be quite perished and worthless. This generally means that the first specimen was done as it should be. The second was made up perhaps with dirty or loamy sand, or else the bricklayers allowed it partially to set, and then added more water, beat it up, and used it. In

the third case the probability is that the bricks were dry when laid. This is bad enough with mortar; but is simply ruinous with cement, and in all probability the use of dry bricks has been the secret cause of many accidents which judges, coroners, and juries have attributed to all sorts of reasons except the right one.

Where hollow walls are adopted, care is required to see that they are efficiently bonded by the wall-ties that have been specified, and especially to ascertain that the hollow is kept clear throughout its whole length and depth, from fragments of brick and rubbish of any kind which would conduct moisture across it. It is a serious question, however, whether inaccessible cavities of any kind are not, for sanitary reasons, things to be avoided. A hollow wall commonly costs as much as a solid one of the same thickness. Unless it is wider than a brick and a half in addition to the space, it is not as strong or as durable as the solid one, for either its outer or inner part consists merely of  $\frac{1}{2}$  in. work. This is too thin to carry with security the joists of a heavy floor and the weight of a heavy roof; and if it is put outside instead of in, it is too slight to bear for many years with impunity the jars and shocks, the rains and winds and frosts, which outside walls are certain to encounter. But the existence of the cavity itself is objectionable. Nobody knows what sort of rubbish, organic and other, may be lying at the bottom of it even when the building is first finished. Rats and mice, frogs and toads, may, and often do, get there in subsequent times, and die there. Gas mains may leak into it by leakages that are inaccessible, and therefore undiscoverable, or fungi may grow there, flourishing on the moisture that leaks through the outer surface, and then dying and decaying for generation after generation. All these things, as we know, may, and do happen, in the spaces between the lowest floors of buildings and the ground surface under them, and both walls and floors are porous, and allow bad smells and dangerous vapours to pass freely through them. It is a question, therefore, whether the ideal house is not really a house without inaccessible spaces, with no mouse-runs behind the skirtings, no cockroach colonies below the floors, no accommodation for dry rot or dead rats, or any of the other things which cause, at one time or another, mysterious smells and unaccountable illnesses even in buildings where sanitation, as far as it has got, is supposed to have done its best.

In careless work there are more and larger cavities than there is any excuse for, behind the window-frames, especially in bays. These should be filled up either with properly cut pieces of brick, or with cement concrete, made either with gas coke or brickbats broken up quite small. Besides the ordinary fauna of the floors and skirtings, these particular spaces are likely, in time, to be infested with starlings. These birds find their way into a house between the rafter ends and build there. Then they, or their half-fledged progeny, get down behind the sash-boxings and make desperate attempts to get up again. This, at best, is often the work of hours, and involves so much scratching and fluttering that the noise constitutes a serious nuisance. Both to keep out birds and to exclude draught, beam-filling should be very carefully done, the brickwork being carried up between the rafters, and the tiles or slates made good to it with mortar or cement. Flues need watching as they are built, or they may be full of sharp bends and of ledges which will hold the soot, even if they are not solidly filled up here and there, as some of the original ones at the Birmingham Town Hall are said to have been. Pavings, whether of brick, tile, or cement, need a better foundation than they frequently obtain. Without it they may look well enough when new, but in course of time they will sink unequally, and then, when water falls on them, instead of running off at the places intended, it will stand on them in pools. All pointing, injured by frost or otherwise defective, will have to be made good before the building is given up for occupation, and the pointing round sashes and door-frames should especially be seen to.

The works will not have gone on far before a certificate for payment on account is applied for. The conditions of contract probably state that the builder is entitled to receive from time to time a certain proportion of the value of the work done (often 80 per cent.), and that the architect is to certify what this proportion amounts to. This is a clause which, as it cannot in reason be interpreted very strictly, would be far better if it were

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not too strictly expressed. How is the architect—how is even the contractor himself—to know the exact value of the work which, at any particular moment, has been executed? The only way of knowing is to measure it up in detail and value it, a process which, from its tediousness and costliness, is quite out of the question. Yet in the ordinary form of contract the building owner and the builder agree together that the architect shall certify from time to time how much money is due under this particular clause, as if it were the easiest thing in the world to ascertain the precise sum that is due. In its origin, this is probably a lawyer's clause. The legal profession knows nothing of the tedious processes of taking measurements, squaring or cubing them, abstracting them, bringing them into bill, valuing them at schedule prices, cashing them out and adding them up to ascertain the total. It may naturally suppose that an architect has only to open his eyes and look at a building, whether finished or unfinished, in order to see at once how many pounds, shillings, and pence were needed to make it what it is. It must have been such a supposition as this which first suggested the clause, and it is such a supposition which, when the question comes before the law courts, makes them hold an architect responsible for giving his certificate with exactness. As a matter of fact, exactness in the amounts of certificates—excepting the final one—is unattainable. They are estimates—judgments—the best guesses which the architect can make after informing himself of, or recalling to his memory, all the main facts of the case. While the contractor goes on properly with his work slight inaccuracies in the amounts of certificates are scarcely heard of. But if he breaks down—goes into the bankruptcy court, or otherwise fails to complete his contract—the architect who has over-certified will find himself unpleasantly situated. The inferences are, first, that the conditions of contract should allow something for the fallibility of an architect's judgment in estimating the amounts for his certificates; and next, that the architect himself should be extremely careful never to over-certify.

## CONCERT-HALLS AND ASSEMBLY-ROOMS.—XXXII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

I HAVE now to deal with a class of buildings which have to serve the purposes of both healing establishments and of places of amusement. I refer to these buildings known as hydro-pathic institutions or spas in our own country, and as the "kurhaus" on the Continent. These buildings are erected partly for the accommodation of those wishing to undertake a course of water-cure, and partly for social intercourse and recreation or as general pleasure resorts.

Beyond the actual bathing establishment the visitor expects a good assembly-room, concert-hall, promenade, and covered colonnades for exercise in wet weather, ball, billiard, and reading-rooms, and, in many cases, even a theatre—in fact, all the pleasures of the town transferred to the country; and it is the object of the proprietor, and the duty of the architect, to fulfil all these demands and make the establishment a popular and profitable concern. This, it will be seen, will largely depend on the architect's skill.

The building itself sometimes takes the form of a place for public assembly, with the water-cure establishment attached: at others, it consists of a huge hotel, with all the adjuncts of the assembly-rooms and bathing establishment. The former class is the older form, and was well supported by our forefathers as a place of fashion. Perhaps the best instance of this description is the famous pump-room at Bath, and, indeed, the whole town was at one time entirely supported by the visitors who either required a "cure" or who wished to follow the fashionable crowd. The latter of these two classes is represented by our large hydro-pathic establishments. When situated in France these establishments are all included under the very comprehensive name of casino.

On the Continent, added to the buildings containing the guests, are the promenades, colonnades, and assembly-rooms, which are sometimes closely connected to the "kurhaus," and at others are self-contained buildings, forming an approach to the drinking halls and wells. Here, in the daytime, the visitors meet for walking or conversation, and, in the evening, for balls, concerts, lectures, besides all manner of theatrical entertainments.

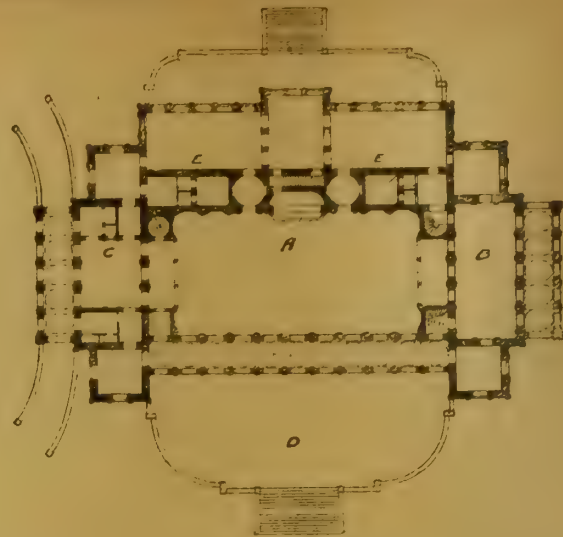


FIG. 1. A, concert-hall; B, dining-room; C, vestibule; D, terrace; E, card and reading-rooms.

Before dealing in detail with this interesting and complex group of buildings, I wish to impress upon my readers that, from the fire and panic standpoint, these large assembly halls must not be excluded from any of the stringent rules as to planning and construction upon which I have so frequently dwelt, both in the pages of this journal and elsewhere. It will at once be seen how great ought to be the care exercised in this matter, when we consider that, in addition to the dangers of the temporary stage, with its attendant flimsy appurtenances and often amateur management, we have hundreds of people sleeping in the building of which the hall forms a component part. It must not be forgotten that statistics of fires show us that they frequently break out after,

3. The spas and assembly-rooms, with theatre and card-rooms attached.

4. The casinos and gambling places, with the adjuncts of the "water-cure" and mineral wells.

The object of all these buildings, however grouped, is practically the same; they are, of course, planned differently, in accordance with the different sites, local conditions, and requirements. In all cases, however, they should contain a saloon or assembly hall for social gatherings, large fêtes, bazaars, balls, and concerts: it is necessary, therefore, that provision should be made for an orchestra, and the usual large platform, which should be such as may be easily adapted to the many and varied purposes for which it is likely to be required; perhaps the rooms next in importance will be the reading-room, billiard-room, and card-rooms. In addition to these there must, of course, be the necessary ante-rooms, lavatories, cloak-rooms, and attendants' rooms.

A café and restaurant, with the necessary kitchens and service-rooms, very frequently find a place, as I have before remarked.

The terraces, halls, promenades, &c., have already been referred to, and the hotel buildings follow very much the grouping of an ordinary hotel, and would naturally be discussed when dealing with these latter.

A characteristic of the French Etablissement de Bains is the provision of a stage in the assembly-room for various theatrical entertainments, or even the erection of a building which forms part of the group, and is entirely devoted to these performances—in fact, a regular theatre, intended principally for the use of the guests themselves in amateur performances, but also sometimes used by professional travelling companies.

The want of a proper and efficient stage has been much felt at many of the German hydro-pathic establishments, and it is only of late years that one has been erected in the concert-room attached to the kurhaus at Ems, where it has been found to add greatly to the popularity of that famous watering-place.

With regard to the planning of these buildings, it may be taken generally that on the Continent there are two principal types of ground plans adopted; these may be termed: (1) the central plan; (2) the elongated plan. The former of these two is more popular in Germany, Austria, and Switzerland, while the French seem to prefer the latter. Both these forms are naturally more noticeable in the smaller buildings than in the large groups.

In the first illustration I have selected, the detached or isolated "kurhaus" is planned on the central system—it is that of the kurhaus at Ischl. Here the large concert-room or public hall is situated in the midst, with terraces, halls, and colonnades on the park side, while on the other side, grouped round the saloon, are the entrance-hall, porters' and service-rooms, reception, cloak, reading, and billiard-rooms, together with a smaller, which is useful for various purposes when the central or large hall is either engaged or unsuitable because of its size.

The concert-hall goes the entire height of the



FIG. 2.—A, concert-hall; B, café; C, refreshment-room; D, billiard-room; E, retiring-room; F, reading-room; G, ladies' retiring-rooms.

sometimes long after, the stage is empty and the hall shut up for the night, so that the dangers to the inhabitants of the boarding-house or hotel in connection with the assembly-rooms are well-nigh without limit. This consideration causes me to fix one rule, which should, in my opinion, never on any account be relaxed, i.e., that in all cases the assembly-hall should be well separated from the inhabited buildings by solid construction or open air-space.

In the recent developments of hotel building the assembly-room has become a necessity, as competition demands its inclusion in every large hotel, whether in town or at a pleasure resort; but its addition to the building is very seldom looked upon as a great fire risk.

Considering these buildings, in connection with their special objects, we may group them as follows:—

1. Spas and assembly halls altogether separated from the wells.
2. The spas, in connection with pump-rooms, promenades, bath-houses, and often hotels.



building; but the adjoining rooms are lower, and have offices, caretaker's-rooms, &c., over them. The kitchens and store-rooms are situated in the basement.

Fig. 2 is the "kurhaus" at Baden, in Switzerland, and if we compare the plans of this with that in Fig. 1, which we have just been discussing, the following features may be noticed:—The entrance-hall in the Baden example is at the back of the building, that of Ischl on the side, and the adjoining rooms are differently grouped. In Fig. 1 the orchestra is in the chief axis, in Fig. 2 on the cross axis.

In the Baden example cloak-rooms and lavatories are on the right of the entrance and a museum on the left, while between the café and the hall is situated a very popular portion of the building, viz., the buffet.

The cost of the Ischl building was 240 marks per square metre of the superficial area of ground covered, while that of Baden cost 276 marks. They were built in 1872 and 1875, and the architect of the former was M. Michel, of the latter M. Moser.

Quite a different arrangement is shown in the plan of the Ostend casino (a diagram of which appeared in Chap. XXX. of this series, in the BUILDING NEWS for Nov. 13 last, p. 692), although it may still be classed as "central." The chief hall is situated in the midst of the building, and from it there is a free and uninterrupted



FIG. 3.—A, billiard-room; B, concert-hall; C, main entrance; D, stage; E, reading-room.

view of the sea. Its domed roof, supported on columns, rises well above the surrounding groups of buildings. The superficial area of the hall is 2,500 square metres, and that of the ballroom 700; altogether, the entire building covers 7,200 square metres.

Instances of the elongated plan, so much used by French architects for this description of building, are shown in Figs. 3 and 4. As a general rule, the concert-hall occupies the middle of the block, while right and left are planned the various other rooms in the form of wings, connected with the main building by long corridors.

Fig. 3 is the casino at Plombières, built in 1879 by the architect, M. André; this is a simple example of a well-known French "kurhaus." The length of the block is 90 metres, while the width is 13 metres. The reader will see from the illustration that its chief features are the concert-hall and theatre combined, which has accommodation for an orchestra of 40 performers (this is one side of the vestibule), while on the other are found the reading and ladies' room and the billiard-saloon.

The casino at Andona (Fig. 4) was built from designs by Messrs. Hédin and Quellain, and is of the French type I referred to, having the large concert-hall and theatre for its central feature, and the minor rooms placed in the wings on either side.

With regard to our own country, a German writer expresses himself in rather curious terms when referring to the requirements of the English people in a seaside assembly-room. He remarks that we in this country have no desire for a social life when visiting our health resorts; that we live

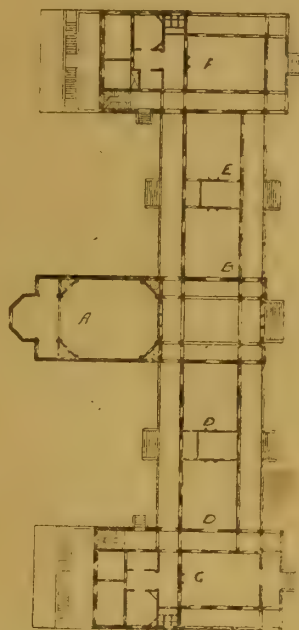


FIG. 4.—A, hall; B, billiard-room; C, restaurant; D, card-rooms; E, café; F, reading-room.

there in private houses very much as when we are at home, and that there is, therefore, no need of the multifarious rooms so universal at the Continental "kurhaus." He says that, if any large building is erected, it is mostly for the use of men, and is without provision for the accommodation of ladies. The same writer, however, informs his readers that we do possess a spa at Scarborough, which includes a large concert-hall and winter garden, besides most of the accommodation usual in Continental health resorts.

#### THE TIMBERS OF AUSTRALASIA.—XVI.

By "J. G." ("DE LIBRA.")

THE SOFT WOODS (concluded).—IV. THE AUSTRALIAN BRUSH TIMBERS.

ON reference to the table given in the immediately preceding article, it will be seen that, with scarcely an exception, the whole of the brush timbers of Australia there enumerated belong to the eastern portion only of the continent—viz., to the colonies of New South Wales and Queensland. Hence one of the most noteworthy timber exhibits at the Centennial Exhibition held in Melbourne in 1888 was a slab, about 5ft. square, of what was called parquetry, but would more appropriately have been designated marquetry, displaying two or three different designs of fillings and borders, beautifully executed in miniature, in the ornamental woods of New South Wales, that would be suitable for the richest parquetry flooring. The exhibit now adorns the staircase of the Sydney Technological Museum, and serves well to indicate the exceeding beauty of the Australian ornamental timbers (chiefly brush timbers) and their applicability to purposes of decorative construction.

##### A.—THE "CEDAR" GROUP.

Of all the building (as distinguished from engineering) timbers which Australia yields, none possesses such unchallengeable excellence for joinery and similar purposes as the red cedar, usually called simply cedar (*Cedrela Australis* or *toona*; Nat. Or. *Meliaceæ*). For generations it has been the chief wood used in Sydney and many other places for staircases, doors, &c., and the distinguished appearance imparted to the better class of houses by the massive (and often handsomely carved) newels, handrails, &c., of the stairways makes some amends for the architectural defects which these abodes too frequently display. The Australian "cedars" have no affinity whatever, botanical or otherwise, with either the true

cedar of Lebanon or the woods employed—several species of the juniper—in the manufacture of lead-pencils.\* These all belong to the Natural Order *Conifera*; whereas the Australian cedars are included in the same Order as the West Indian mahoganies, which they closely resemble, except in their much lighter weight, the grain of the red cedar being often as fine as that of Spanish mahogany, while the wood works as easily as Michigan pine. Considering what has universally been known in Australia of this splendid timber for very many years, it is astonishing to find it dismissed, so recently as in 1894, in Laslett's "Timber and Timber Trees" (page 251), in three lines, as "well known and valued in New South Wales and Queensland," and described elsewhere (page 209) as "the toon of India. . . which yields timber 11in. to 26in. square, and 14ft. to 40ft. in length." As a matter of fact, the red cedar of Australia attains an average height of 150ft., with a diameter of 6ft., which dimensions frequently increase to 180ft. and 10ft. respectively. In the Sydney Technological Museum one of the specimens, cut near a fork of the tree, is 8ft. across, and displays the very highest beauty in the markings; while some time ago, Messrs. Burns, Philip, and Co., the well-known shippers, despatched as agents for the North Queensland Timber Company, which deals exclusively in cedar, a single log 40ft. in circumference, containing 5,000ft. of timber, and weighing eight tons; and a 10ft. wide tree, felled in New South Wales, was estimated to yield 30,000ft. of valuable stuff. So long ago as 1862, the jurors of the London International Exhibition reported that "a sideboard made of veneers of root pieces of this timber is of astonishing and perfect beauty, and resembles a rich marble." When, therefore, "Laslett" is next re-edited or revised, it might be well for whoever may be intrusted with the task to consult the mass of Australasian timber literature existing, instead of relying on the "intelligent sawyer who has been for many years employed in the colony" (Qy., in which of the seven colonies?)† As regards the red cedar, however, the Victorian Timber Board gives, as the average of the New South Wales specimens tested, the following figures:—Specific gravity, 0.508; weight per cubic foot, 31.71lb.; breaking weight, 495lb.; deflection, 4.54in.; average specific strength, 1,353. In Laslett's Table CLXVII., the specific gravity of Cuba mahogany figures as .768; so, as will be seen, the cedar is more than one-third lighter, while its beauty of grain and colour, its well-established durability, and its ease in working (whether in joinery or cabinetmaking) are so well known in Australia, that to any resident it seems almost idle even to allude to them. In the Public Library of Sydney, where these lines are written, the whole of the interior fittings and furniture of every description are of this wood; and special mention was made in these columns last year of its admirable employment in the new Sydney buildings of the Mutual Life Insurance Company of New York. Its enormous local consumption has greatly diminished the immediately available supplies of New South Wales; but there has been extensive replanting within the last few years, while in Queensland millions and millions of feet are still standing, and large supplies are now coming from the adjacent country of New Guinea. To English

\* A specimen of Queensland cedar was sent last year by the Department of Agriculture to Johann Faber, of Nuremberg, who, however, found it unsuitable for the purpose, as might have been expected.—D. L.

† Nothing can be better deserved than the strictures which appear in "Laslett" in several places (such as the foot-notes to page 254) on "the flagrant looseness" of the vernacular timber nomenclature on the part of "our Australian colonists." Yet the reviser of this standard work accepts the information of one of those very "sawyers" who are responsible for this "flagrant looseness," though the foot-note at page 248 states that "unfortunately the value of this list" [Table XCVII.] "is diminished, owing to the vague popular names only being given." The particulars offered in the list in question differ in various instances altogether from the authoritative statements of such admitted scientific experts as Baron von Müller, Messrs. Maiden, Arvid Nilsson, and others; and when they are not seemingly erroneous, they are often valueless, if not misleading. With reference to cedar, at the very time the 1894 edition of "Timber and Timber Trees" was in course of preparation, an exhaustive account of that timber appeared in the official *Agricultural Gazette of New South Wales* (August, 1893), a perusal of which will dispel the supposition that the red cedar of Australia is of no greater value than the toon of India, though they appear to be botanically identical, and the difference between them may well be attributed to the difference in soil and climate. Baron von Müller, however, asserts that the Australian tree should be called *Cedrela Australis*, and that appellation is now generally superseding in the colonies the older Indian name of *C. toona*.—D. L.



architects and builders I can unreservedly commend the employment of this grand timber and some of its nearest allies.

The rosewood (*Dysoxylum Fraserianum*—Nat. Or. *Meliaceae*) like some of the other *Dysoxylons*, is frequently called "pencil cedar," from a certain resemblance to the Bermuda cedar (or juniper) wood employed in pencil-making. But it is really more like Honduras mahogany, which it greatly resembles, and may well replace. Its proper English name is due to its rose-like fragrance when freshly cut. It is a very much smaller tree than the cedar, its height and diameter rarely exceeding 80ft. and 48in.; but the timber is greatly valued for all the purposes for which cedar is applicable (though it possesses little grain), and also for ship-building, carving, and even wood-engraving (as it is harder than cedar). It varies a good deal in depth of hue. Some specimens I have seen were almost pink, while others were nearly as deep in tone as the rosewood used by English pianoforte makers. The fittings of the Government architect of New South Wales' own office, if I remember rightly, are of this wood. The supply is practically unlimited, and this valuable timber will become more appreciated as the cedar supplies grow scarcer. It is not, however, a great favourite with joiners, as it is a little "woolly," and does not very readily take the glue.

The red bean (*D. Muelleri*) resembles both the preceding timbers in character, and attains about the same dimensions as the latter. It is usually lighter (though brighter) in colour than cedar, and, though much less rich in grain, has sometimes a more silky lustre. It is an admirable joinery and cabinet wood, and was employed, as I mentioned at the time (see Vol. LXIX. p. 70), for the office fittings of the Equitable Life Assurance Society of the United States' fine Sydney building, where, I believe, it has stood perfectly.

The bastard pencil cedar (*D. rufum*) is another timber of the same character, but of much smaller dimensions. The wood is nicely grained, and answers excellently for cabinetwork.

The white cedar (*Melia composita*—Nat. Or. *Meliaceae*) grows to 50ft. in height, with a 24in. diameter. The timber is a pale yellowish brown, which polishes to a rich warm colour, and the grain is coarse, somewhat like that of oak, and often handsomely marked. The wood weighs from 30lb. to 38lb. per cubic foot, and is soft and easily worked, though not particularly strong. Its durability has been disputed, but is no less strongly championed, "green or seasoned," by those who should be authorities.

Onionwood (*Ocotea cepipodora*—same N. O.), which, singularly, finds mention neither in Maiden's "Useful Native Plants of Australia," nor in Arvid Nilson's "Timber Trees of New South Wales," though it is described by Baron von Müller, and may be seen at the Sydney Technological Museum, is another useful furniture timber of the cedar class, extremely plentiful in the brush forests about the northern rivers of the mother colony. The wood is of a rich brown colour, with a very peculiar figure, which I can best describe as reminding one of the fret-like undulations sometimes employed by the Japanese for decorative backgrounds, and which should look well under polish.

The light yellow wood (*Flindersia Ozleyana*, same N.O.) attains an extreme height of 100ft., and extreme diameter of 42in. It is a strong, durable, and fine-grained timber, valuable both for boat-building and cabinet-work, and, indeed, for most of the purposes to which cedar is applied. It likewise carves well. It is of a clear yellow colour, not unlike raw sienna, and I have seen it sometimes splendidly figured.

The dark yellow wood (*Rhus rhodantha*—Nat. Or. *Anacardiaceae*) grows to 70ft., with a 24in. diameter. The wood is sound and durable, soft, fine-grained, satin-lusted, and beautifully marked, and is deservedly esteemed as one of the handsomest of furniture timbers. When first cut the colour is a light buff brown, or yellowish bronze, which darkens with age to a rich golden brown. It is tolerably heavy, weighing about 48lb. to the cubic foot.

#### 3.—THE SILKY OAK GROUP.

Whether named from the silky appearance of the underside of the leaves or of the wood when freshly cut, the "silky oaks" have no relationship with the scrub oaks, or "she-oaks" (already dealt with) beyond some resemblance of the grain, in both cases, to that of English oak.

The three most important of the silky oaks are *Grevillea Hilliana*, *polyotrya*, and *robusta* (Nat. Or. *Protaceae*), to the latter of which species the vernacular name was till lately considered to apply exclusively. All three timbers are of a very light warm brown colour, hard, durable, elastic, and beautifully marked. For cabinet-work and veneers the first named is the most valuable, but for interior fittings and joinery the last, on account of its larger growth (with a height of 80ft. and a diameter of 36in.) and its greater compactness. The experiments made at the Sydney Mint in 1860 give the specific gravity as .564 (equivalent to 35lb. 4oz. per cubic foot), and the weight of the specimens exhibited in London in 1862 was respectively 36lb. 2oz. and 38lb. 14oz. per cubic foot. Unfortunately, the extensive employment of this fine timber for the staves of fallow-casks has considerably diminished the supply, though, happily, another silky oak, belonging to the same Natural Order—viz., *Orites Excelsa*, strikingly similar and botanically closely allied to *G. robusta*—indeed, almost identical with it, except in its reddish hue, whence the absurd designation of "red ash"—is very abundant, and may, in most cases, well replace it.

Beefwood, or red silky oak (*Senecarpus salignus*, same N.O.), attains a height of 50ft., with a 24in. diameter. It is one of the most beautiful of the *Protaceae* timbers, of a pale brownish-red colour, with an exquisitely delicate close grain, the undulating figure perfectly uniform, of hard texture, rather heavy (about 44lb. per cubic foot), but easily worked. It is a most valuable furniture wood.

The scrub silky oak (so-called, though a brush timber) or white maple (*Villarsia Moorei*—Nat. Or. *Oleaceae*) attains an extreme height of 120ft., with a 6ft. diameter, and a height of about 41lb. per cubic foot. It is an excellent wood, white in colour, close-grained, beautifully figured, durable and working well, and would be eminently adapted for the manufacture of suites of bedroom furniture.

The native pear (*Xylomelum pyriforme*—Nat. Or. *Protaceae*) yields timber weighing 46lb. per cubic foot, of a dark colour, and often finely mottled (especially when cut at right angles to the medullary rays), though somewhat coarse in the grain. It is employed in ornamental cabinetwork, both in the solid and as veneers.

#### C.—MISCELLANEOUS BRUSH TIMBERS.

The native plum (*Achras Australis*—Nat. Or. *Sapotaceae*) attains a height of 100ft., with a 36in. diameter, and a weight of about 56lb. per cubic foot. The timber is close-grained, firm, beautifully figured, and of a light yellowish-brown colour. It is used for general building purposes, and is eminently suitable for cabinetwork, but it requires careful seasoning.

The red ash (*Alphitonia excelsa*—Nat. Or. *Rhamnaceae*) often reaches to 100ft., with a 24in. stem, and has a weight of 55lb. per cubic foot. The timber is hard, firm, tough, close-grained, and durable, but warps in drying. The sapwood is white or pinkish, and transversely figured; the heartwood is parti-coloured or dark brown, or rather, in the specimens I have seen, of a full brick-dust colour under the high polish which it takes—a hue that should make it valuable for joinery and cabinetwork, used in conjunction with the "old" tinted fabrics now so extensively employed in decorative upholstery. In the colonies this timber is used for a large variety of purposes, and the publication of a fresh official account of it is expected as these lines are written.

The Union Nut (*Bosistoas sapindiformis*—Nat. Or. *Rutaceae*) is only a small tree, but it furnishes a wood which, though liable to split in drying, is (when properly seasoned) extremely suitable for cabinetwork, on account of its yellowish light brown colour, its fine, close grain, its beautiful markings, and the ease with which it works.

The black bean (*Castanospermum Australe*—Nat. Or. *Leguminosae*), which reaches a maximum height of 130ft. and a diameter of 5ft., is a splendid timber for interior fittings and solid articles of furniture (sideboards, wardrobes, &c.), for which it has lately been coming into greatly increased demand. The wood is soft, fine-grained, and very like walnut (for which it is considered a colonial substitute), only darker, more pitted in appearance, and more showily veined. It shrinks in drying, and requires to be thoroughly seasoned: otherwise it is not durable. But it dresses to perfection—more easily even than cedar—though, being of a somewhat greasy

nature, it does not as readily take the glue as joiners like. The timber was most favourably reported on by Mr. Allen Ransome at the Colonial and Indian Exhibition.

Lightwood, or coachwood (*Ceratopetalum apetalum*—Nat. Or. *Sacifrageae*), grows occasionally 130ft. high, with a 24in. stem. It is a light brown timber, sometimes figured transversely, fragrant, soft, light, and close-grained, but extremely tough. It is used extensively by joiners and cabinetmakers, and particularly by coach-builders; it is also said to be peculiarly adapted for the sounding-boards of musical instruments.

The white sycamore (*Cryptocarpa obovata*—Nat. Or. *Laurineae*) likewise reaches to a maximum of 130ft., but with a 5ft. stem, and a weight of 35lb. only per cubic foot. It yields a soft whitish wood, which becomes darker with age, and is durable when not exposed to the weather. It works admirably, and is a most useful timber for cabinetmaking and other purposes.

The native tamarind (*Diploglottis Cunninghamii*—Nat. Or. *Sapindaceae*) attains a maximum height of 100ft., with a 3ft. stem, and a varying weight (at the London Exhibition of 1862) of from 38lb. to 50lb. per cubic foot. The timber is whitish or flesh-coloured, close-grained, firm, and fairly strong and durable. It has a very pretty end grain, but does not dress well on it, though it does so excellently on the face. It is a valuable cabinet wood.

Corkwood (*Duboisia myoporoides*—Nat. Or. *Scrophulariaceae*), so called from its bark resembling that of the cork oak, is a small tree, yielding a soft wood with a beautifully fine grain, and of a light colour, which becomes yellow under polish. The weight is about 30lb. only to the cubic foot. It is satisfactorily employed both for wood-engraving and wood-carving. The end grain is very difficult to work, but the face-grain readily gives a clean surface, and colonial wood-carvers speak of the wood in terms of eulogy.

Maiden's blush (*Echinocarpus Australis*—Nat. Or. *Tiliaceae*) is named from the delicate rosy hue of the wood when freshly cut, which, however, soon fades into a light yellowish brown. Its maximum height is 150ft., stem 4ft., and weight per cubic foot 39lb. The timber is soft, durable, and easily wrought, and is well adapted for many cabinet and ornamental purposes.

The blue fig (*Elaeocarpus grandis*, same N.O.) reaches to 100ft., with a 36in. stem. It is less used, even in the colonies, than it ought to be, for it is soft and easily worked, with a fine grain often beautifully figured, and acquires a very pretty yellow colour under polish.

The prickly fig (*E. pelopetalus*) is a rather smaller tree, which furnishes a timber very similar to the last, though whiter, and of a plainer grain. It is a good joiner's wood, and Baron von Müller speaks of it as "exquisite for cabinetwork."

Teak (so-called *Endiandra glauca*—Nat. Or. *Laurineae*) grows to 100ft., and 24in. diameter, and is considered a very valuable timber, though it appears to have been employed only to a limited extent for cabinet and ornamental purposes. Yet the wood is close, hard, and firm in the grain, with a dark coloured and often very handsome duramen.

The bastard sandal-wood (*Eremophila Mitchelli*—Nat. Or. *Myroperineae*) is quite a small tree, but yields a beautifully grained, brown, very hard, and very fragrant wood, with the characteristic sandal odour. It affords handsome veneers, and should be useful for wood-engraving.

Plumwood (*Eucryphia Moorei*—Nat. Or. *Saxifrageae*), not to be confounded with *Achras Australis*, and often called "Acacia," from its resemblance (when not in flower) to some of the wattles, but more generally known, perhaps, as "white sallow" or "white sally," is a moderate-sized tree furnishing a beautifully clear and tolerably hard wood of a light-brown colour, and free from knots. Its chief colonial use is for the framework of carriages, but carpenters say that it dresses superlatively.

Negro-head beech is a timber respecting which everybody seems to be still at loggerheads—"Laslett," the Victorian Timber Board, Messrs. Maiden, Arvid Nilson, the Curator of the Sydney Technological Museum, and others. It appears to me that there is only one timber of this name, though it is called also "evergreen beech" and "myrtle" in Victoria and Tasmania, and is known botanically as *Fagus Cunninghamii* (Nat. Or. *Cupuliferae*) in those colonies, but as *F. Morei* in New South Wales; and that the remarkable difference in the specific gravity of different



specimens is accounted for by the difference in latitude of the timber's habitation. At all events, what is generally called negro-head beech is (for a wonder, and unlike *Gmelina Leichhardtii*) a true beech, very nearly allied to its English congener. It usually grows from 100ft. to 150ft. high, with a stem diameter of 4ft., though it exceptionally attains the dimensions of an 8ft. diameter and a height of 200ft., with an 80ft. stem up to the first branch. It is a most valuable timber, and is highly prized for all descriptions of light joinery. The wood is hard, firm, close-grained, but richly coloured, and the warty protuberances on the trunk of the tree afford a beautiful figure for cabinet purposes. The timber is very abundant, and can be obtained in unusually large fitches in almost any quantity.

Quandong (*Fusanus acuminatus*—Nat. Or. *Santalaceae*) is a species of the genus to which belongs the West Australian sandal-wood (*F. spicata*). It is but a small tree, but it yields a hard, close-grained, handsome, flesh-coloured wood which works splendidly, and is equally suitable for cabinet-making, wood-carving, and wood-engraving.

The tulip-wood (*Harpullia pendula*—Nat. Or. *Sapindaceae*) attains a height of 60ft. and a 24in. diameter. It yields a firm, strong, close-grained wood, beautifully marked with various hues from yellow to black, easily worked, taking a splendid polish, and therefore invaluable as a fancy furniture wood. The outer (and lighter-coloured) wood is very tough, and considered exceptionally good for lithographers' scrapers.

The native olive, or marble-wood (*Olea paniculata*—Nat. Or. *Jasminaceae*), has a 70ft. height and a 24in. trunk. It furnishes a hard, tough, close-grained, and durable timber of whitish colour, darkening towards the centre, and with the heartwood prettily marked.

The musk (*Oleoria Argophylla*, or *Aster Argophyllus*—Nat. Or. *Compositae*) is a stout and sturdy tree, though in height it rarely exceeds 30ft. The timber is fragrant, and of a beautifully mottled-brown colour, with a weight of about 40lb. per cubic foot; works well, and is therefore a most valuable furniture wood. The mottling of the butt and rootstock, in particular, is often exquisite, and, when carefully polished, not surpassed by either the finest English walnut or pollard oak. I would therefore strongly recommend veneers of musk-root to the attention of English cabinet-makers. Muskwood may be had in any quantity—the stem in slabs 18 to 36in. wide.

In Laslett's "Timber and Timber Trees," 1894, p. 256, I find the *Panax Murrayi* (Nat. Or. *Araliaceae*), which is called "pencil wood" in southern New South Wales, described as "cutting splendidly for lining-boards." Against this statement, I think it right to quote the character given to this timber (in common with the other species of *Panax*) in the New South Wales Surveyor-General's Office, and accepted by the Forest Conservancy Branch of the Department of Mines and Agriculture, which is comprised in three words—viz., "soft and perishable."

The native laurel (*Pittosporum undulatum*, Nat. Or. *Pittosporaceae*) is a slender tree, with a stem of only 12in., though frequently a height of 50ft. It furnishes a hard white timber—one of the most homogeneous of the Australian woods—with a fine clear grain, resembling a mosaic of sand. When thoroughly seasoned, it is a valuable wood for turnery, wood-carving, and wood-engraving. The Lignum Vitæ of Eastern Australia (*Vitex lignum-vitæ*, Nat. Or. *Verbenaceae*) attains a height of 70ft. and a diameter of 24in., yielding a close, hard-grained, valuable timber, of a blackish colour, which is said never to shrink in drying. It is largely used for the decks of vessels and for semi-external floors (such as those of verandahs) destined for hard wear and rough usage, and it is also valuable for certain cabinet-making purposes.

Such are the timbers, hard and soft, which I consider the most important and suitable for export from Australasia, and for employment in Europe and elsewhere. Many others there are—dozens, nay scores—possessed of various valuable qualities, which will come to be better known and appreciated in the course of time than they are at present; for scarcely a week passes that new timber specimens (especially of the New South Wales soft woods) are not received at the Sydney Technological Museum, some of which are seemingly of the highest excellence. But it would have been impossible to say more in the present series of articles, which, in 1891,

have reached considerably greater length than I supposed would be necessary when they were first projected. Should they, however, prove the means of drawing increased attention to the marvellous timber wealth of Australia, and of affording some greater knowledge than generally exists at present of material which in the future will assuredly find large employment in the northern world at the hands as both the architect and the decorator—in engineering, in building, and in cabinet-making, as well as in various other callings to which the BUILDING NEWS appeals perhaps somewhat less particularly—the object of the writer will have been served. The foregoing matter is put forward with the deference which becomes one who has little claim to be regarded as a professional authority or expert upon timbers; nevertheless, it is believed that, in view of the large amount of time and pains that has been expended during many months in comparing (and, where possible, reconciling) the often conflicting information and statements afforded by admitted experts, as well as in the actual specimens of many of the woods mentioned, few inaccuracies of moment will be found hereafter, notwithstanding the confusion which still exists in the knowledge and nomenclature of the Australian timbers. To those who may have occasion, or the desire, to pursue the subject further, I recommend the following works, to which (among many others) I have myself been largely indebted in the preparation of these articles—viz., the exhaustive scientific and illustrated folio, "Forest Flora of New Zealand," by Professor R. Kirk, F.L.S., of Wellington College, N.Z., late Chief Conservator of State Forests of the Government of New Zealand, and the practical octavo volume, "Useful Native Plants of Australia," by Mr. J. H. Maiden, F.L.S., F.C.S., who, in addition to his several Government appointments, now holds the distinguished position in the southern world of science of President of the Royal Society of New South Wales.

#### HEATING AND VENTILATING OF THE HORTICULTURAL HALL, PHILADELPHIA.

IN the rebuilding of the Horticultural Hall, Philadelphia, the most perfect arrangements for a building of this kind have been carried out. The new building, located in Broad-street between Locust and Spruce-streets, has replaced one destroyed by fire. No expense has been spared in the details and mechanical equipment. In the mechanical heating, ventilation, and electric-lighting plant Messrs. Travers Bros. and Jellett, consulting and contracting engineers, were engaged. Details and plans of the plant and arrangements have been given in the *Engineering Record*, from which we gather that in the basement is a large room, with its toilet-room for the use of the Florists' Club, and in the rear are the engine, boiler, and dynamo room. Above is a lecture-room, cloak and toilet rooms for ladies and gentlemen, and in the rear is an entrance and stairway to the upper floors. The main exhibition hall is on the second story, and occupies half the area of this floor. The floor is devoted to purposes of assemblies, receptions, private entertainments, &c.; also to ball-room, supper-rooms, and serving rooms. The building is heated by a combined system of radiators, and a blower system, with aspirating shafts and one exhaust fan; the former is used for heating the servants' stairway, toilet-rooms, rear hall, and some rooms on the third floor, the blower system being used to heat the remainder of the building. There is a 10ft. blower, driven by a 20H.P. engine, the fan being capable of making 275 revolutions a minute, and of supplying 40,000c.ft. of air per minute. The fresh air is taken from a shaft out of doors, drawn through a heating coil of inch pipe compressing 5,600 lineal feet, and divided into eight sections each of 700; each is separately valved. The chief delivery pipe divides into two mains, 36in. diameter, bifurcating into two branches, controlled by dampers. Two of these supply the main audience-hall on the second floor. "The heat flues are run against inside of outer walls, these being 'furred' out to cover them. All fresh-air flues for the rear part of building are carried up in a hollow space 11in. in the clear, and the same in the front portion of the building. These flues were erected against the outer walls before the inner partition was put up, which gives the full thickness and strength of walls for the support of the roof."

The exhibition hall has a volume of 209,931c.ft., and 24 supply flues, having a total area of 5,115sq.in. The air supplied is 21,000c.ft. per minute, giving six changes of air per hour. The total area of outlet-flues in the hall is 2,160sq.in. In the main audience-hall the fresh-air flues discharge above the wainscoting in front of the window; the discharge being straight upwards, not out into the room. The upper rooms are supplied in the same way. The ventilation is next described, which is by means of ducts to a shaft; the lecture-room, toilet, and cloak-rooms on first floor are ventilated through flues carried through to basement ceiling, where they connect with a duct 30in. diameter, containing an exhaust fan discharging into ventilating shaft at one corner of building. The other main rooms are ventilated by flues in a like manner. The flues are 6in. by 16in. each, and go up to the loft of building in two main galvanised iron ducts, leading to a central aspirating chamber. Other details are given in the *Record*, by which will be seen the elaborate nature and extent of the scheme that has been carried out.

#### TRAMWAYS AND ROADS.

IN these days of tramway locomotion in our large towns, the section of rails employed, and the influence of rails on paved roads, are details of much more importance than the local authorities are inclined to think. The history and evolution of the metal rail, as it has been used in the United States, are interesting. At first, with rough granite or trap block paving with wide joints, the surface railroad companies laid down rails which were followed by the traffic, as being easier in traction; but the result was to retard the railway traffic, and to prevent this a centre-bearing rail was adopted, the "Hewitt rail," which was intended to prevent vehicular traffic from following the lines of rails. The section of this rail was a raised flat-topped tread with shallow grooves on each side; but the suddenness of the projecting part made it very obstructive to horse traffic, and it has been disused in New York. Other modifications have been adopted with more or less success. Many "side-bearing" rails of girder section have been employed; but in some of them, owing to the vertical sides, it has been found hard to pull a loaded waggon out of the track, and it is also difficult to cross at a sharp angle. These sections of rails have been superseded by a grooved form, such as is used on Broadway, New York City. Several modifications of this section are in use, and are given in a paper by E. P. North, M.Am.Soc.C.E., read before the American Society of Civil Engineers. One of these grooved sections has been lately adopted by the Metropolitan Traction Company, and is said by Mr. North to be the best introduced in America. There is a good depth of groove for the wheel flanges, and the curved flange on one side allows vehicular traffic to pass over easily and carriages with narrow tires to get out. The section is not unlike an inverted high-heeled boot, the heel part being the vertical tread for wheel, and the sole of foot the curved flange. The authority we quote says, "The value of this rail depends on the fact that the slot is so narrow that the wheels of a truck cannot sink into it, and with the pavement just flush with the tread and flange there is nothing to keep a wheel on it, so not only will there be no difficulty in pulling out of it, but horses will not be constantly reminded by an increase of traction that it is their duty to follow the line of the rail." No waggon with a tire over 1½in. wide is inclined to follow it. Then there is the question of paving up to the rails. It is found that the wooden stringers rot, and let the rail down, causing a straight joint and rut for water to accumulate. The same authority says that for all girder rails of equal flanges, hard terracotta fillers moulded to the concave lines of the section, and set in cement mortar, give good bearing for the blocks. This question of paving next to the rails is by far the most urgent. Many of the English tram-lines are spoilt by the ruts made on each side, owing to the grinding of the sets at the edge of rails or the sinking of the latter. In asphalt roads the point is to keep the asphalt away from the iron rails, on account of the heat the rails absorb during a hot summer's day, and for this purpose granite toothing-blocks are laid, or a steel plate about 3ft. wide punched and roughened on the surface. If engineers could turn their attention to this great need, a con-



siderable step in our tram-line roads would be made, and repairs to paving and rails rendered less frequent.

## WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—VI.

By JOSEPH HORNER.

THE chemical composition and the physical characteristics of iron and steel are determined in those processes of manufacture which have been summarised. In a very general way the latter can be deduced from a knowledge of

FIG. 1.

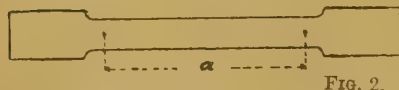
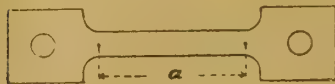


FIG. 3.



the former: but chemical analysis alone cannot tell the engineer all that he desires to know about steel and iron, about its precise strength and ductility, its behaviour under stress and strain under various conditions of working. These vital matters must be determined by testing. It is quite possible to have two steels which will yield the same chemical analysis, and yet, while one will be of first-class excellence, the other will be almost or quite worthless for its specific purposes. What the tests reveal must, therefore, now be considered.

The testing of finished structures occupies but a secondary place beside the testing of materials. There are structures, such as roofs, on which no test load can be imposed, and when dead load tests are made on girders, and rolling load tests on bridges, those are imposed with a view to observe the deflection and permanent set only, and to note weak points in workmanship, should such exist. They do not in any degree touch the problems of elastic or ultimate strength; these must have been before determined by the testing of small specimens. And, however complicated a structure may be, the designer endeavours to reduce by calculations all the compound stresses into those of an elementary character, so that each individual bar, section, and rivet has generally to endure a simple strain, the precise nature and extent of which are determinable, and to which dimensions are proportioned.

Very little scientific testing of iron was practised previous to the introduction of steel. Iron was accepted with little, often with no, guarantee of quality, and that quality deteriorated with the demand for cheapness. The early steel users complained of the stringency of the restrictions placed by official bodies upon its use by comparison with those placed upon iron. The limit of stress was fixed only slightly above that of iron,  $6\frac{1}{2}$  against 5 tons, and every plate and bar used had, and still has, to be tested. Hence the testing of iron and steel, but more particularly the latter, has assumed an importance of late years far exceeding that which it formerly occupied. The real testing era came in with the era of steel; it was forced upon engineers by the difficulties and uncertainties which attended the use of the early steels. It has now become very much cut and dried, and a good deal of unnecessary refinement is often made to surround a comparatively simple subject by academic writers in the matter of prepared test pieces, and minute records of behaviour beyond the elastic limit.

Test pieces are of two kinds—those prepared for use in a machine, and those for use at the forge. The first are shaped to exact dimensions, either by turning, planing, or milling. The latter are used just as they are cut off a bar or shorn from a plate. It is necessary to machine all test pieces which are pulled asunder in a machine, partly to obtain a testing section of uniform dimensions, but largely, also, in order to have a smooth surface free from cracks or angularities. In the case of forge tests machining is of

little moment, yet it is often well to take off rough edges by grinding before attempting to bend shorn specimens cold; but a practised eye can detect the quality of a steel in any case.

All testing of prepared specimens is done cold. Tests of rough specimens may be cold or hot; the former are costly when specifications are stringent, the latter not very costly. In the latter case tests can be made very rapidly on shearings or crop ends by a workman told off specially to attend to the testing, and there is no preparatory machining necessary. Under an extensive system, and having a plant laid down, the former does not involve great current expenses; but the plant and the system are costly, while to pay firms for testing is also expensive. But each method is essential; each reveals physical characteristics not observable by the other; each is recognised and demanded by the great inspecting bodies. To illustrate the relations of the two classes of tests the case of the Forth Bridge steel may be instanced. On this work one plate out of fifty, taken promiscuously, had a strip cut from it to be planed on all four sides and tested for tensile stress; the same proportion of bars was tested. But, for rough bending tests, every plate and every bar had a piece cut from it to be tested by bending to a radius of  $1\frac{1}{2}$  the thickness until the ends of the piece closed, and failure to stand these comprehensive tests was very rare.

The testing of specimens prepared to exact dimensions by shaping, for use in machines, is, further, of two kinds—one of scientific character, that in which the absolute physical characteristics of a given material are determined; the other that in which they are determined relatively to a given specified standard; the latter is that which is adopted by the practical engineer. This is a comparative method. It is perfectly well known how specimens of given materials of certain definite dimensions ought to behave under certain tests, and, therefore, these forms and dimensions are generally adhered to. Larger specimens would often be expected to indicate more surely the character of a plate or bar; but there are various objections to their employment, and the rule always is now to employ specimens of small dimensions.

Figs. 1, 2, 3 show the forms of ordinary tensile test pieces cut from plates. Fig. 1 is held with pin grips passing through the holes; wedge grips are used for Figs. 2 and 3. Fig. 3 costs less to prepare than Fig. 2. Fig. 2 is the usual form adopted by the Admiralty, and is prepared so that, for all thicknesses of plate, the section is about one square inch; the extensions are measured in a length,  $a$ , of 8 in. Test pieces of this form are sometimes made 2 in. wide and 10 in. in effective length. Fig. 4 is the usual form used for round rods; it is held in wedge grips. A form similar to Fig. 4 is also used, but threads are cut in the ends and fit into nuts, which are held in the grips. Fig. 5 is the German and Continental form. The effective length,  $a$ , of the Continental test pieces is 200 mm. = 7.874 in., nearly the same as those of the English Admiralty 8 in.

FIG. 4.

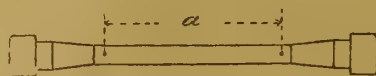
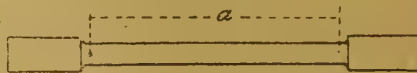


FIG. 5.



FIG. 6.

Fig. 6 is a form much used in America, the length  $a$  being, however, variable, from 2 in. upwards. Fine centre punch marks or pops are indented on a specimen at the definite distance on which the extensions are to be measured shown in each figure. Test pieces for compression, Fig. 7, are short, solid cylinders, about  $1\frac{1}{2}$  or 2 diameters in length. Test pieces for shearing, Fig. 8, are short cylinders grooved in two planes; those for torsion, Fig. 9, are short square bars turned down in the centre, the ends being left square for the grips; these are standard

forms, but for special tests bars of various dimensions and sections are made use of. The Steel Committee, 1868-70, experimented on test bars of iron and steel 10 ft. long between the gauge points, and the results were found to be much more uniform than tests of the same materials with very short bars; but the dimensions of test bars often affect the results very materially, quite apart from the mere influence of length, differences which can apparently only be due to differences in degrees of homogeneity. Thus, Sir B. Baker found that, while iron bars 16 ft. long, 10 in. wide, by  $\frac{1}{2}$  in. thick, gave an average tenacity of 19 tons per square inch, ordinary test pieces cut from the same bars gave stresses from 35 to 75 per cent. higher than the bars. So, too, some French bars cut from a single iron plate gave strengths varying lengthways from 20.32 to 29.31

FIG. 7.



FIG. 8.



FIG. 9.

tons, with extensions from 12.5 to 21.5 per cent., and crossways from 7.0 to 14.5 per cent.

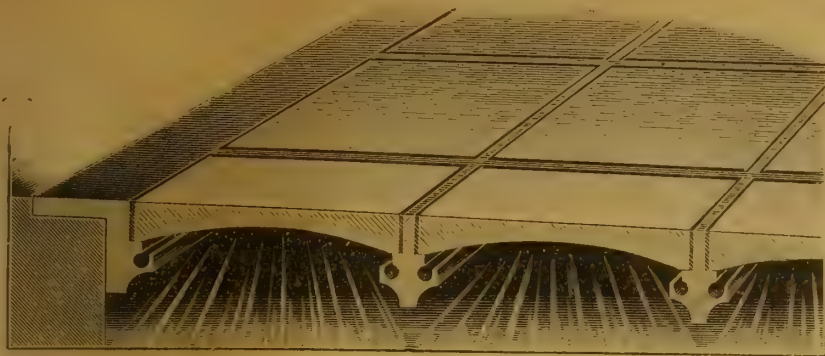
There are two very important facts which it is necessary to learn from the test pieces about a material before making use of it in a structure. One is its ultimate strength, the other is its elastic strength; in other words, its strength or capacity to resist fracture, and its capacity to resist permanent set or crippling. Beyond the elastic strength, again, there is the question of ductility, which measures capacity of a material for extension before fracture. The strength of wrought iron and steel is subjected to stresses which tend to produce failure in various ways—by tension, by compression, by cross breaking, and by shearing. The first two are direct, the others transverse. The tensile stresses are of a simple character, being proportioned to the cross section; the strictly compressive seldom come into play absolutely in structural work, because the compressive members are too long to be crushed; they would fail by a crippling action, hence stiffeners and riveting are usually resorted to to reinforce such members. The cross-breaking stress is not of a simple character, and is usually calculated from the moment of inertia of a section, which is a function of the depth and cross sections; the shearing stress may be simple, or it may be complicated with other stresses. The simplest and most familiar case which can occur is that of a pin entering the eyes of tension rods.

Further, always in tests of wrought iron it is necessary to know the strength and ductility both lengthways and crossways of the grain. In the earlier specifications for steel, also, this distinction was generally inserted; but it is seldom done now, the strength being understood to be equal in both directions.

The tensile is by far the most important test of all, in this sense, that much more can be learned of the physical characteristics of a ductile material by observation on its behaviour during a tensile test than during a compressive or a torsional one; hence it is probable that a hundred tensile tests are made for one of each of the others. The relations between the tensile and the compressive and the shearing strengths of ductile materials are so well known that the latter can generally be inferred from the former in the case of any given specification.

When it is said that a bar breaks with a load of 30 tons per square inch, that means that the bar was originally of an area of cross section equal to one square inch, and that the maximum load was 30 tons. If the specimen is a bar of cast steel, in which, practically, little elongation would occur, the statement would be entirely correct; but this never happens in rolled metals tested under natural conditions, because they elongate before fracture with reduction of section. The result is that the load is reduced as the section diminishes, so that neither the final load nor the section is of initial dimensions.





Section of "Dripless Lights," Showing the Gutter which Catches the Condensation from each Lens.

It would, however, be impracticable to calculate in any other way than the established one, and therefore it is invariably adopted.

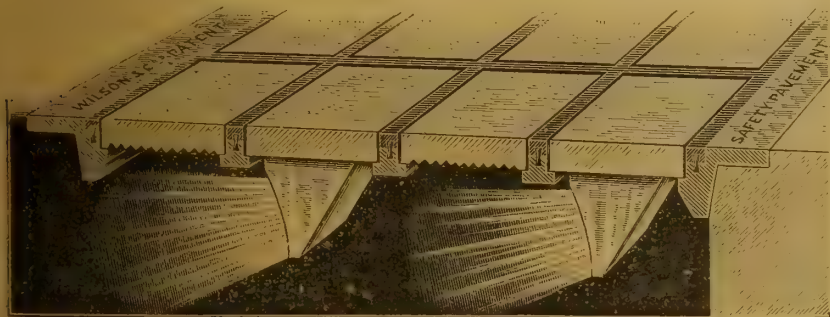
Some slight difference exists in the requirements of the various inspecting bodies in reference to the strengths of steel and iron, but they are not important differences; they all agree in demanding steel of low tensile strength and high ductility. The high, practical value of ductility is the reason for the stretching tests made. Better sacrifice some absolute strength, if need be, to ductility, for the latter is the stand-by under live loads. These inspecting bodies all permit a range of about four tons in tensile strength, with a minimum ductility; in this respect steel compares favourably with iron. The Admiralty test for steel ship plates, which corresponds with the requirements of structural work generally, is that strips, cut either lengthwise or crosswise, are to have an ultimate tensile strength of not less than

would not reveal the hidden fault. In steel, which is homogeneous, a test piece may almost invariably be relied on to indicate the true character of the plate or bar from which it is taken.

#### "DRIPLESS" AND "SAFETY" PAVEMENT LIGHTS.

**M**ESSRS. WILSON AND CO., of 24, Harri-son-street, Gray's Inn-road, London, W.C., are making this combination of lens and frame to supply a horizontal light which prevents the moisture, formed by condensation, falling on anything which happens to be below.

This condensation has been a source of complaint and drawback to the use of overhead lights, and has often prevented the satisfactory lighting of offices, public buildings, &c., but it is



"Safety" Pavement Lights—To Prevent Slipping.

26 tons, and no more than 30 tons per square inch of section, with an elongation of 20 per cent. in a length of 8in. Lloyd's fix the limit between 28 and 32 tons, with the same extension in samples above  $\frac{3}{16}$ in. thickness. The specification for mild steel for bridge work which Mr. Thomson, the American engineer, insists on is as follows:—To have an elastic limit of 38,000lb. (17 tons) per square inch, with a tensile strength ranging between 58,000lb. (25.9 tons) and 65,000lb. (29 tons) per square inch; the elongation to be 26 per cent. in 8in. plates under 36in. wide and 24 per cent. for wider plates.

No such tests as these would be possible with iron; a strength of 21 tons with the grain and 19 across, with an elongation of 16 and 10 per cent. respectively, would be very good indeed for iron. Some merchant shipping experiments gave, as means of various tests: On ship plates 22 tons ultimate stress lengthway, with an extension of 7.7 per cent. in 10in.; on iron boiler plates 21.15 tons lengthway, with 9.6 per cent. extension in 19in. and 18.48 tons crossway, with 3.2 per cent. extension. It is curious that the cast ingot iron should be much more ductile than the puddled iron, the chief characteristic of which is its pasty condition during manufacture; and what renders iron of still less value is the uncertainty of its behaviour, due to the absence of the homogeneity which results from its method of manufacture. Tests of a good steel may be safely relied on to indicate the character of any given plate. Not so those of iron. A test piece taken from an iron plate may be cut from the soundest portion, or it may happen to be taken from a scaly, laminated part. In the first case the value obtained would be too high, because it

effectually overcome by the use of the "Dripless Lights." Messrs. Wilson and Co. have recently supplied them to the North British and Mercantile Insurance Company's office in Threadneedle-street, City, where they may be seen by permission of the architects, on application to the makers.

The safety pavement lights are so constructed as to prevent slipping, and also to meet the objection that is so often made to the projecting studs on the surface of the lights, especially in front of shops and at entrances. The upper portions of the frames being made entirely of lead, they constitute a firm and even hold for the foot, as well as forming a much more sightly pavement light, as the lead is finished quite flush with the glass. Wilson and Co. also make these pavement lights with the lead bars partly intersected with ornamental tiles or mosaic work.

Monuments have been placed in Middle Clayton Church to the memory of the late Sir Harry Verney and his second wife. The first is a bronze portrait in bas-relief, showing, almost in profile, the striking features of the well-known member of Parliament. The second is a cross of black Derbyshire marble of antique form, inlaid with natural passion-flowers, mounted on a bracket bearing an engraved brass.

Mr. J. Passmore Edwards has offered to provide, at a cost of £5,000, a public library building for the parish of St. George's-in-the-East, so soon as the Commissioners for Public Libraries have purchased the freehold for a site. The commissioners have accepted this offer, and are endeavouring to raise by public subscription the sum required (about £3,500) for the purchase of the site, towards which £1,500 has already been received or promised.

#### OBITUARY.

JUST before the Old Year closed Mr. EDWARD HOWARD DAWSON, A.R.I.B.A., F.S.I., of 41, Market-street, Lancaster, died in his thirty-third year. He was the eldest son of Mr. Edward Bousfield Dawson, LL.B., of Aldcliffe Hall, Lancaster, treasurer of the Congregational Union of Lancashire, vice-chairman of the quarter sessions, and a prominent personage in religious missionary, and philanthropic works. He was architect for several important institutions, including the supplementary buildings at the Lancaster County Asylum and the Carnforth and Grange Congregational Churches. He had prepared plans for the Storey Home, in connection with the Royal Albert Asylum at Lancaster. He was at one time a prominent footballer and captain of the Lancaster Rugby team. He married in 1893 a niece of Sir Thomas Storey, and went to reside at Warton Hall. He was elected chairman of the Parish Council, and a guardian of the poor, and has taken part in other public work of a social and religious character, notably amongst missions to poor children. He joined the Institute of British Architects by examination in 1888, and three years later became a Fellow of the Surveyors' Institution.

THE death is announced of Mr. ALEXANDER MILNE DUNLOP, of 8, Old Palace-yard, S.W., head of the firm of Messrs. Dunlop, Lightfoot, and Wallis, of Manchester and London, and agent for the Manchester Ship Canal Company in the purchase of lands and settlement of compensation cases arising out of the construction of the canal. He was largely engaged in arbitration cases for or against most of the great railway companies, and in many other extensive undertakings, and was agent for many large estates. Mr. Dunlop was the senior vice-president of the Surveyors' Institution, which body he joined in Jan., 1871, less than three years after its formation, a surveyor to the Board of Trade, and to the Charity Commissioners. For 21 years he was managing director of the Oakeley Slate Quarries at Blaenau-Ffestiniog, and on the recent severance of his connection there by reason of illness, he was presented by the 1,600 workmen employed at the quarries with a testimonial and address, in which the workmen enlarged upon the good feeling and kindly relations existing between themselves and Mr. Dunlop. He was also for many years the chairman of the Festiniog Local Board. In 1880 Mr. Dunlop stood as the Conservative candidate for Merionethshire, but was defeated by Mr. Samuel Holland.

THE death of Professor ERNST GLADBACH, of Zurich, occurred on December 26, in his eighty-fourth year. He was born at Darmstadt, and was Hessian State architect from 1840 to 1857, when he was called to the Chair of Architecture in Zurich, which he held until his retirement in 1890. He is known for his writings on the history and construction of buildings in wood, especially by his "Holzarchitektur der Schweiz," which has passed through two editions.

#### CHIPS.

The urban district council of Leek have raised the salary of their surveyor, Mr. Myatt, from £175 to £200 a year.

At Southampton, the commemoration of the Queen's 60 years' reign will take the form of an addition to the Royal South Hants Infirmary at a cost of £19,000. A wing was added to the same building as a memento of the Queen's Jubilee.

St. George's Church, Wolverhampton, the largest in the town, has been undergoing restoration at a cost of £2,500, and the Bishop of Lichfield has fixed the rededication service for Sunday, the 24th inst. Mr. T. Skett has the contract, and the architect is Mr. Beck.

Mr. H. W. Smith, assistant borough surveyor of Bournemouth, has been appointed borough surveyor of Scarborough. The salary is £300 a year, increasing to £400 by annual increments of £25.

Mr. W. A. Ducat, Local Government Board inspector, attended at the offices of the urban district council, Talbot-road, Stretford, near Manchester, on Friday, for the purpose of holding an inquiry into an application made by the Stretford District Council for power to borrow £3,250 for new sewage works.

The fine parish church of St. Stephen's-by-Saltash, which was recently restored from plans by Mr. St. Aubyn, is about to have the bells recast by Messrs. Taylor and Son, of Loughborough, and rehung by Mr. Aggatt, of Chagford, Devon.



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## ILLUSTRATIONS.

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NEW THEATRE, ARCADE, AND CIRCUS AT BLACKPOOL.—  
TECHNICAL SCHOOL, BRADFORD-ON-AVON.—HOUSE AT  
BUXTON.

## Our Illustrations.

"OLD MASTERS" ON THE CONTINENT, NO. XLIII.:  
"HENRY DE LA TOUR, VISCOUNT OF TURIN."

PHILIPPE DE CHAMPAIGNE was the best portrait painter in Paris during the first half and middle of the 17th century, and he decorated the Luxembourg Palace for Queen Marie de Médicis. This work was commenced by his master, Nicholas Duchesne, whose daughter became Champaigne's wife. He was rector and professor of the French Academy of Painting, founded by Louis XIV. in 1648. He was born at Brussels in 1602, and died in 1674 at Paris. Most of Champaigne's famous works are in the Louvre, and the full-length portrait of Cardinal de Richelieu is one of the conspicuous examples there of his ability. There is a group of three portraits of his Cardinal patron in our National Gallery, Trafalgar-square. His portrait of his own daughter, a nun of Port-Royal, is generally reckoned the most celebrated of his works in the Louvre. The example given to-day is at Munich.

NEW THEATRE, CIRCUS, AND MARKET AT BLACKPOOL.

In our issue of Oct. 2 last, we mentioned that the directors of the Lane Ends Estate Co., Ltd., Blackpool, having obtained competitive schemes from Mr. C. J. Phipps, Mr. F. Matcham, and Messrs. Wylson and Long for the reconstruction of their buildings on the Promenade, had unanimously selected Messrs. Wylson and Long's designs. We now reproduce the selected drawings. The Lane Ends Estate comprises one of the oldest entertainment buildings in Blackpool, and in remodelling it, the site of the present baths will be occupied by a permanent circus building capable of seating 2,000 persons. The circus ring is placed within an elliptical inclosure in which "water shows" can take place, the floor of the circus ring being made to rise and fall by means of hydraulic rams. There are entrances and staircases from the sea front, and also from Bank Hey-street in the rear. Ample stables and standing accommodation for the horses and animals used in the entertainments are provided on the ground floor and in the basement, the latter being reached by a sloping roadway from Bank Hey-street, dressing-rooms are provided for the artistes engaged in the circus entertainment. The circus is a lofty building, being 60ft. from floor to ceiling, above which rises an elliptical coved dome and lantern light. In the basement below the circus are provided engineers' workshop, boiler-house, engine-house and electrical department. Adjoining the circus and on the ground floor level is the arcade or fancy bazaar, with entrances from the front and from Bank Hey-street. The arcade is lighted with an iron and glass roof supported on elliptical ribs resting on stone trusses. Below the bazaar is placed a large restaurant with entrances from the Promenade, Bank Hey-street, and Victoria-street, together with the requisite kitchen accommodation. The remainder of the ground floor of the site is occupied by shops facing Victoria-street, with cellars

under. Above the shops, and extending partly over the arcade, is provided a large theatre of varieties capable of seating over 2,000 people, arranged with its principal entrances to the sea front, and divided into the customary tiers inside, all of which, pit, circle, and gallery, are provided with handsome lounges. Separate entrances to every part of the house are also provided from Bank Hey-street, these additional entrances in every case being necessary in consequence of the difficulty sometimes experienced in walking along the sea front in boisterous weather. The front elevation is arranged with balconies overlooking the sea, and these are in communication with the lounges of the several tiers of the theatre.

## TECHNICAL SCHOOL, BRADFORD-ON-AVON.

THIS school, which is now completed, has been erected for the purpose of technical education in a small country town of about 5,000 inhabitants. It contains, on the ground-floor, a spacious entrance-hall, rooms for cookery and laundry work, and physics lecture-room and laboratory, together with cloak-rooms and lavatory accommodation; on the first floor are provided the chemical laboratory, balance-room, lecture theatre, and a large art class-room. The building has been designed in strict accordance with modern requirements, and at the same time an effort has been made to erect a building in harmony with the charming old stone buildings of the district. The walling is of local stone range-work, with Winsley stone dressings; the roofs are covered with green slating, and the whole of the windows glazed with clear glass in lead lights. The total cost of the building is about £3,000, and of this amount it is satisfactory to note that only £500 will be provided from the rates, the remainder being obtained from very liberal private subscriptions and technical instruction grants. The work has been carried out by Mr. E. Chancellor, of Bath, from the designs of the architects, Messrs. T. B. Silcock and S. S. Reay, of Bath.

## HOUSE, BUXTON.

This house is now approaching completion, and is being erected for Mr. F. Baden Bengier. There are no cellars to the house, and the whole ground within the walls is covered with concrete. The joiners' and carpenters' work is being executed by Messrs. Wilson and Toft, builders, Manchester. The stone and brickwork is being done by Mr. Gladwin, Buxton. Mr. Charles Heathcote, of Manchester, is the architect.

During the past two years the building trades have been rather slack in Dundee, and the falling-off was especially noteworthy both in 1895 and 1896 in the demand for new tenement houses. The growth of the assessable rental of the city during the past five years has been as follows:—1892-93, £726,656; 1893-94, £744,651; 1894-95, £746,418; 1895-96, £765,445; and 1896-97, £775,805.

The Rhyl Urban District Council have completed the negotiations for purchasing the site of the old Royal Alexandra Hospital at the end of the East Promenade. The sum of £3,500 has been paid for the site, and the Hospital Committee have agreed to pull down and remove the building within four months. It is proposed to lay out the site when cleared as a recreation ground. The council have also agreed to extend the West Promenade towards the Fordy, with a sea wall in front, the object being to open up a large tract of building land and to secure a better approach to the Marine Lake. Tenders for the work have been received, that of Mr. Jacob Biggs, contractor, Birmingham, being the lowest.

Sir Henry Dryden has offered to present to Peterborough as the nucleus of a public museum, his magnificent collection of historic documents and curios relating to the surrounding district. The collection is the work of a lifetime, and it would be very difficult to give an idea of its value. The offer is made subject to a suitable home being provided, and if Peterborough declines to accept it, the collection will probably be given to Cambridge.

The Galashiels Co-operative Society, having purchased the property immediately to the eastward of their present premises in High and Roxburgh-streets, have resolved upon making a considerable extension. The extended buildings will be 120ft. in frontage with a depth of 92ft. The extension includes a new butcher's shop, an enlargement of the present grocery department with back shops and cellars, and a fish shop. A suite of offices and a directors' room is placed on the first floor, with show-room on the two floors over. The architects are Messrs. J. and J. Hall, Galashiels.

## COMPETITIONS.

GATESHEAD.—At a meeting of the Gateshead Board of Guardians held on Tuesday, the Cottage Homes Committee reported that, after consideration of the competitive designs, they recommended the adoption of the plans marked "No. 4." The committee also recommended that they be authorised to act in this matter to the extent of getting the plans approved by the Local Government Board, and tenders submitted for the execution of the work. The selection of the tenders would be reserved for the Board. The report having been unanimously adopted, the chairman opened the sealed envelope inclosing the successful architect's name and address, which, he said, was Mr. Cecil A. Sharpe, A.R.I.B.A., architect and surveyor, 59, Fenchurch-street, London, E.C. The architect's estimate of the cost of the new buildings was £11,307.

POPLAR.—The designs of Messrs. Lansdell and Harrison, of Highbury, have been placed first by the assessor for the public coroner's court and mortuaries, for the Poplar District Board of Works.

## CHIPS.

The building trade in York has been very active during the year. Plans for about 540 villas, houses, and cottages received the approval of the council. Plans have also been approved for the construction of 24 new streets and back roads in Haxby-road and Fulford-road districts, showing sites for 300 or 400 houses; also for six new hotels or public-houses. Several large structural alterations to business premises, necessitating plans, have been approved, and there have been many instances of the conversion of houses into shops.

Foremost in the buildings finished in Truro during the past year, says the *Cornwall Gazette* in a review of 1896, comes the Passmore Edwards Free Library, built by Messrs. Clemens and Battershill from plans prepared by Mr. Silvanus Trevail, F.R.I.B.A., at the instance of Mr. J. Passmore Edwards, of London, the generous donor of the new building. It is admittedly the best Free Library in the county.

The late Mr. Alderman G. Clay, of Manchester, has left to Mr. Jones, the manager of his business as a builder and arbitrator, £500. The residue of the estate (which is understood to be considerable) the deceased directs shall be bestowed in charity, including £4,000 to be expended in the erection of drinking-fountains in Manchester, and £2,000 towards the provision of schools at Gorton in connection with the Brookfield Unitarian Church.

The Middlesex County Council have at length adopted the report and estimates of Mr. J. Wolfe Barry, C.B., for the reconstruction of Kew Bridge on its present site.

The timber trade in the Hartlepoons has been exceptionally brisk. The import in 1896 was the largest on record, amounting for the 11 months to end of November to 383,591 loads, as against 348,226 loads in the same period of 1895. The consumptive demand was large, alike for ship and house-building woods and mining timbers, and stocks of all classes are small, in spite of the large import. Prices have advanced by about 25 per cent. all round, and contracts for next year have been closed at satisfactory figures.

In Gateshead the Brighton Avenue schools, giving accommodation for about 1,300 children, have been completed and handed over to the board, the Low Fell schools, accommodating about 900, are rapidly approaching completion. The former schools were carried out by Mr. Alex. Pringle, of Gateshead, and the latter by Mr. Joseph Elliot, North Shields.

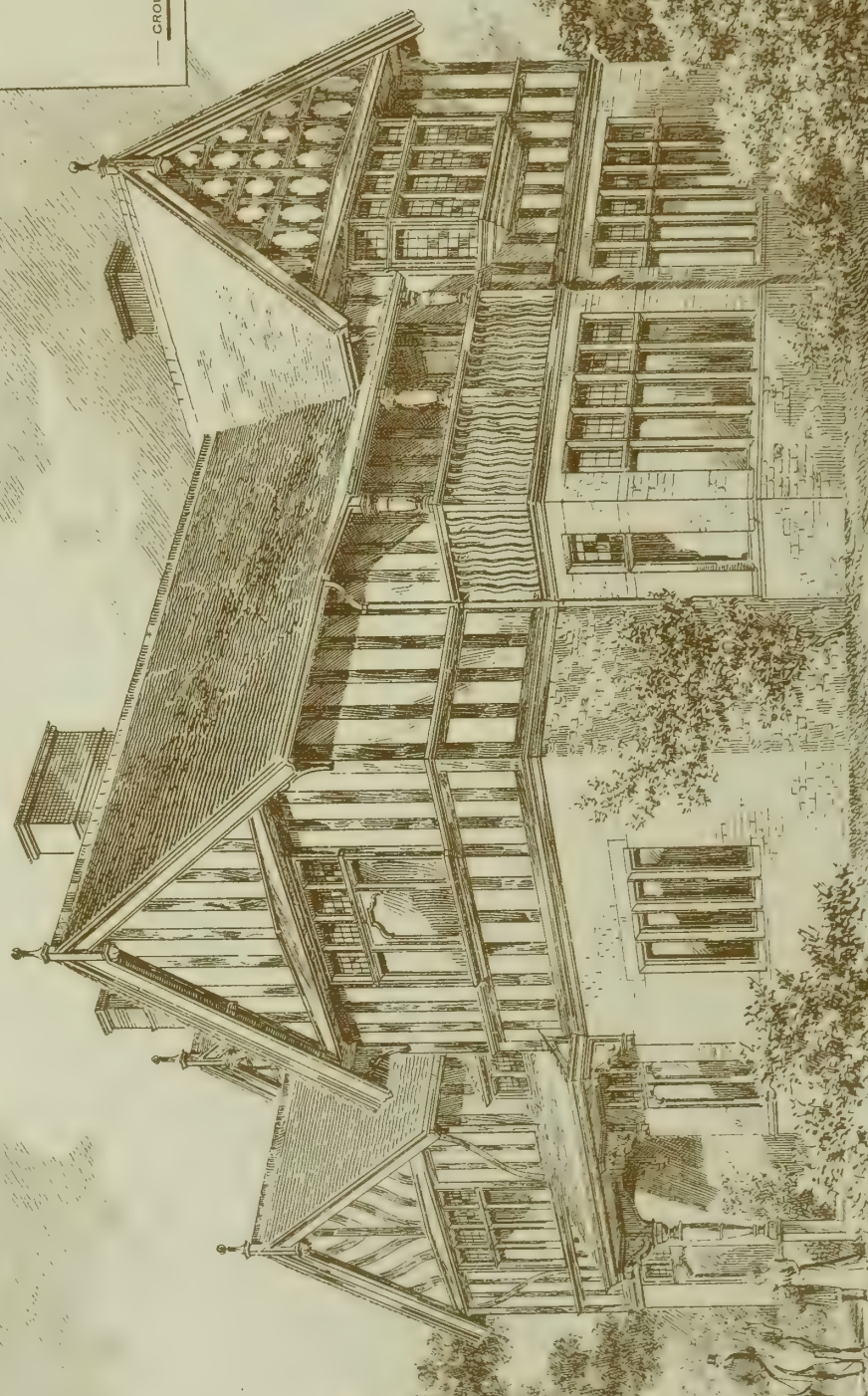
To the iron church of Bernard's Heath, St. Alban's, a permanent chancel, the first section of the church to be eventually built on the site, has just been added. Messrs. E. Dunham and Co. were the builders, and the altar, of alabaster and green marble, containing figures in relief of our Lord in Majesty supported by SS. Alban, Stephen, John the Baptist, and Theodore, was executed by Messrs. Brindley and Farmer, of Westminster Bridge-road, S.E. The dedication took place last week.

The Bill to incorporate the Harrow, Uxbridge, and High Wycombe Railway Company seeks power to construct nearly 25 miles of new railways in connection with the authorised Ealing and South Harrow Railway, which is being actively fostered by the Metropolitan District Railway Company. The new lines proposed will continue the Ealing Railway from Harrow to Beaconsfield and Chipping Wycombe, and by means of branch lines this railway will be connected with the Great Western Railway at Acton, and with the Midland and South-Western Junction Railway at Willesden.









GROUND-FLOOR PLAN

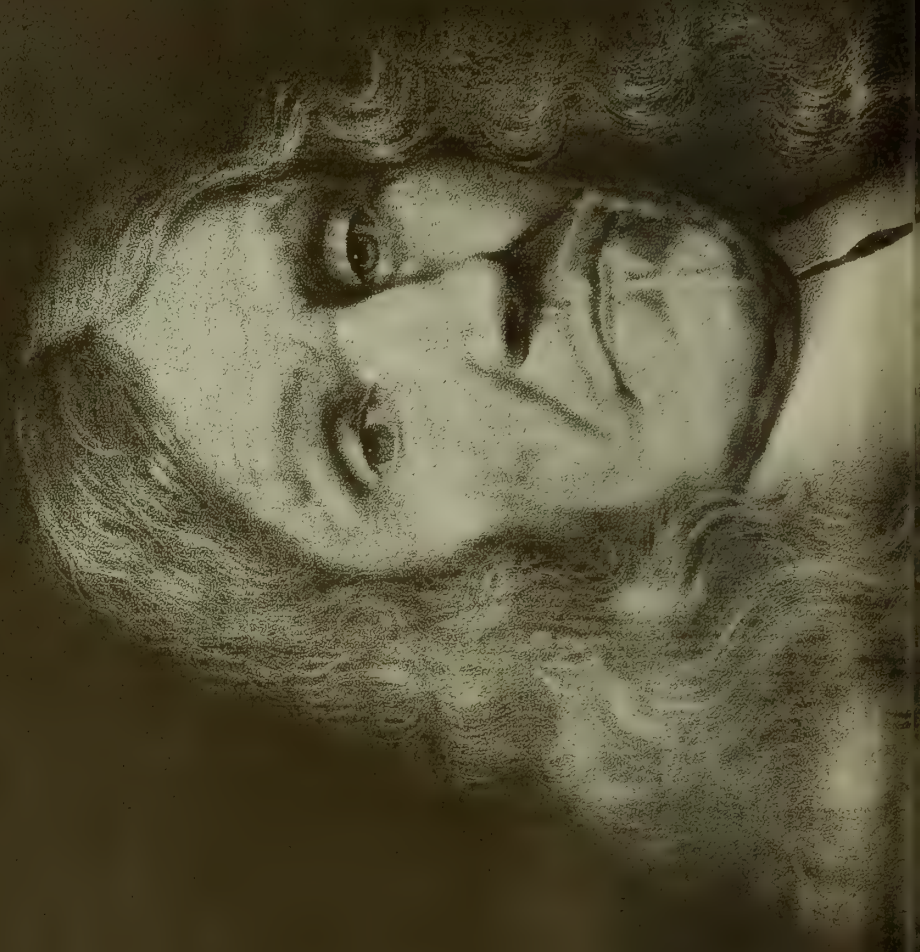
HOUSE AT BUXTON  
FOR B. BENDER ESQ.  
Chas. Heathcote  
Architect  
Manchester







THE BUILDING NEWS, JAN. 8, 1897.







FROM A PHOTO BY FRANZ HANFSTAENGL.

"PHOTO TINT" by James A. H. W. W.

# OLD MASTERS · ON THE · CONTINENT · N° 43 ·

GENERAL FIELD-MARSHAL HENRY DE LA TOUR · VISCOUNT OF TURIN · (MUNICH) BY PH. DE CHAMPAIGNE · (B 1602 · D. 1674) FRENCH SCHOOL

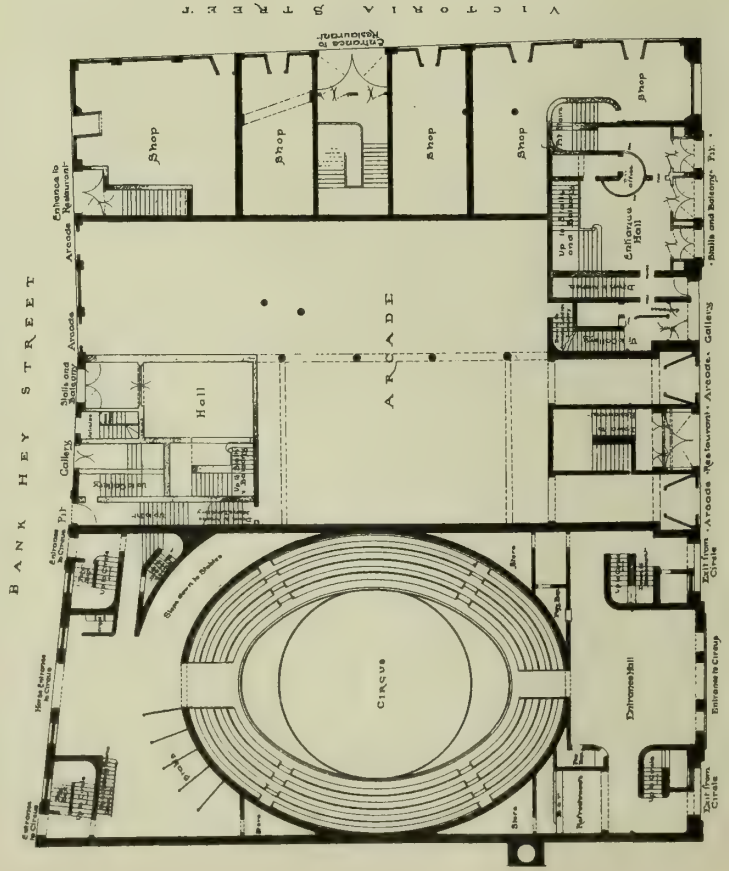




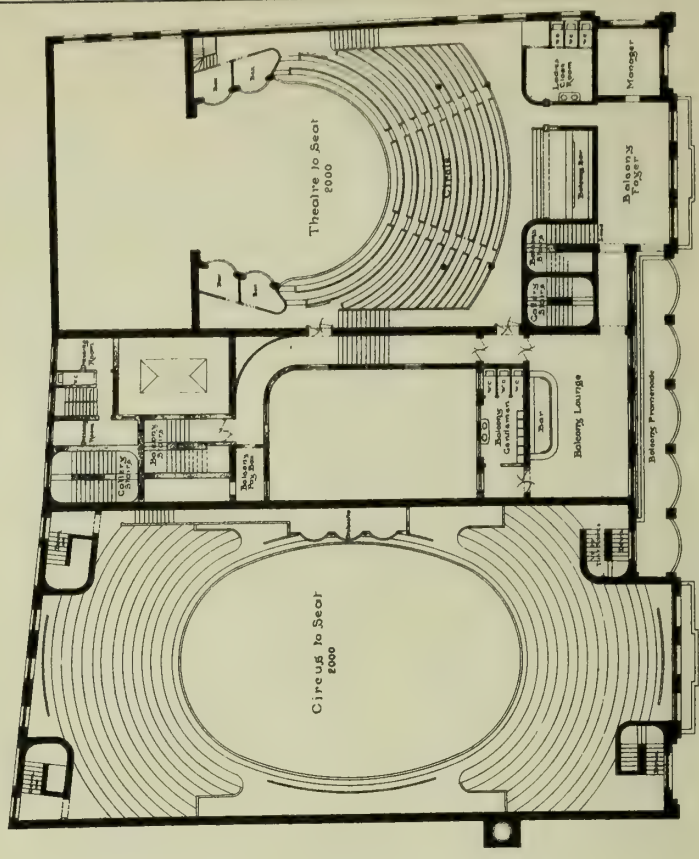




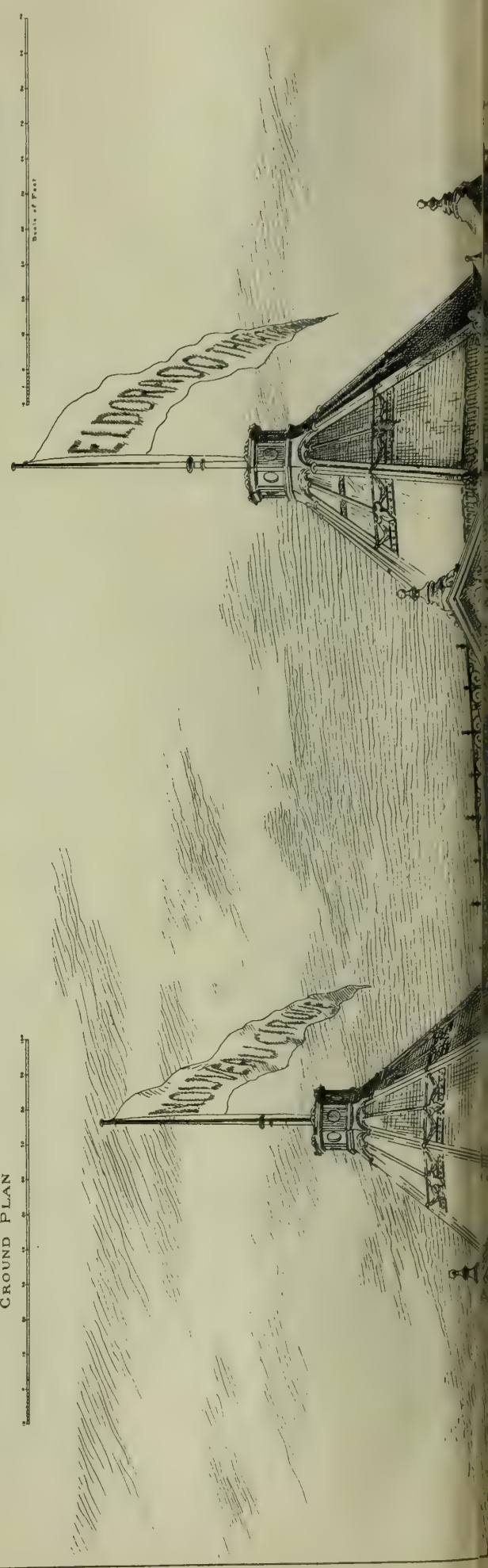




GROUND PLAN



PLAN AT BALCONY LEVEL





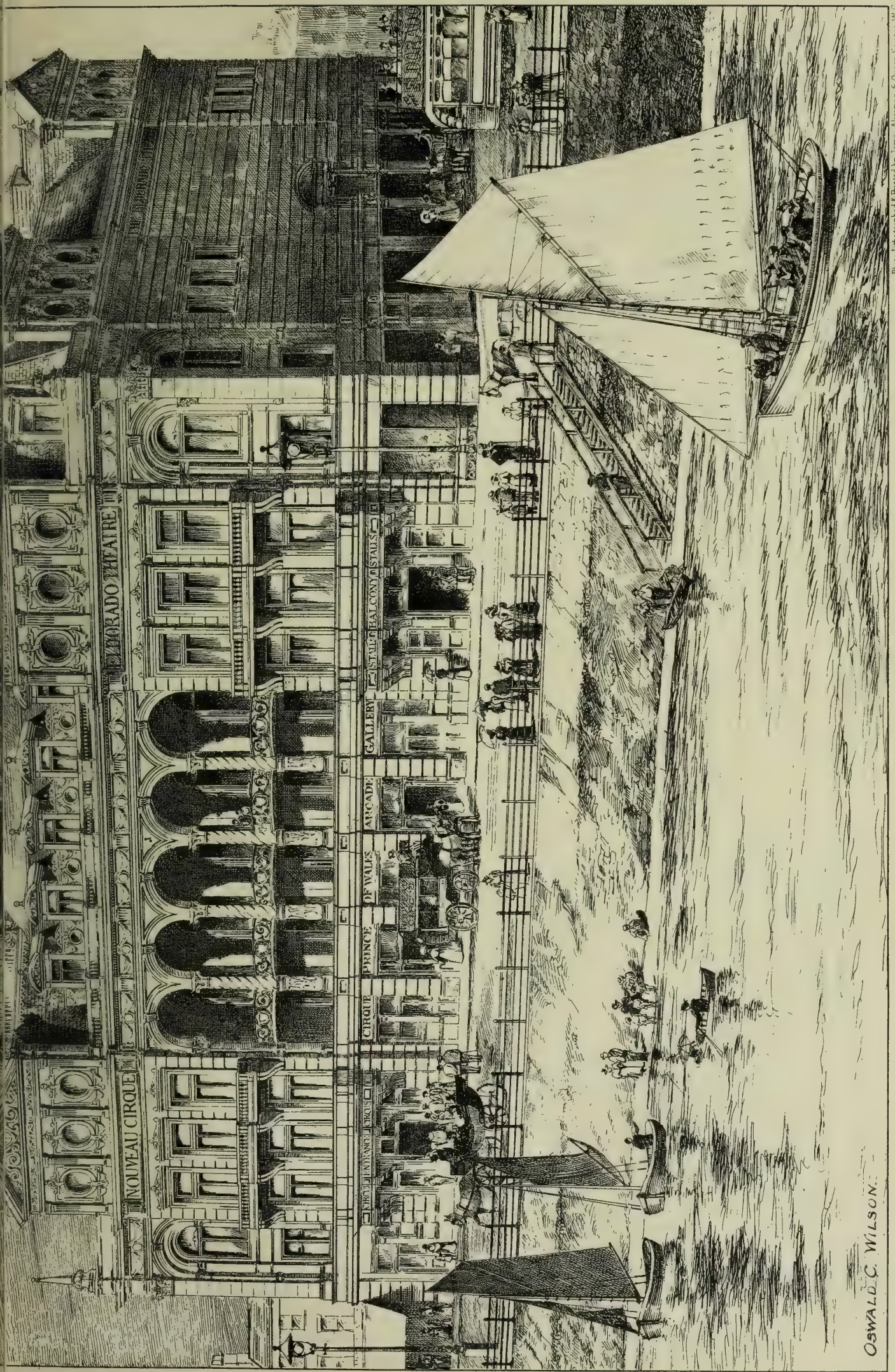


Photo Lithographed & Printed by James Alderman 6 Queen's Square W.

NEW THEATRE - CIRQUE & MARKET AT BLACKPOOL - MESSRS WYLLSON & LONG ARCH<sup>TS</sup>

OSWALD C. WILSON.

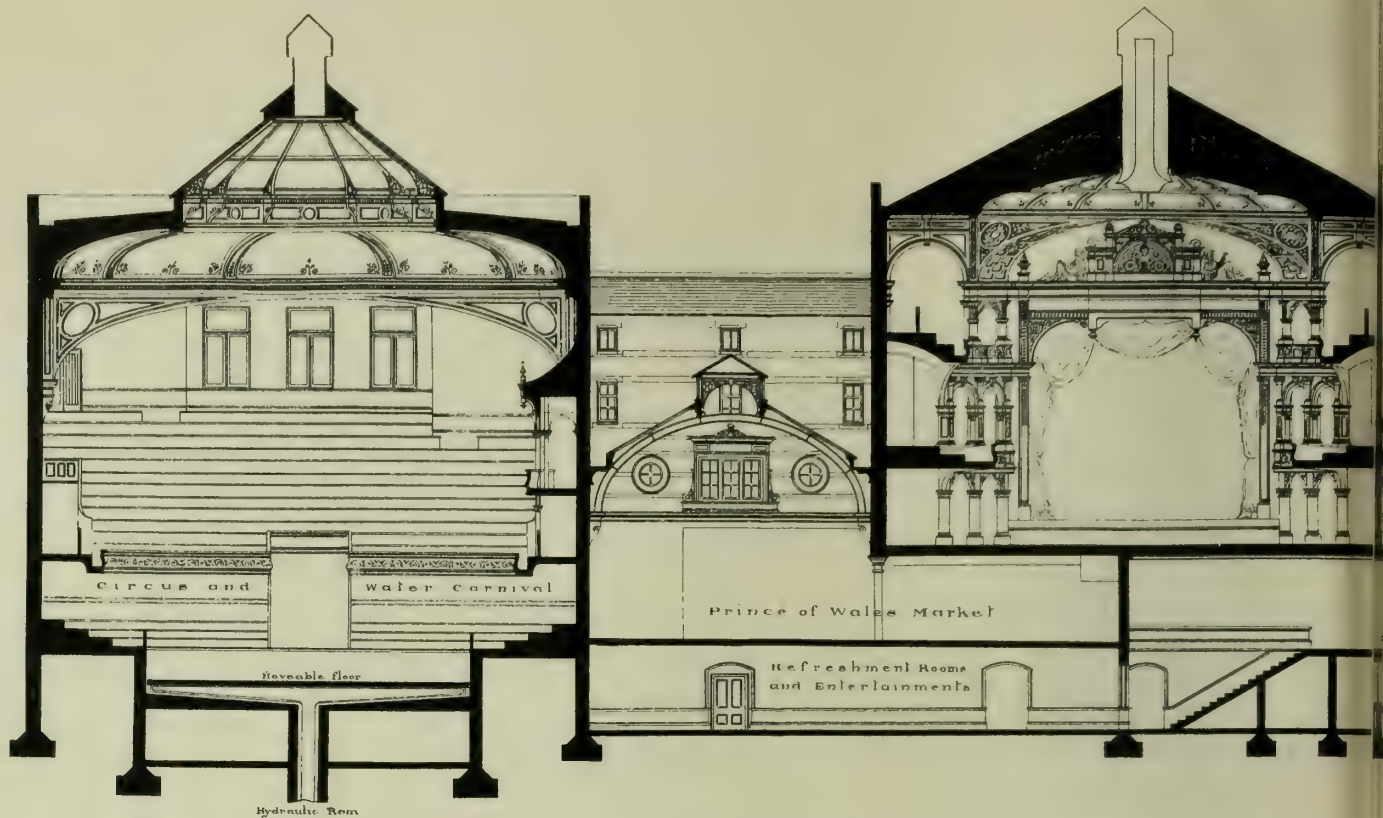








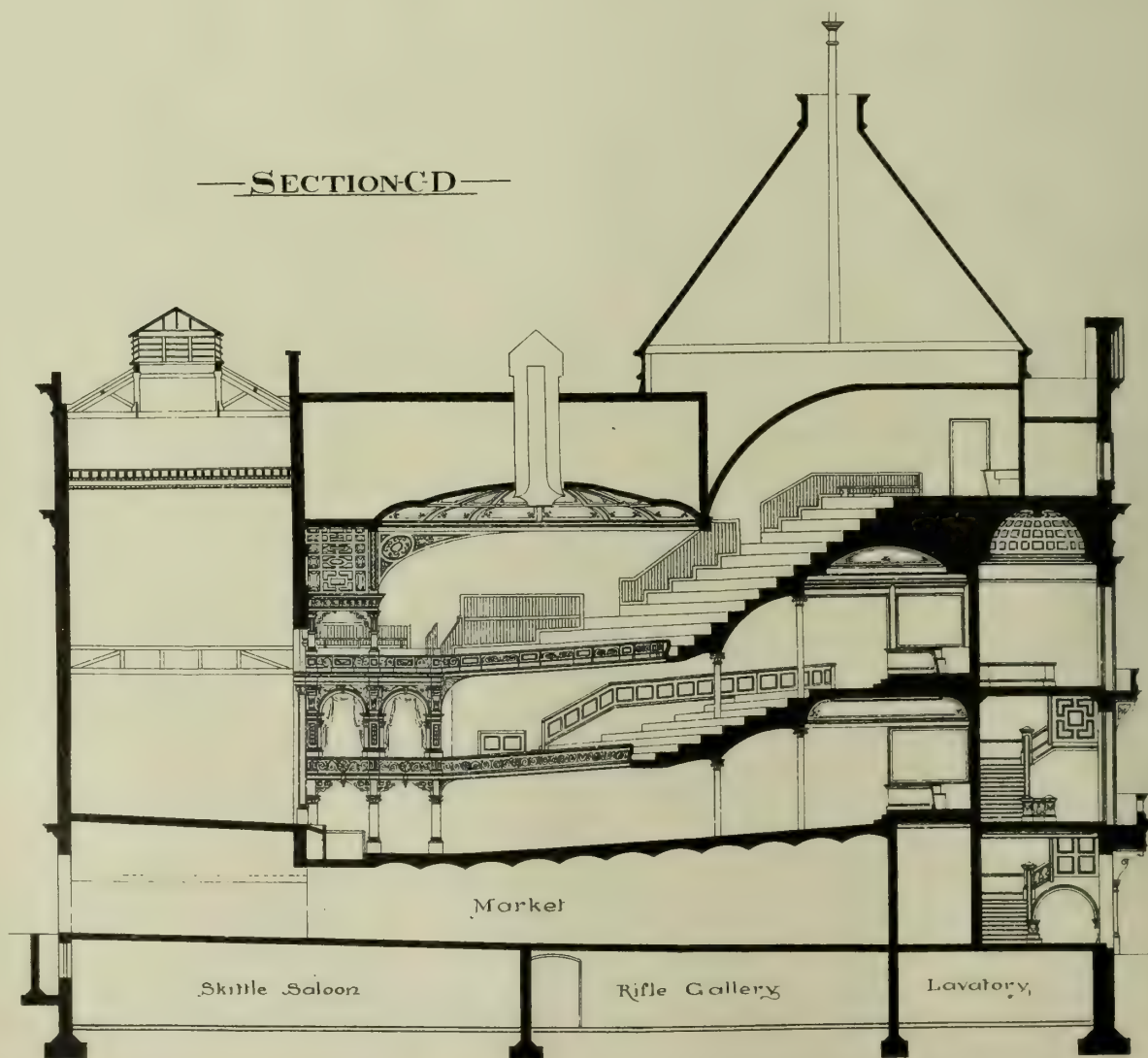




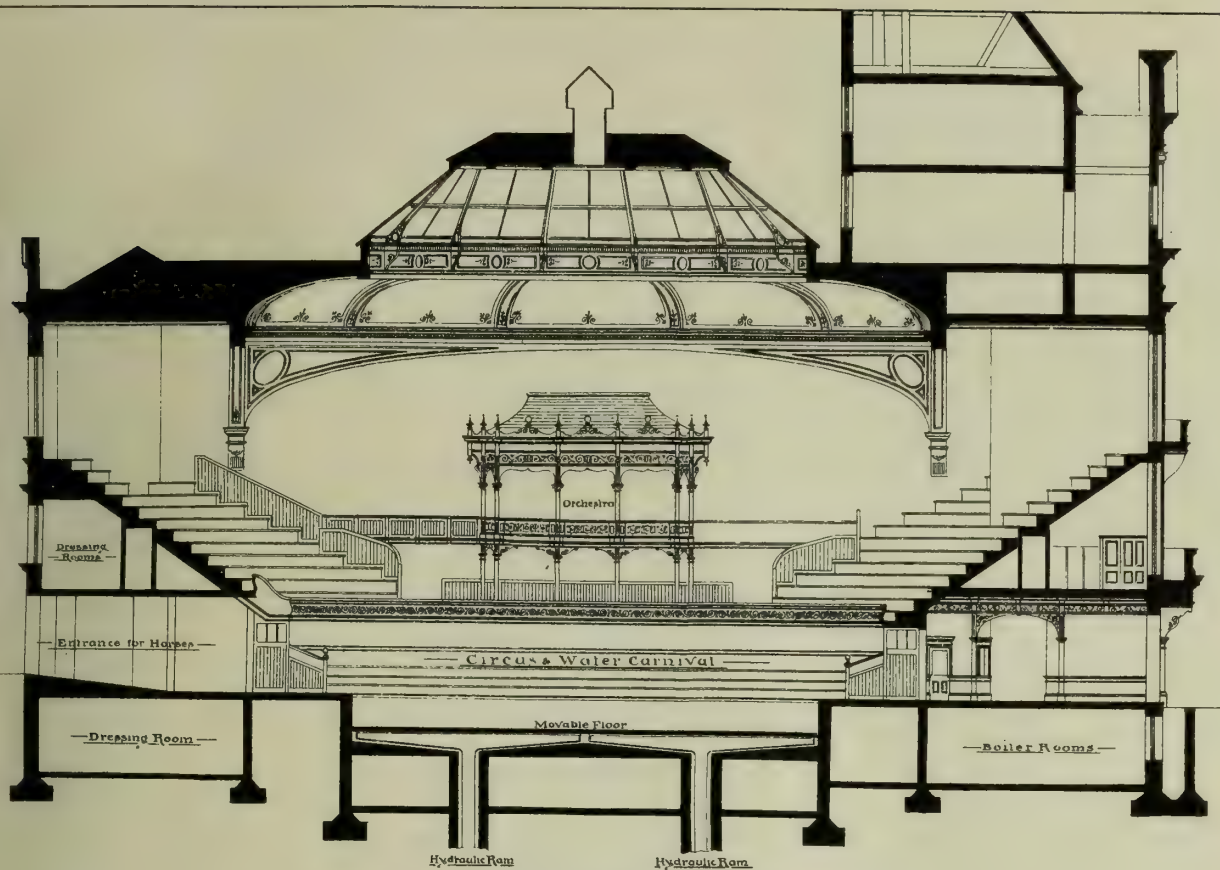
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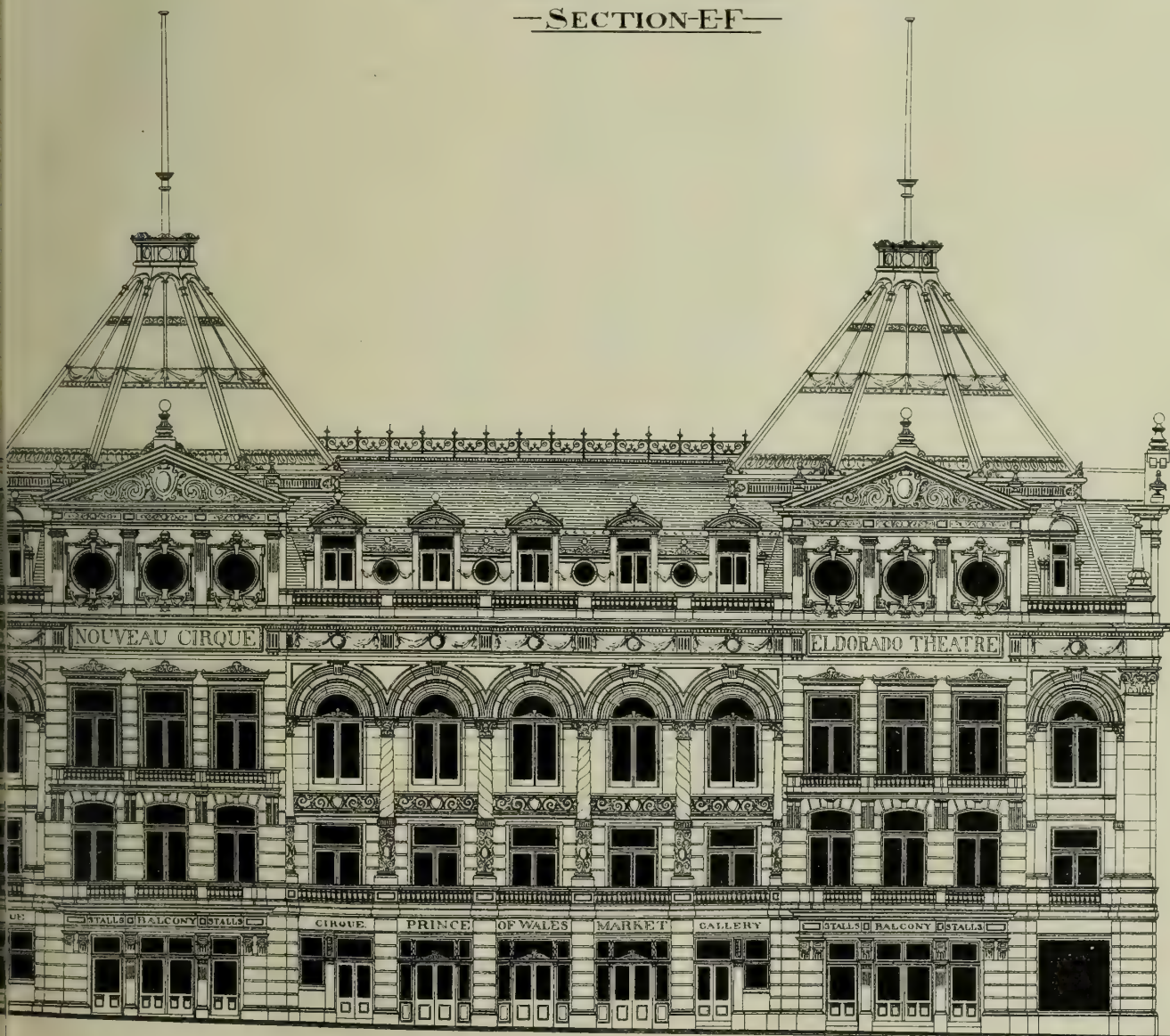
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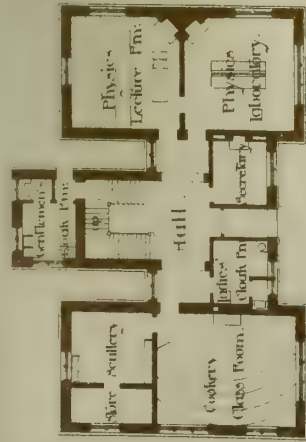


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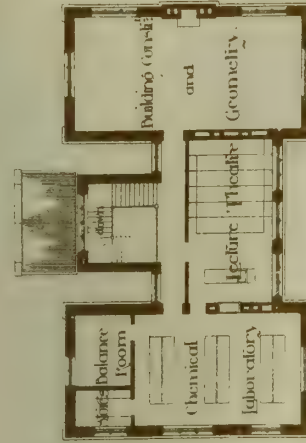




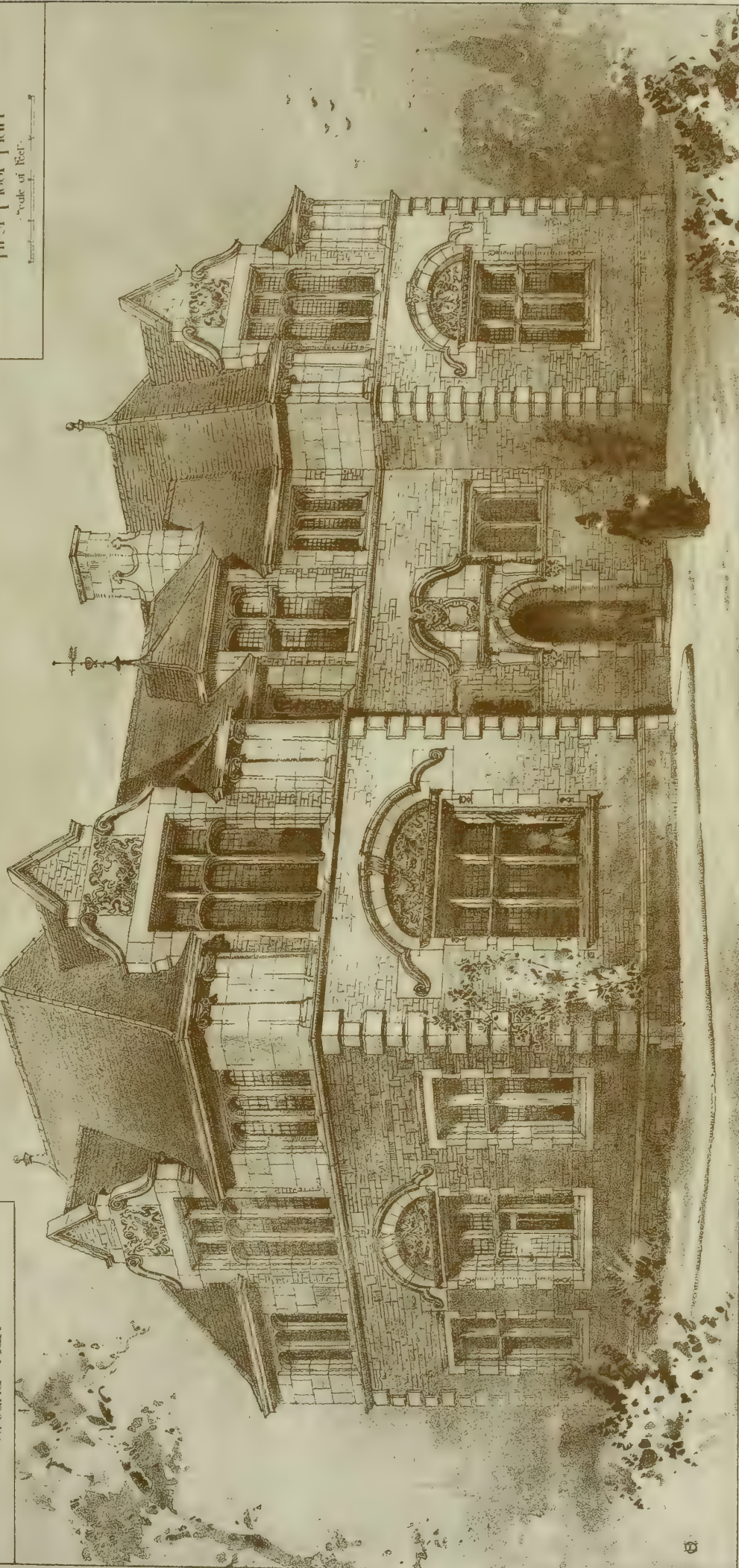




Ground Plan.



First Floor Plan.



TECHNICAL SCHOOL · BRADFORD-ON-AVON · MESSRS SILCOCK & REAY ARCHT







## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

**ARCHITECTURAL ASSOCIATION OF IRELAND.**—A meeting of this association was held on Tuesday night at the Grosvenor Hotel, Dublin. Mr. R. Caulfield Orpen, president, occupied the chair, and about 40 members were present. Mr. Thomas Drew, R.H.A., President R.I.A.I., delivered a lecture on "The Architecture of Dublin." Mr. Drew said that in the study of architecture they had remarkable advantages in the City of Dublin. They lived in an old historic city, which contained many respectable monuments. There was a picturesqueness of architectural effect, the study of which could not fail to be of the greatest interest. For his part he preferred Dublin before all the towns and cities of the United Kingdom for the enjoyment of the student of architecture, if he only opened his eyes. It had good and ancient architecture, and afforded groupings which might make the fortune of the architectural artist. In streets like Dame-street and College-green they had bold and various specimens of what he might call the Dublin architectural vernacular. The architects who designed some of them were mostly still living, and he was accordingly debarred from criticism. There was, however, in that neighbourhood a great deal to be learned, and a good deal of refinement of design to be seen. The student, after the current architecture of the day, could fall back on the main architectural wealth of Dublin, among which would be found numerous specimens of the Classic work of the 18th century. There was scarcely an example in Dublin which was uninteresting; there was an extraordinary variety of genius evinced, and boldness of design. In the matter of food for architectural study Dublin had a great pull over the ordinary British towns of commerce in its picturesqueness and pictorial capabilities, and in what he might term its unsophisticated grouping. In the two cathedrals the water-colour artist would find a score of subjects. In the Upper Castle Yard there was not much architecture, but work would be found there quaint and Dutch-like. Interesting groupings would also be found about the City Hall and Trinity College. Mr. Drew then spoke at some length of the architectural features of the old Parliament House, and in connection with its design mentioned the names of Richard Cassell, Captain Edward Lovett Pearce, and Robert Parkes. Among several architects who gained fame in connection with old city buildings, the lecturer spoke of Thomas Cooley, who designed the Four Courts; and Gandon, whose great work was the Custom House. The latter building was something out of the common, and had much simple dignity. Church architecture in Ireland was, he thought, now at a low ebb. They had in former years much cleverer work, and the tendency was to go on repeating these clever features until they got a family likeness over the country, from which it was time to break away. It would be a good thing for the members of that association to turn their backs on what was merely turned out day by day in the nearest churches and begin to diligently study in the books at their disposal what the Mediæval architecture of England had been. The first half of the present century was perhaps the worst epoch, from the point of view of architecture, seen in Ireland in the course of six or eight centuries. He hoped, however, there was going to be a great revival, and he hoped that association would be the means of bringing it about. Mr. A. E. Murray, R.H.A., proposed, and Mr. W. M. Mitchell, R.H.A., seconded, a vote of thanks to the lecturer. The chairman, Mr. Walter J. Doolin, Mr. Howard Pentland, and Mr. Alfred McLoughlin having spoken, the vote of thanks was passed unanimously. The chairman announced the next meeting on the 19th inst., at which Mr. J. J. O'Callaghan will lecture on "Design." The library of the association is now open, and the classes on Building Construction commence this week, and those on Design next week.

The enlarged workhouse infirmary for Marylebone in Rookham-street, Ladbroke-grove, has just been opened. The building now consists of eight blocks connected by five bridges, and covers seven acres of land. Mr. H. Saxon Snell was the architect.

The pulpit from the Carfax Church at Oxford, recently demolished, has been placed in the chapel just added to Windlesham House School, Brighton. Other materials of the Carfax chapel have been utilised in the roof, organ-loft, altar, and reredos of the same chapel.

## Building Intelligence.

**ALSAGER.**—The new Church of St. Mary Magdalene, which is to be opened to-day (Friday), is in the Decorated style, and consists of a nave and chancel 26ft. wide, north and south aisles opening into nave by arcades of five bays each, and organ-chamber on the north side of the chancel, with choir and clergy vestries opening out of same. The tower is 16ft. square, and forms the baptistery, and will ultimately be surmounted by a spire. The total length of the church is 124ft., and the width across the nave and aisles 56ft. The portion now carried out consists of the chancel, organ-chamber, and vestries, the nave, with the south aisle and a portion of the north aisle, the south porch, and the lower portion of the tower to the level of the roof of the nave. The church is seated at present for 450, but will eventually accommodate 700 people. The cost of the present portion will exceed £8,000, an additional sum of £1,500 being required to complete the tower and spire. The present contract has been executed by Mr. John Fielding, of Alton, and Messrs. Austin and Paley, of Lancaster, are the architects.

**KIRKCONNEL, DUMFRIESSHIRE.**—The parish church was reopened on December 17th, after a period of nine months, during which it has undergone extensive repairs and has been considerably enlarged, from plans by Messrs. M'Gibbon and Ross, of Edinburgh. Although most attention has been bestowed on the interior, the addition of a semicircular chancel, the extension of the nave, and a new roof and new windows filled with cathedral-tinted glass, have all tended to alter for the better the outward appearance of the old rough-cast walls. The internal roof and ceiling have been removed, and replaced by an open timber roof stained and varnished and provided with suitable means of ventilation. The old-fashioned, narrow pews have been superseded by seats of modern pattern, and a wooden floor has replaced the bare stone flags which did duty for many generations. The nave has been extended to about double its original length, and at the end is a mullioned window. The chancel has been built out from the southern wall in semicircular form, and it is approached by three broad low steps of polished red sandstone, and paved with terracotta-coloured tiles. The new pulpit is of carved oak. Close by is the baptismal font. Until a few days ago it occupied a place in one of the boundary walls of the glebe, and so far as can be judged from its shape and weather-worn tracery, it appears as though it had originally formed part of the base of a runic cross. The other additions include a large vestry, and the church is heated by apparatus erected by Messrs. Mackenzie and Moncur, Edinburgh. The cost of the repairs and additions has been over £1,200.

## CHIPS.

A home for private patients is being added to Sunnyside Lunatic Asylum, near Arbroath. Mr. Crockatt, of Brechin, is the contractor.

The new Infirmary for the Sisters of Bethany, Bournemouth, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A memorial window, to be designed by Mr. C. E. Kempe, of London, is to be placed in St. John's Church, Coventry, as a memorial of the late rector.

The Wrexham Rural District Council have received a large number of application for the post of sanitary inspector for the southern division, vacant by the retirement of Mr. Edward Davies. Mr. Joseph Arthur Jones, builder and joiner, Broughton, was appointed at a salary of £105.

The corporation of Heywood have accepted the resignation of the offices of borough surveyor and waterworks manager tendered by Mr. James Diggle, C.E., and have appointed him as consulting engineer at a salary of £250 per annum. It was reported that works to the value of £173,000 had been carried out in the borough under Mr. Diggle's supervision during his term of office.

Twenty-eight applications have been made for powers to construct light railways in Great Britain, of which 15 were from England, three from Wales, and ten from Scotland. The proposed railways will have a length of over 300 miles. The specifications will be considered by the Light Railways Commission, and if approved by that body, will go before the Board of Trade for confirmation.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—A. S. and S.—T. C. D.—E. A. and Son.—A. C. and Co.—M. H. L. B.

## "BUILDING NEWS" DESIGNING CLUB.

## FOURTH LIST OF SUBJECTS.

D.—A small Technical Institute for a country town of 5,000 inhabitants, to cost about £3,000, to be built on a level site, having a frontage of 120ft. facing the south; but the buildings are to occupy less than this width. The accommodation is to comprise, on the ground floor, a physics laboratory, 420ft. super.; a physics lecture-room about same size, but rather larger; a cooking-class room, 520ft. super., a scullery adjoining, and a pantry store. There must be a cloakroom and w.c. for each sex, and a secretary's office. Upstairs a large art-class room, a general lecture theatre, and a chemical laboratory with balance-room and store attached. Scale, 8ft. to the inch for elevations and section. Plans may be drawn 16ft. to the inch. View essential. Style, Renaissance. Material, brick and stone. Roof covered with tiles. A good entrance hall is necessary, and a staircase 3ft. 6in. wide without winders. Elevation to set back 20ft. from the frontage line.

## DESIGNS RECEIVED FOR VILLAGE SCHOOL.

"Agon," "Devonia," "P in a Circle," "Oblivisei non Possum," "Hurst Park," "Halsted," "Don," "Whitefriar," "Caakie," "Charley's Aunt," "Two and Two Make Four."

## Correspondence.

## ST. CUTHBERT'S CHURCH, KENSINGTON.

To the Editor of the BUILDING NEWS.

SIR,—My attention has been called to a letter in your issue of the 1st inst. from Mr. H. R. Gough, in reference to the above.

I am perfectly aware, as others are, that Mr. Gough designed this church, and I yield to none in admiration of his work. It is only right to state that I was asked by one of the assistant clergy, with the approbation of the vicar, some 14 or 15 months ago, to suggest a scheme of decoration, and in consequence wrote a paper, illustrated with drawings, which I read before a meeting convened in one of the rooms in the new parish hall, and presided over by the vicar. It



was subsequently suggested that I should send three of these drawings to the Royal Academy for exhibition.

Mr. Gough's insinuation that I am advertising myself as the architect of the church is entirely incorrect, since I am only the architect of the decorative features proposed by me and shown in your reproductions. As to whether these will be carried out I know not; but trust they may, as I take as great an interest in the work at St. Cuthbert's as Mr. Gough. The veiled sarcasm in your correspondent's letter I pass by as unworthy of one in his position.—I am, &c.,

CYRIL E. POWER.

97, Queen Victoria-street, E.C.4, Jan. 4.

#### "NEW CITY HALL," (?) BELFAST.

WE have been much interested in the correspondence herein, and feel—as, no doubt, all competitors do who provided the city hall—very indignant at the treatment we have been subjected to at the hands of the assessors, as surely it was their duty to have adjudicated the designs, and have drawn up their award in accordance with the conditions, and to have used their own discretion as to their true interpretation, and not to have sought further instructions, and toadied to the desires of the committee at the eleventh hour.

The result of the competition has consequently rested among those competitors who disregarded the suggestions made in the conditions, and omitted the city hall.

It appears in the interests of both the rate-payers and architects that a public building of such magnitude and importance should be erected from the very best designs which the talent of the profession can produce, in order that it might eventually become an historic example of the work of this era; and it seems that if the present decision be adopted, this object will possibly not have been obtained.

In reply to our inquiry as to whether the hall would be "absolutely required," we were informed by one of the assessors that it was "desirable" that it should be provided, and naturally we were reassured that our previous opinion of the conditions was fully justified, and prepared our scheme accordingly; but in consequence of this misleading statement, and through the action of the assessors, our design was set aside without any consideration whatever, as were all those which provided the city hall.

We have been legally advised, and taking into consideration the whole circumstances, understand that we are fully entitled to a *quantum meruit* for the trouble and expense of preparing a design, and we therefore beg to suggest a course which would, we feel sure, be more satisfactory both to the Belfast Corporation and the competitors—viz., that a new competition be instituted, in which the whole of the 51 previous competitors be invited to submit amended designs in accordance with conditions which should be decisively laid down by the assessors, each competitor receiving a small honorarium. This appears to be the only fair course open to bring about a satisfactory result and to rectify what has already become a public scandal.

In conclusion, we should have thought, considering the amount of controversy that has taken place with reference to the assessors' decision, they might at least have offered some explanation to the competitors in order to justify their action.—We are, &c.,

CLARK AND HUTCHINSON.

28, John-street, Bedford-row, W.C.

A new drill-hall for the local companies of rifle volunteers has just been completed at Arbroath, and will be opened in a few days. Messrs. Ford and Son were the contractors.

The arbitration award relating to the Ship Inn, Hotwell-road, Bristol, required by the corporation of that city for street improvement purposes, was reported. The amount of the claim placed before the arbitrator was £1,630, and the award was £3,818.

The strike at Lord Penrhyn's Welsh slate quarries, which had lasted three months, terminated by an intimation on the part of Lord Penrhyn that the quarries were closed from Friday night in last week. The older men who have remained at the quarries are to have a pension of a pound a month, and all under a certain age received a present of a sovereign on Saturday. A subscription which has reached considerable dimensions has been started for the benefit of the younger men who thus find their occupation gone. About half the men have, it is estimated, already found work elsewhere.

## Intercommunication.

### QUESTIONS.

[11691].—**Wall.**—A bought a plot of land with a certain frontage. The plot next adjoining was then sold, and preparations made for building upon it. The builder, B, was desirous of coming to an arrangement with A to build one of his external walls as a party-wall, partly on his own, and partly on A's ground. Terms, however, could not be arranged, and permission was refused, and the matter left on the understanding that the wall should not be built on A's ground. Now, after the wall is completed, A finds that the face of B's wall is the extent of his ground, and that, therefore, the footings of the wall must be on his ground. What are A's rights, and what should be the procedure in enforcing them?—H. E. A.

[11692].—**Long Galleries.**—What was the intended use of the long gallery as we find it in Elizabethan houses?—F. H. C.

[11693].—**Krenel or Crenelle.**—What is the precise meaning of this term? It does not always appear to mean the same thing. There are houses existing which never had a license to crenellate, which are built with battlements and otherwise fortified. I imagine that it meant something more definite than what our textbooks tell us.—F. H. C.

[11694].—**Braced Iron Arched Roofs.**—Can any reader kindly inform me of any modern publication which treats fully on braced arched iron roofs of large span, particularly as regards the strains. I have Fidler's "Bridge Construction," Anglin's "Iron Structures," and Rivington's "Building Construction"; but none of them go closely enough into this particular subject for my purpose. What sort of a book is Walmisley's "Iron Roofs" as regards strains?—C. E.

[11695].—**Waxing Oak Floor.**—A new English oak floor has just been laid, containing about 4,500 ft. super., and the owner has requested me to get this waxed-polished as quickly as possible. I should be much obliged if someone, who has had experience in this line, would kindly inform me of the *modus operandi*, and the most expeditious manner of doing same?—STUPID.

### REPLIES.

[11599].—**Cash Carrier.**—We beg to say that we are the original patentees and manufacturers of the "Newton-Walker Pneumatic Cash Carrier." Our last large installation was in Messrs. Jenner and Co.'s new premises, Princes-street, Edinburgh.—HENRY WALKER AND SON, LTD., Gallowgate Iron Works, Newcastle-on-Tyne.

### LEGAL INTELLIGENCE.

IN RE F. BULL, OF SOUTHAMPTON.—Frederick Bull, of Hill-lane, Shirley, formerly builder and contractor, attended for examination at the Southampton Bankruptcy Court, on Dec. 30. The bankrupt was formerly a member of the firm of Joseph Bull and Sons, who were made bankrupts in connection with their contract to build the new Law Courts in the Strand. After the bankruptcy the firm was formed into a company to finish certain contracts, and the bankrupt was made a director, but he had no beneficial interests beyond being paid £500 a year. He continued in that position until his illness at the beginning of last year. The company was being wound up. He took personally one or two contracts, but had no liabilities in respect of them. During the last 18 months he had been living on allowances made by his brother and friends, but he had not received much. The debtor was allowed to pass.

### CHIPS.

A memorial to Lord Leighton is to be placed in the nave of St. Paul's. It will take the form of an effigy of the late P.R.A., executed from a design by Mr. W. B. Richmond, R.A., and will cost about £2,000.

We understand that Mr. H. C. Eyres, London agent of the Coalbrookdale Co., Ltd., has resigned his position there, and assumed the position of manager of the architectural department in London of the Falkirk Iron Company.

The directors of the Blackpool Winter Gardens have appointed Messrs. Wylson and Long their architects for the construction of their new Floral Hall and executive offices, and also for the reconstruction of their pavilion, to convert it into one of the largest variety theatres in existence.

Mr. Alfred Waterhouse, R.A., has reported to the house committee of the Newcastle Infirmary, that having regard to its open position, the site of the present building is the best that could be chosen for the intended new structure. It would, he considered, afford ample space for the erection of a first-class modern hospital of 400 beds, and accommodation for 80 nurses, while the work of rebuilding could be carried out piecemeal without closing the existing institution.

Edward Devaney, a general dealer, of Blackfriars-road, was committed on Wednesday, from Southwark Police-court, on a charge of the manslaughter of William Densumbe, a master builder, in a street quarrel.

## Our Office Table.

It is announced in *A.A. Notes* that a committee of unusual size and interest has been formed to consider the celebration of the fiftieth anniversary of the London Architectural Association. It consists of the entire roll of 32 surviving Presidents from Professor Kerr onwards—letters from each of whom have been received expressing pleasure in being connected with the committee in this effort.

THE controversy as to the rebuilding of the gables on the west front of Peterborough Cathedral has been continued throughout the past week in the daily press; but nothing has been added to the sum of general knowledge, and the arguments pro and con have been restated in less exact language. The Secretary of the Society of Antiquaries has indulged in extravagant and hysterical lamentations, exclaiming that the grand west front of the cathedral "will never again be seen." As a matter of fact, however, the Dean and Chapter, although resolutely determined to adopt the recommendation of their professional advisers, do not possess the means of war, only the paltry sum of two guineas having been subscribed since November last, and they are at present waiting till the clouds roll by. Mr. T. Graham Jackson, R.A., penned a very guarded letter to the *Times* of Monday, pointing out that the memorial "now being signed by persons who have not examined the buildings themselves, and, who, if they did examine it, have not the knowledge of construction and masonry requisite to make their opinion of the slightest value" (ground which we took up weeks ago), asking the Dean and Chapter to reconsider their decision, is irrational and impertinent, as it tends to complicate a very difficult question.

MR. JOHN OLDRID SCOTT, F.S.A., wrote on the same day reminding the public that Mr. Pearson's experience in dealing with old churches is quite unrivalled, while the practical knowledge and sound judgment of Mr. John Thompson, the contractor, are also unequalled. Mr. Scott makes the safe prediction that, when the reconstruction has been completed, not one in a hundred of the objectors will be able to see that any rebuilding has taken place. Professor Baldwin Brown, of Edinburgh University, also joined in the fray, urging that Mr. Pearson and Sir A. Blomfield are so much alike in standing, education, and traditions, that the opinion of the two gives no more ground for confidence than the one. Mr. J. T. Micklethwaite, F.S.A.—whose recent repairs at Kirkstall Abbey did not pass without hostile comment any more than Mr. Jackson's work at St. Mary's spire, Oxford—discounts the remarks of Messrs. Jackson and Scott, on the ground that they belong by tradition and practice to the same school as the architects called in by the Dean and Chapter. In a trenchant reply, Mr. Jackson points out that he has not ranged himself on the side of the Dean and Chapter, adding, "Mr. Micklethwaite and I were trained in the same school, and I have seen restorations by him which are carried further in the direction of renovation than I should have taken them. He calls my sorrow at the necessity of rebuilding the west front—though I never said it was necessary—conventional, by which I suppose he means insincere. This confirms what I said: that he and his companions allow no one to love an old building but themselves."

MR. R. SMEATON DOUGLAS, of the Art School, St. Andrew's, N.B., draws attention to the neglected condition of the interesting Norman church at Leuchars, Fifeshire. Its state is, he declares, "disgraceful, and most discouraging to those who have patriotic and traditional sentiments, apart from its architectural importance to students and its hereditary value to craftsmen." There is at present an aperture in the roof freely admitting the weather; the window frames are quite insecure at the mitre-joints as elsewhere; while the zinc canes are contained by undulatory planes of parabolic and elliptic section, consequently fractured glass is the inevitable accompaniment. The exterior wall-joints, where not occupied by luxuriant grasses and foliage, are open enough to freely admit one's finger tips, the result being that the interior walls present an appearance in colour similar to that seen after some conflagration—black, grimy, and stained; while a highly deleterious corrosive growth seems to flourish with impunity. Some



very beautiful carving has in this way suffered irrevocably. On the interior angle of the south-east window of the apsidal end of the church a characteristic cushion capital is seen, having on its two exposed crenated surfaces carved bird forms—the only applied organic decoration in the whole interior. This has suffered much through want of timely care; the carved relief of some parts having quite mouldered off, leaving, however, the outline quite visible, while the conventional rendering of the body, happily, is as yet perfectly preserved, as also the beautiful pellet decoration at the angle. Another highly interesting double-cushioned capital on the lower arcade of the north side, showing a unique design of radiating anthemion forms, combined with well known caulicoli, is almost undecipherable. To architectural students this is a most significant detail, showing the influence of the Byzantine and Roman schools on Norman work.

We have received a useful "calculator," which will be found of great service to all architects, surveyors, and others engaged in building estimates and calculations. The "Timber Calculator" is a folded card containing easy tables, which enable the cost of timber or stone, &c., to be obtained from lin. by  $\frac{1}{2}$  in. and upwards, at any price per standard or per cube foot. Mr. Greenwood's invention practically supercedes the tedious operation of "supering" and cubing, and will be a boon to all who have to calculate small-sized timber. The author observes, his "object is to dispense with the great labour in dividing, subtracting, and supering when pricing out accounts or casting up." The examples given, showing the method of using the calculator, are clear and so simple that any intelligent office boy can apply it. The two tables give all that is necessary, and it is this conciseness which renders Mr. Greenwood's calculator so valuable to the architect or surveyor. We heartily recommend the calculator to the profession as a simple and practical saver of time and labour. It can be obtained of the inventor, J. Harry Greenwood, West Drive, Mansfield, Notts, price 1s. 3d., post free.

EXPERIMENTS on the strength of Georgia pine, a timber largely used for building, have been made by Mr. Harry Mills, and are described in the *Southern Architect*. From these experiments it is clear the strength of the timber (and the same fact applies to all timber more or less) depends upon the degree of seasoning as well as the part of the tree from which the test piece is taken, and the position of the grain in relation to the direction of strain. In twelve tests of green timber taken from all parts of the tree, an average modulus of rupture of 9,313lb. per square inch was found. Seven tests of seasoned timber gave an average modulus of rupture of 10,524lb. per square inch, showing that the seasoning adds about 13 per cent. to the strength of the green timber. The stronger timber was found in the butts of the trees, and the heart is, of course, stronger than the sap wood. Other facts are given in the description.

MESSRS. B. FINCH AND CO., LTD., of 82, Belvedere-road, Lambeth, the well-known sanitary engineers, have issued a handy and comprehensive Architects' and Surveyors' Diary for 1897, which will be found most useful. On pages 6, 10, and 178 will be found particulars which are not to be found in the trade and professional manuals. On p. 6 is a very useful table of diameters of serving pipes to sanitary fittings, which plumbers too often seem ignorant of, and the table showing the number of gallons required to flush drains properly will save many stopped pipes. We hope to welcome Messrs. Finch and Co.'s diary as an annual fixture.

The plans sent in by Mr. J. H. Swainson, M.S.A., Wrexham, for the new church, to be called St. Peter's, and to be erected at Rhosrobin, in the parish of Rhosddu, a suburb of Wrexham, have been adopted by the building committee. Operations, it is expected, will shortly be commenced.

The new post-office at Harrogate was opened on Monday. The building is exceedingly plain in character. The architect is Mr. H. Tanner, of Her Majesty's Office of Works, Whitehall, London. The style is the Perpendicular, freely treated, built in stone, with dressings of Pateley Bridge stone. The building has been erected at a cost of upwards of £9,000. It stands on a corner site at the junction of Chapel-street and Cambridge-road. The contractors were Messrs. William Ives and Son, of Shipley.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. "The Future Development of the Surveyors' Institution," by Howard Martin, F.S.A. 8 p.m.  
Royal Institute of British Architects. Business Meeting. 8 p.m.  
Liverpool Architectural Society. "Belgian Churches," by C. E. Mumford. 8 p.m.  
TUESDAY.—Institution of Civil Engineers. "Superheated Steam Engine Trials," by Professor W. Ripper, M.Inst.C.E. 8 p.m.  
WEDNESDAY.—Northern Architectural Association. Paper on "Fireclay Manufactures." 7.30 p.m.  
FRIDAY.—Architectural Association. "Decorative Plaster-Work," by E. Proleau Warren. 7.30 p.m.

## CHIPS.

Extensive additions have recently been made to the Peak Hydropathic, Buxton, including new ball-room, sitting-room, bed-rooms, &c. The architect of the new building is Mr. Charles Heathcote, and the builder carrying out the work under his superintendence is Mr. James Byron, of Bury.

The scheme for the construction of an undercliff drive at Bournemouth and the preservation of the cliffs, prepared by Mr. F. W. Lacey, the borough surveyor, was considered at the town council's meeting on Wednesday. A resolution was carried by twelve votes to nine approving the scheme, and authorising it to be submitted for approval to Sir George Meyrick, the owner of the cliffs, and the directors of the South-Western Railway, and secure their co-operation in carrying it out. The cost is estimated at £60,000 for the whole sea-front; but only half can be proceeded with at present.

Branch banking premises in Belle Vue-road, Exmouth, were opened last week. They have been built from plans by Mr. Charles Cole, of High-street, Exeter. The floors are fireproof, and have been constructed by Messrs. Mark Fawcett and Co., of Westminster. Mr. A. Honeyman, of Exmouth, was the builder, and Mr. T. R. James the clerk of works.

The town council of Eccles, near Manchester, considered on Monday the revised plans and estimates which Mr. Bagot, architect, had prepared for the town-hall extension scheme, which he estimated could be carried out for about £4,500. The revised plans were approved by a committee, who recommended that the persons who tendered previously should be given an opportunity of sending in amended tenders in accordance with the revised plans. The recommendation was adopted.

A fire broke out on Wednesday at the Greek Cathedral at Cattaro, in Dalmatia, which was completely reduced to ashes, together with the adjacent artillery barracks. The damage caused by the destruction of the church is estimated at 100,000 florins. No one was injured.

Lord Harlech, the Provincial Grand Master of North Wales, opened at Amlwch on Tuesday a Masonic hall, erected by the brethren of the St. Eleth Lodge (1488). The plans were prepared by Bro. R. G. Thomas, P.P.G.S. of W., architect, Menai Bridge. The building has been so arranged that it can be utilised for general purposes.

The Berwick Town Council considered on Tuesday the question of altering Berwick Bridge, or providing a new foot bridge from Berwick to Tweedmouth. Messrs. Sandeman and Moncrieff, of Newcastle, the engineers, considered the making a one-sided foot-path on old bridge disadvantageous, and an overhead bridge so ugly that they would not engineer it. The committee are now to consider a cheaper plan than £6,000.

Mr. E. B. Newton, P.A.S.I., of the city surveyor's office, Carlisle, has been selected, out of a large number of candidates, for the appointment of engineering assistant to the borough engineer of Rochdale. Mr. Newton served his articles with the late surveyor of Carlisle, Mr. W. Howard-Smith, Assoc.M.Inst.C.E., &c.

A large cold-air store for the Colonial Consignment Company, of London, is to be erected at Mode Wheel, on the Manchester Ship Canal, for the storage of Australian and New Zealand produce. The architect is Mr. Charles Heathcote, of Manchester. The total cost will be about £50,000. The contract for the foundations has been let to Mr. James Nuttall, of Manchester.

The German Emperor has designed and drawn with his own hand the tower of the German Protestant Church in Jerusalem, which will be finished by the beginning of 1898. The original plan of the church was drawn in 1875 by the head of the Prussian official architects, Professor Adler, and the cost was estimated at £25,000. But the first design has been considerably altered, and the building will cost about £15,000 more. It will be built on the Muristan, and is in plan and style similar to the churches built in Palestine and Syria by the Crusaders.

## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian .....	£5 5 0	to £6 0 0
Rolled-Steel Joists, English .....	6 0 0	" 6 10 0
Wrought-Iron Girder Plates .....	6 15 0	" "
Bar Iron, good Staffs .....	7 0 0	" 7 5 0
Do., Lowmoor, Flat, Round, or Square .....	17 0 0	" 17 10 0
Do., Welsh .....	5 15 0	" 5 17 6

## Boiler Plates, Iron—

South Staffs .....	7 16 0	" 8 0 0
Best Snedshill .....	9 0 0	" "

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £8 10s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £13 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge .....	£10 15 0	to £11 0 0
Best ditto .....	11 5 0	" 11 10 0

	Per ton.	Per ton.
Cast-Iron Columns .....	£5 10 0	to £8 10 0
Cast-Iron Stanchions .....	5 10 0	" 8 10 0
Cast-Iron Sash Weights .....	—	" 4 2 6

	Per ton.	Per ton.
Cast-Iron Socket Pipes—		
3in. diameter .....	4 10 0	" 4 15 0
4in. to 6in. .....	4 5 0	" 4 10 6
7in. to 24in. (all sizes) .....	4 0 0	" 4 2 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

	Per ton.	Per ton.
Fig Iron—		
Cold Blast, Lilleshall .....	105s.	to 110s.
Hot Blast, ditto .....	57s. 6d.	to 62s. 6d.
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes .....	75p.c.	Fittings 77p.c.
Water-Tubes .....	70	" 72½
Steam-Tubes .....	62½	" 65
Galvanised Gas-Tubes .....	69	" 62½
Galvanised Water-Tubes .....	55	" 57½
Galvanised Steam-Tubes .....	45	" 47½

	10cwt. casks.	5cwt. casks.
Sheet Zinc, for roofing and working up .....	£20 10 0	to £21 10 0
Sheet Lead, 3lb. per sq. ft. super .....	12 15 0	" 13 0 0
Fig Lead, in 1cwt. pigs .....	11 13 9	" 11 15 0
Lead Shot, in 25lb. bags .....	15 0 0	" "
Copper Sheets, sheathing and rods .....	55 0 0	" "
Copper, British Cake and Ingots .....	52 0 0	" 53 10 0
Tin, Straits .....	59 15 0	" 60 0 0
Do., English Ingots .....	63 10 0	" 65 10 0
Spelter, Silesian .....	17 0 0	" 17 5 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in. ....	8 5 0	" "
Cut Floor Brads .....	8 0 0	" "

	Per ton.	Per ton.
Wire Nails (Points de Paris)—		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/3 16/3		per cwt.

## TIMBER.

Teak, Burmah .....	per load £13 10 0	to £16 0 0
" Bangkok .....	12 0 0	" 15 0 0
Quebec pine, red .....	—	" "
" yellow .....	2 0 0	" 4 0 0
" pitch .....	—	" "
" Oak .....	4 15 0	" 5 15 0
" Birch .....	3 10 0	" 5 0 0
" Elm .....	3 5 0	" 4 10 0
" Ash .....	2 10 0	" 3 15 0
Danitic and Memel Oak .....	2 10 0	" 3 10 0
Fir .....	2 10 0	" 4 5 0
Wainscot, Riga p. log .....	2 10 0	" 4 10 0
Lath, Danitic, p.f. .....	4 10 0	" 5 10 0
St. Petersburg .....	5 0 0	" 6 10 0
Greenheart .....	8 10 0	" 9 0 0
Sequoia, U.S.A. .... per cube foot	0 2 0	" 0 2 2
Mahogany, Cuba .....	0 0 4½	" 0 6
" Honduras .....	0 0 5	" 0 6½
Cedar, Cuba .....	0 0 4½	" 0 5
" Honduras .....	0 0 4	" 0 5
Walnut, Italian .....	0 0 3½	" 0 7

Deals, per St. Petersburg Standard, 120—12ft. by 1½ in. by 1½ in. —

Quebec, Pine, 1st .....	£21 0 0	to £24 0 0
" 2nd .....	15 0 0	" 17 0 0
" 3rd .....	7 10 0	" 11 0 0
Canada Spruce, 1st .....	9 0 0	" 10 10 0
" 2nd and 3rd .....	7 10 0	" 8 10 0
New Brunswick .....	7 5 0	" 8 15 0
Riga .....	7 0 0	" 8 0 0
St. Petersburg .....	8 0 0	" 13 0 0
Swedish .....	8 10 0	" 16 0 0
Finland .....	8 10 0	" 9 0 0
White Sea .....	10 0 0	" 16 10 0
Battens, all sorts .....	5 0 0	" 20 0 0

	Per square of in.	Per square of in.
Flooring Boards, per square of in. —		
1st prepared .....	0 9 6	" 0 16 6
2nd ditto .....	0 8 0	" 0 13 0
Other qualities .....	0 6 0	" 0 7 6

	Per square of in.	Per square of in.
Staves, per standard M:—		
Quebec pipe .....	—	" "
U.S. ditto .....	35 0 0	" 42 10 0
Memel, cr. pipe .....	225 0 0	" 240 0 0
Memel, brack .....	200 0 0	" 210 0 0

## OILS.

Linseed .....	per ton £15 7 6	to £16 0 0
Rapeseed, English pale .....	27 10 0	" 28 0 0
Do., brown .....	27 0 0	" 27 10 0
Cottonseed ref. .....	15 10 0	" 16 0 0
Olive, Spanish .....	29 0 0	" 30 0 0
Seal, pale .....	23 0 0	" 24 0 0
Cocconut, Cochin .....	28 0 0	" "
Do., Ceylon .....	24 0 0	" "
Palm, Lagos .....	24 10 0	" 25 0 0
Oleine .....	19 0 0	" 20 0 0
Lubricating U.S. .... per gal.	0 6 3	" 0 7 6
Do., black .....	0 4 9	" 0 6 6
Tar, Stockholm .....	1 0 0	" "
Archangel .....	0 12 6	" "
Turpentine, American .. per ton	22 7 6	" 22 12 6



## LIST OF COMPETITIONS OPEN.

Colwyn Bay—Electricity Lighting Scheme	£30 (merged in commission), £23	Jas. Porter, Clerk, Urban District Council, Colwyn Bay	Jan. 12
Wood Green, Tottenham—Higher Grade Schools (960 places)	No premium; 31 per cent. commission	J. F. Adams, Clerk to Tottenham School Board, Offices, Tottenham	15
Sunderland—Technical School (£18,000 limit of cost)	£100, £50, £25	Fras M. Bowey, Town Clerk, Sunderland	16
Cobham, Surrey—Sewerage and Sewage Disposal Schemes	25rs. (to merge in commission)	W. O. Reader, Clerk, Epsom R.D.C., Lonsdale, Epsom	16
Morley—Public Baths	£30 (merged), and £15	R. Burrough Hopkins, Town Clerk, Morley	25
Sutton St. Edmund—School (100 places, £900)	No premium; 5 per cent., inc. com.	R. P. Mossop, Clerk to Sutton School Board, Holbeach	30
Worcester Corporation—Sewage Disposal		Samuel Southall, City Clerk, Worcester	31
St. Gilles, near Brussels—Town Hall (£42,000 limit of cost)	£160 and two lesser premiums	Communal Authority, St. Gilles, Belgium	Feb. 1
Building Trades Exhibition Poster		The Manager, 43, Essex-street, W.C.	1
Dudley—Grammar School and Master's House	£50, £30	Albert Morton, Clerk to Governors, 15, Birmingham-road, Dudley	15
Christiania—Railway Terminal Station Plans	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s.	Railway Offices, 6, Victoria-terrace, Christiania	Mar. 31
Osgodby, Lincolnshire—Wesleyan Chapel & Schools (cost £600)	No premium	E. H. Davy, Secretary to Trustees, Kirkley, Market Rasen	—
Eccleshill, Bradford—Sewage Disposal	£20, £10	Jos. Richardson, Clerk, U.D.C., 4, Town Hall-square, Bradford	—
Spalding—Extending Corn Exchange (£3,000 to £5,000 probable cost)	£15	The Clerk to Urban District Council, Spalding	—
London—Electric Omnibus and Cab Designs	£150, in three premiums	Sec., London Electric Omnibus Co., 6, Northumberland-av., W.C.	—
Auckland, New Zealand—Stock Exchange, Queen-street	£150 and £75	R. E. Isaacs, Secretary, 29, N.Z. Insurance Buildings, Auckland, N.Z.	—
Teddington—House Plans, Broom Water Estate	£20, £10, £5	J. C. Hill, London Brick Co., 7, Archway-road, Upper Holloway	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Tarmon, Co. Clare—Creamery	Manchester Co-op. Wholesale Society	W. L. Stokes, Mulgrave-street, Limerick	Jan. 9
Bury, Lancs.—Baptist Chapel and School, Manchester-road	Corporation	Thos. Nuttall, Architect, 20, Market-street, Bury	11
Leicester—Branch Free Library, Belgrave-road		A. H. Hind, A.R.I.B.A., 3, Greyfriars, Leicester	11
Halifax—Additions to Trinity Boys' School		Jackson and Fox, Architects, 22, George-street, Halifax	11
Holbeck, Leeds—Shed and Closets at Workhouse	Board of Guardians	—, Moore, Union Clerk, Holbeck	11
Croydon—Repairs to Infirmary Block	Board of Guardians	H. List, Clerk, Mayday-road, Thornton Heath	11
Walsall—Alterations, 13 and 14, Goodall-street	Corporation	J. R. Cooper, Town Clerk, Borough Offices, Walsall	11
Weston-super-Mare—Additions, Albert Memorial Schools		S. J. Wilde, Boulevard Chambers, Weston-super-Mare	12
Wimbledon—Additions to Mortuary at Cemetery	Urban District Council	W. H. Whitfield, Clerk, Broadway, Wimbledon	12
Leeds—Detached House at Roundhay	J. Walker	W. Carby Hall, A.R.I.B.A., Park-row, Leeds	12
Port Said—Petroleum Warehouse	Customs Officials	Ministry of Public Works, Cairo	12
Aberystwith—University College Superstructure	Trustees	Chas. F. Ferguson, Architect, 42, Clareville-road, S. Kensington	12
Liverpool—Railway Goods Warehouse	Manchester, Sheffield, &c., Railway	Oliver S. Holt, Secretary, London Road Station, Manchester	12
Norwich—Converting Old Museum into Public Baths	City Council	Geo. B. Kennett, Town Clerk, Guildhall, Norwich	12
Exmouth—Shop in Rolle-street		W. J. Morley, Architect, 289, Swan Arcade, Bradford	12
Great Horton, Bradford—Jamworks and Houses		S. Jackson and Son, Architects, Tanfield Chambers, Bradford	13
Cockermouth—Bank Premises	Carlisle and Cumberland Bank Co.	G. Dale Oliver, F.R.I.B.A., Carlisle	13
Bradley, Yorks—Primitive Methodist Chapel		Jas. Hartley, Architect, Exchange-buildings, Skipton	13
Morley—House and Shop, Queen-street		Geo. B. Clegg, Architect, 2, Peel-street, Morley	13
Newpark, Killmallock—Dairy Factory	Geo. Jackson	P. Lynch, Charleville, Cork	13
Leytonstone—Boiler House at Workhouse	West Ham Board of Guardians	F. E. Hilleary, Clerk, Union-road, Leytonstone	13
Stokeby, Norfolk—Classroom and Offices	School Board	H. Chamberlain, Clerk, 13, Queen-street, Great Yarmouth	13
Wimbleton—Five Cottages, Hubert-road		Wm. Cooper, M.S.A., 21, Havelock-road, Hastings	14
Christchurch—Water Tower at Southbourne	West Hants Water Co.	S. Newlyn, Secretary, Stour-road, Christchurch, Hants	14
Cork—Labourers' Cottages	Board of Guardians	John Cotter, Clerk, the Workhouse, Cork	14
West Lavington—Additions to Dauntsey Elementary Schools	Governors	C. E. Ponting, F.S.A., Architect, Marlborough	15
Sowerby—Methodist New Connexion Chapel	Restoration Committee	Edmilfes, Architects, Todmorden	16
Broad Hamston—Church Roof Restoration	London and Yorkshire Banking Co.	Edmund Sedding, Architect, 12, Atheneum-street, Bristol	16
Morley—Bank Premises		Wm. Bakewell, F.R.I.B.A., 23, Park-square, Leeds	16
Alnwick—Choir Vestry at St. Paul's Church	School Board	Forster and Paynter, Solicitors, Fenkle-street, Alnwick	16
Paisley—School in Carbrook-street, 800 places	Major Beecher	Chas. Davidson, Architect, Terrace-buildings, Paisley	16
Wadebridge—Alterations, Govenna House	School Board	The Proprietor, Wadebridge	16
Bedlington—Infants' School	Corporation	James and Morgan, Architects, Charles-street Chambers, Cardiff	16
Birkenhead—Pavilion at Fever Hospital, Playbrick-hill		Alfred Gill, Town Clerk, Birkenhead	16
Pontypool—Shops and Offices, Crane-street	School Board	Robert Williams, Architect, Osborne Chambers, Pontypool	16
Burnham-on-Crouch—Schools	Geo. Douglas	Fred. Chancellor, F.R.I.B.A., Chelmsford	16
Alnwick—Four Cottages at Christon-bank	Admiralty	M. Temple Wilson, Architect, 69, Narrowgate, Alnwick	16
Harwich—Coastguard Station Repairs		Director of Works, 21, Craven-street, W.C.	19
Paddington—Two Iron Fire-Escape Staircases, Workhouse	Paddington Board of Guardians	H. F. Aveling, Clerk, 289, Harrow-road, W.	19
Infirmary, Harrow-road		John Kirk and Sons, Architects, Huddersfield	21
Skelmanthorpe—Engine House and Weaving Shed	Admiralty Commissioners	Director of Admiralty Works, 21, Craven-street, W.C.	22
Dungeness, by Dungeness—Officers' House, Coastguard Station	Tynemouth School Board	Marshall and Dick, Architects, 4, Northumberland-st., Newcastle	22
North Shields—Coach-lane Schools	Dean and Chapter	Fred. K. Bowker, Chapter Clerk, Winchester	25
Winchester—Converting Prebendal House into Judge's Lodgings	District Board of Works	W. H. Fairfield, Clerk, 117, High-street, Poplar	25
Poplar, E.—Refuse Destructor, Carl Sheds, &c.	West Ham School Board	C. W. Carrall, Clerk, Broadway, Stratford	26
Stratford, E.—Whalebone-lane Schools	H.M. Works Commissioners	Hon. Reginald B. Brett, 12, Whitehall-place, S.W.	26
Colchester—Enlargement, P.O. Sorting Office	London County Council	C. J. Stewart, Clerk, Spring-gardens, S.W.	26
North Woolwich—Fire Station	London County Council	C. J. Stewart, Clerk, Spring-gardens, S.W.	26
Bethnal Green—Dwellings on Boundary-street Area	Board of Guardians	F. S. Chandler, Clerk, Oldham, Hants	29
Winchfield—Additional Vagrant Wards, Union House		Le Societe des Abbatoires, Belgrade, Roumania	Feb. 1
Belgrade—Cold Store for Slaughter-house	Egyptian Government	Office, Ministry of Public Works, Cairo	—
Cairo—Arabic Museum and Khedival Library		Owners, The Firs, Sydenham Hill, S.E.	—
Building Contracts in Four to Six Lots (£150,000)		C. F. Underhill, New-street, Burton-on-Trent	—
Burton-on-Trent—Minister's House, Shobnall-street		H. Tudor Thorneley, Architect, 104, St. Mary-street, Cardiff	—
Cadoxton-Barry—Hotel, at Mount Pleasant		A. E. Sidford, Architect, Wokingham	—
Bracknell, Berks.—Two Houses and Shops		Joseph Stott and Sons, Architects, Clegg-street, Oldham	—
Rochdale—Additional Story to Mill		J. W. Sutherland, Architect, Church View, Norden	—
Norden—Workshop and Showroom		H. S. White, Architect, 318, High-road, Chiswick	—
Chiswick—Four Houses, Duke's-road		Geo. Barnes, Mendlesham, Suffolk	—
Mendlesham—Enlarging Endowed Schools		Isitt, Adkin, and Hill, Architects, Presidential Buildings, Bradford	—
Ilkley—Residence	Corporation	Reginald Pope, Architect, Radnor Chambers, Folkestone	—
Folkestone—Public Baths	Manchester and Co. Bank	J. Eaton and Sons, Architects, Ashton-under-Lyne	—
Glossop—Branch Bank		Isitt, Adkin, and Hill, Architects, Presidential Buildings, Bradford	—
Gretland—Reseating Wesleyan Chapel		J. Grindy and Sons, Architects, 12, Brazenose-street, Manchester	—
Whitefield, Lancs.—Detached House, Church-lane		John Holt, C.E., 6, St. Mary's Gate, Manchester	—
Pendleton—Construction of Bowling Green		Robert Tait, Erskine-place, Pumpherson, N.B.	—
East Calder, N.B.—Cottage and Stable		Wm. Holdridge, 5, Upper Accommodation-road, Leeds	—
Leeds—Eight Houses, Richmond Hill		J. C. Spivey, Architect, Old Park-road, Roundhay, Leeds	—
Leeds—House in Roundhay-road		H. H. & E. Cronk, Architects, 4, Mount Ephraim-rd., Tunbridge Wells	—
Tunbridge Wells—Houses in Vale Royal		E. Fearnly Bishopp, Architect, Ipswich	—
Thorndon, Suffolk—School at Kerrison Reformatory		A. N. Bromley, Architect, Queen-street, Nottingham	—
Nottingham—Re-erection, Dunkirk School	School Board	John Hutton, M.S.A., Kendal	—
Kendal—Stables and Coachhouse at Highgate	Greenwood and Littlewood	William Boyer, M.S.A., 10a, Cowgate, Peterborough	—
Peterborough—Two Houses, Broadway		F. H. Cooke, Surveyor, Priestgate, Peterborough	—
Peterborough—75 Houses	Keeble Brothers	C. and L. Owen, Architects, 104, Commercial-street, Dunee	—
Dunee—Pearl Assurance Buildings		Musgrave and Peacock, Architects, 46, Wind-street, Swansea	—
Port Talbot—Four Shops		Jos. F. Walsh, Architect, Bank Chambers, Halifax	—
Lightcliffe, Halifax—Residence and Stabling		P. Palgrave and Co., Architects, 12, Victoria-street, S.W.	—
Hampstead—Residential Flats		H. Hardaker, Architect, Ivetgate Chambers, Bradford	—
Manningham, Bradford—Converting Four Houses into Shops		Jno. Haggas, Architect, North-street, Keighley	—
Keighley—Congregational School-Chapel, Fell-lane		107, Lonsdale-street, Bradford	—
Bradford—House and Stable		Jones, Richards, and Budgen, Architects, St. Mary-street, Cardiff	—
Cardiff—Rebuilding 1, Adam-street	Rogers, Ltd., Bristol	Baker and May, Architects, Head-street, Colchester	—
Colchester—Two Houses, Creffield-road			—

## ENGINEERING.

Irvine—Three Filters at Greenhead	Corporation	Jas. Dickie, Town Clerk, Burgh Chambers, Irvine, N.B.	Jan. 11
Kettering—Sludge Pressing Plant	Urban District Council	T. Reader Smith, Engineer, Market Hill, Kettering	11
Cosenza, Italy—Water Supply (£24,000)	Municipality	The Secretary, Cosenza	11
Glencarn—Lake Construction		—, Murray, Agent, Glencarn Estate, N.B.	11
Derby—Urinal, Bradshaw-street	Corporation	R. J. Harrison, Borough Engineer, Bebbington-lane, Derby	11
Dover—Supply and Construction of Tramways (3 miles)	Corporation	E. W. Knockor, Town Clerk, Castle Hill, Dover	19
Manchester—Steam Tug on Canal (60ft. by 13ft.; 4ft. 6in. draught)			—
Grao, Valencia—Harbour Piers (£540,000)	Corporation	R. D. Callison, Town Hall, Manchester	13
Christchurch—Water Supply Works	Official	Direccion General de Obras Publicas, Madrid	14
Monte Video—Electric Light Installation	West Hants Water Co.	S. Newlyn, Secretary, Stour-road, Christchurch, Herts	14
	Uruguayan Government	The Ministry of Finance, Monte Video, Uruguay	15



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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## ARCHITECTS AND ANTIQUARIES.

THE controversy which has been going on in the newspapers during the past two months on the restoration of the west front of Peterborough Cathedral has revealed certain differences amongst architects, or perhaps it would be more correct to say two schools of thought. It would otherwise be rather difficult to explain the obvious want of agreement and sympathy which has manifested itself among members of the profession. Except on this ground, or some other ulterior reason, we cannot understand the hesitancy expressed among leading members to come forward and affirm their agreement with the Dean and Chapter and their official advisers. Either the west front of that fine edifice is in a safe condition or in an unsafe and dangerous state. If the former, then any tampering with the structure would be a wanton and mischievous interference; but if it is, as stated to be on good authority, in a perilous case, it is only reasonable that the decayed portions should be attended to, and if necessary be rebuilt without delay. Any half-measures of repair, such as that proposed by the Society of Antiquaries, would be useless, for we are assured, on the authority of the Dean and Chapter, that "the method of repair suggested by the Society is neither suitable nor possible in this case." The plan proposed is to underpin and secure the great piers and added porch, and to remove from behind the decayed rubble walling, by small sections, without disturbing the facing stones. We do not now intend to deal with the question further (we have from week to week reported the pros and cons. of restorers and anti-restorers), for without a personal examination of the actual construction and the condition of the masonry, it is absurd to express any independent definite opinion on the subject. We have here, at any rate, two very distinct and antagonistic views which might equally be applied to any case of restoration besides that at Peterborough. They form, in fact, two very decided factions amongst architects as well as antiquaries, for it is not even every antiquary that is adverse to restoration. But one would have thought that, in a case so clear as the one under consideration appears to be, there could be only one opinion expressed. Not so! Architects are not unanimous upon this any more than they are upon questions of education, the value of examination, or on style. There must be two parties to every question, not because there can be any doubt as to actual facts, but because it is the "proper thing." Two eminent surgeons, or lawyers, or architects must have each his own opinion, or it would not be professional; for if all had the same opinion there could be no rivalry nor emulation, and one man would be as good as another. We must make some allowance for this very pardonable divergence of opinion when we ask the very reasonable question, How it is that doctors can differ upon such very ordinary matters as those of building construction, upon a practical point that could be set at rest in a few moments by anyone who had practical knowledge of the facts? Two medical experts could hardly differ more upon a diagnosis of a malady which, if left to itself, could not but prove fatal. They would agree, probably, as to what the disease really was, and what the only remedy would be, even if they did not precisely agree as to the exact method, or the extent of the actual mischief.

Yet a surgical case is often much more complex and difficult to determine than a practical building operation, where an examination of the structure ought to determine a definite course of action.

There are clearly two schools of architects—those who are builders, and those who are chiefly in their sympathies archaeologists. The restorer of ancient buildings may be one of the former, though certainly not an iconoclast in any sense. He may, in fact, have as much a desire to spare old work as the mere antiquary; but he does not scruple to exercise his art, and to rebuild, if need be, any portion of the building which is decayed or in a ruinous condition. The other is first a preserver at any price, and would retain as a record all that he can, and both act on logical principles. We do not deny there have been ignorant and unscrupulous restorers who, while they think they are perpetuating a fine building, are really destroying it, and we have had a good deal of wholesale and indiscriminate restoration of this kind. And it is this fact that has called into existence that uncompromising individual, the "anti-restorer," who protests against all restoration, no matter how careful, reverent, and sympathetic it may be. So one extreme begets another. If these two factions always acted upon logical principles, there could be nothing to be said against them; but we may question whether they always do so. Some of those, for instance, who have protested most loudly against rebuilding the Peterborough gable, and have given their opinion, have been engaged in similar undertakings as restorers; therefore as malcontents their advice does not come with the best of grace. It puts one in mind of the admonition: "Employ me, and all will be right." What might have been the result had the relative positions of the combatants and official architects been reversed we dare not say; we can only take cognisance of the fact of the two sides on this question. When the public are told by one architect that two eminent men in the Gothick ranks make it appear that the opinion of architects is upon the side of the authorities, and that "both belong by tradition and practice to the same school as Mr. Pearson and Sir A. Blomfield," and that they are in sympathy with those whose ideas of "restoring" an ancient building is to "make it into a new one," what is the average reader to think of one member of the profession making it appear that the leading men in the same profession are so heartlessly indifferent to the claims of our ancient buildings? Anti-restoration, or the "adoration of the antique," is now a cult. The amateurs and antiquaries are all on one side, joined as they are by a few conservative architects, who make it a business to pitch into any legal custodians of our old buildings, and to wage war with the school of restoring architects.

The division of the profession into two classes, which we may conveniently name the "building" and the "historic" schools of art, or the practical and the æsthetic factions, is a condition of the present age which we cannot ignore. Upon these two divisions the education and practice of architects turn, and the difference between them appears to grow in intensity. And it is of no purpose that exponents of art try to reconcile them—to persuade practical men to study art and artists to make themselves craftsmen. Whatever may be done in this way, there will always be these two aspects. The practical builder who has little sentiment in his nature will always be in evidence; he does not trouble about style or age or picturesque qualities, but is ready to make plans and build to any requirements; it may be in bad or good taste—it is a matter of business to him. That he is logical few will deny, for to do him justice, he does not mince matters. His plan is dictated by the absolute requirements of the case, as far as

elevation goes: it is a simple outgrowth of plan and section. With him it is rather "What to use" than "How to adapt." If he is restoring an old building, he does not hesitate to take down and rebuild, either following the old or without any reference to it. And in all this, the practical builder is following the old Mediæval builders, who, when they wanted to enlarge a church, did so by adding an aisle, or by lengthening the church by throwing out a transept or two in a later style, as are found at Winchester; often by enlarging the choir, as by the addition of aisles or by adding eastern bays, as at Ripon; or a chapel, as the elaborate Late Gothic one at Westminster Abbey, where the Late Henry VII.'s style was tacked on to an Early English apse. How many of our old parish churches show a Perpendicular Lady chapel beyond the Early English chancel? On the other hand, reserve and restraint are the watchwords of the party whom we have called the "historic" or "æsthetic." But they lack confidence in their resources. They look on their art as antiquarianism. More sensitive and sympathetic of old work, they regard it to be a duty to preserve as long as possible the traditions upon which their art has been founded and evolved. Regarding it as a study of the past only, the disciples of this school refuse to discard antiquity. Their notion of architecture as a profession is, therefore, unreal. No one will deny that their work is often characterised by more feeling and artistic perception than that of the other school; that their methods should be different; that in the educational movement they should hold back and protest against the technical spirit and the professional standards which prevail; and it is, therefore, as reasonable that these two schools should subsist side by side, as that there should be a spirit of rivalry among politicians and other classes of the community. What is more strange is that the party of restraint includes men of restoring proclivities, and that popular opinion has been tried to be enlisted in favour of preserving rather than rebuilding or imitating our old buildings—a very opposite spirit to that which prevailed forty years ago.

## SHORTCOMINGS OF THE MODERN SPECIFICATION.

ONE of the consequences of our present loss of touch with actual building and craftsmen, is the deterioration in value of the modern specification and its ambiguity. It is becoming less a living and faithful embodiment of the wants of the trades than formerly. The very phrases and expressions have lost their original significance. Take an old treatise that originally had a value. Repeated revisions by incompetent and unpractical editors and interpolators have made it a mere book of verbiage and stereotyped expressions, and the real value of the work is gone. Additions and glosses have been made by those who only have a second-hand knowledge of the science or trade. The ordinary specification is a document which has undergone a similar transformation of character. The first document written by a practical man who knows every trade from actual experience, is improved upon by his successor; the phrases and clauses are amplified or abridged, as the case may be, and without any reference to the actual building. This form is again and again subjected to the same process of pruning and emendation, softening here a provision or adding another from a very superficial acquaintance of the subject, and in the course of time the original document, framed to meet special requirements, has so lost its character and practical point that it becomes a very emasculated edition of its original self, of no use whatever except as a semi-legal document forming part of the contract.



All facts and experiences are transmitted in the same way, so that in the course of time we get them very much spoiled by repetition, the results of copies of copies. The original features and types of architecture have by this sort of transmission become hereditary in certain countries, and have also lost their original meaning.

The customs of building and of the trades connected with it have very much influenced architects—not always for the best. The local Mr. Smith is full of provincialisms in his work: his buildings are, indeed, convenient and stable; but still, for all that, he adheres to some particular plan and mannerism, which distinguish them as his own. The manner and style of the doors and windows, roofs and chimneys, even the design of his gables and mouldings, are unmistakably Smithlike. But custom has a great deal to answer for in the use of materials. In localities which produce brick, and far away from quarries, stone is employed in positions and ways which the practical stone builder would not tolerate. Thus, we find limestone buildings in manufacturing towns saturated with smoke, like Birmingham, where the stone cannot last long. The stone builder would take care to use certain beds for resisting smoky atmosphere; but we now find the Bath oolite used for every sort of edifice, irrespective of the atmospheric conditions. The old builders of churches in the West of England employed the stone from quarries situated along the Somersetshire hills. The modern specification-writer specifies the same stone in Bristol, Birmingham, and London, exposed to a smoke-laden atmosphere, where the stone exfoliates in a short time, as it has done at the church of St. Mary Redcliffe, Bristol. He does what others have done before him, but without their special knowledge. So it is that custom repeats modes of building that are unsuitable to a given locality; we see modes of working and using the material found in one stone district repeated hundreds of miles away—as far, at least, as appearance goes. An architect continues to write such a clause as this: "The fronts to be built with the best Bath stone [quarry named], to be laid on its natural bed, and to be cleaned off when set"; or the "fronts to be faced with Portland stone ashlar in courses, to bond in with the courses of brickwork, the stretchers to be 4½ in. deep and the headers 9 in. deep, with bond stones running through the whole thickness of wall, &c." What the term "best" implies is not clear, and has no meaning to the practical quarryman—whether it means to apply to durability or freedom from shakes and vents, or colour, or what not. There are stones in every quarry which may be considered superior in one way or another, and it does not follow that a quarry produces a "best" of equal merit in all points. If the term means a combination of qualities, evenness of texture, freedom from defects, &c., it will be very difficult to find one mason or quarryman agree with another as to which is the *best*. Again, the requirement of "natural bed" is a condition which very few builders or architects observe, even if they are able to determine the proper bed. Thus, a sandstone is laminated in structure, with its plates of mica in planes parallel to its quarry bed. Of course, these should be placed in their natural position, or horizontally, in the building, for if they are vertically placed the stone will soon begin to flake off at the surface, and the same precaution is necessary with the shelly limestones, as in the oolites. It would be more reasonable to require the stones to be so quarried and marked as to insure the laminated planes being laid in their horizontal positions. In ashlar fronts it is almost impossible to observe the rule, as the stones are often easier cut in the direction of the plates or laminae than across them. Here we have an

example of an injunction that it is easier to give or write than to follow. The old stoneworker and builder knew what to do to insure the durability of his stonework without strictly following the natural bedding of the stones: he could select his stones to suit his purpose from those beds he thought best, and place them in positions on the building which would expose them least to the weather or moisture. Hence it is so many of our oldest churches and cathedrals have weathered the elements for centuries in the stone districts of the North and West. This natural instinct of how to select and bed the stones of a particular quarry gradually became lost when the quarry and the mason were more and more dissociated and when the modern "contractor" appeared. It became then a mere tradition, and passed into the "lingo" of the specification till its original meaning was whittled away to the language of a mere business document.

The same transmission from actual fact and practical experience to the conventional specification description may be observed in the trade of slating, and the fact has been noticed by Mr. W. E. Beck in a paper on "Slating of Roofs," lately read before the members of the Northern Architectural Association at Newcastle-on-Tyne. The shortcomings of the ordinary specification for a slated roof are well pointed out by Mr. Beck. He says that specifications show but little improvement in this trade over those of twenty or more years ago; they are ambiguous, misleading, and stereotyped. He finds one fact in his experience: the great similarity which runs through the specifications for slaters' work, no matter for what class of work. We do not doubt the fact when we remember how these documents are prepared, and by whom. One point noticed is how little attention is given to discovering the most suitable slate for the particular building. How little, indeed, when one architect will repeat the same formula and provide the same size and quality of slate for cottage and mansion. The author of the paper says:—"If we take any fifty specifications from the North of England offices we shall find forty-eight of the same requiring 16 in. or 18 in. by 10 in. slates and of Bangor quality, while further south you will find 20 in. by 10 in. and larger sizes predominating, and of varying qualities." These sizes cannot always be obtained; there is the difficulty of securing any particular size in large quantities, and then the architect ought to consider mainly the pitch of his roof, the length of rafters, &c., before specifying the size of slate. Thus for a square pitch a 12 in. by 6 in. slate or larger would be safe, and the lap could be less. Now, these technical points and difficulties are not considered by the ordinary specification writer: he simply adopts the old formula or phrase he has been used to, so little attention is given to discovering the most suitable quality or size, or readily obtainable slate. The author to whom we refer advocates that all or any sizes are equally effective for keeping out the wet, and he favours a more general adoption of Westmoreland slates which are of various sizes. So, too, the stereotyped phrases of the *Quarrier*. What is meant by the terms "best," "seconds," "thirds," "mixed," and other terms used by timber merchants in describing deals? There is a lack of knowledge on this question of marks or brands. They are used, but not understood. In regard to slates, the term "best" or "seconds" may mean, as we have hinted, many things or qualities which, if not defined, may lead astray. It may mean a thick or thin slate; a certain shape or kind; and in a similar way the particular description of timber specified may be, after all, wrong for the particular purpose for which it is required. A phrase such as the timber to be from Memel or Riga is very well if every deal and back can be thoroughly inspected.

Or it may be required that the timber is to be got out of balk timber, when ready-sawn scantlings would be more likely to be seasoned, as the imported sizes of deals and battens are better adapted for many purposes, and are superior to balk-cut timber. A practical writer on this subject has said, to properly specify the timber of a building a knowledge of the wood market is necessary—very rare with architects. In joinery, ironwork, plastering, and other trades we may discover a similar use of phrases which indicate a degeneration from the original requirements; but it is needless to say more. We all know how much is practically left to the good sense of the workman and the integrity of the builder. No doubt much could be done to retrieve the architect's position were he to take the trouble to make himself more familiar with the materials and methods of building, to visit quarries, workshops, and laboratories, to study provincial methods of stone and slate-laying, and to frame his specifications from what he has observed of the practices of the different trades. Only in such a way can he make his specification a practical instruction to the builder, and redeem it from those ambiguities which tend to discount his knowledge very much in the eyes of the practical man.

#### THE SOANE AND INSTITUTE PRIZE DRAWINGS.

THE designs submitted for the Soane Medallion and one hundred pounds for Continental travel on view at the Institute number 14 sets. The subject proposed was a provincial market hall to cover an area not exceeding 4,000 sq. ft. detached on all sides. One of the ablest designs, "Shell and Ribbon" device, very simply disposes of the market hall or ground-floor plan. It is a rectangle open on both sides each by three circular arches, with one wide entrance at the end. Arranged at each corner internally are staircases to the hall over, and at the rear end for fuel, keeper, and entrances for performers. The design shows a high-hipped roof, open-timbered in a simple and effective manner internally. The centre timber *flèche* or octagon lantern carried up from a square structure is quaint and picturesque, and the front is relieved by three ornamental gables of Flemish character. "Labor ipse Voluptas" (the author of which, Mr. J. A. Swan, receives medal of merit), is also ably treated in red brick and stone in a Late Gothic style, with high roof and *flèche*. The market standings form a vaulted story, supported on pillars, with corn exchange at one end. The assembly-hall, over 81 ft. by 34 ft., has a platform at one end, and is approached by a projecting staircase which makes a pleasing break in the flank elevation. The offices are at the end. There is an open-timbered roof over the assembly-hall, and the details are drawn with skill. Severity of outline and breadth distinguish another artistic design, which takes the quaint motto "L'Éléphant d'Argent." The plan is clever, but not so simple or economical as the preceding, and the corridor round the platform of assembly-hall is wasteful. A bold flight of steps externally gives access to the hall above through an archway enriched by sculptured figures, forming a part of a massive tower which terminates in an octagonal parapet of dressed stone. The market below is arcaded on all sides, with deep buttresses which go up to the upper windows of assembly-hall. The sculptured figure frieze over arcades and the details show masterly freedom and skilful drawing. The author, C. H. Holden, Bolton, receives hon. mention. "Russet" (J. A. R. Inglis), who wins the Soane Medallion, is in a rusticated Roman or Italian style, drawn with know-



ledge of Classic details. The upper story is relieved by engaged columns of the Ionic order, with circular-headed pedimented windows between. The main front is broken by two projecting portions. Details are cleverly drawn. "St. Clements" is a kind of hybrid English Renaissance, with flat, small-paned oriel windows to public hall and a ridiculously small turret or ventilator in high roof with octagonal turrets at angles corbelled out: it is quaint and firmly drawn. The market space underneath has only two side entrances. "Bon Espoir" is a half-timbered structure in its upper part, stone below, with a projecting tower at one corner for stairs to hall, &c. Other designs are as follows:—"Neath Southern Skies," a very elaborate and bizarre mixture of Gothick features; "Oxonian," of a Renaissance type with mullioned windows above, and an elaborate lantern on roof terminals over pilasters, and a cramped oriel at end; "Charley's Aunt," quaint and broad; "Artifex," poor and pretentious; "Li-Lu," an ambitious Gothic design of coarse details, with heavy octagon tower; "North Wind," Gothick but inappropriate.

For the Tite prize only two designs have been sent, and these are unrewarded. The subject chosen was a design for an Italian Villa and Ornamental Garden to cover two acres. We cannot say much for either of the designs sent, and they are unworthy of the problem. Of the two "Gondola" is the better. The villa is a square, with centre hall and lantern over, a portico facing the main vista. A fountain and bridge are features. The perspective scarcely does justice. "Circle" is an ambitious Classic villa with Italian garden. Both have failed to give us anything dignified or picturesque. Seven designs have been sent in for the Grissell Gold Medal. The subject set was a good one: the "Bay of a Church, 65ft. wide internally; the nave and aisle vaulted in stone throughout." Very different treatments are seen. "Equilibrium" is clever as an experimental design. The arches and vaults are based on the catenary curve with "the object of keeping the 'centre of pressure' in centre of their thickness, and of avoiding all thrust except at springing"—excellent in theory, but scarcely suitable to Gothic design. The author gives a diagram of the stress lines, which shows the resultant forces quite vertical through the piers, and the details are ably drawn in a Late Gothic style. "Heart and Shield" (S. K. Green-slade) takes the medal for a pencil set, showing a masterly hand in the breadth and treatment of detail. The plan has recessed vaulted bays between deep buttresses. "Phoen," "Goth," "Zeal," "Middle Ages," "E. F." are other attempts.

The Pugin Studentship and £40 prize is fairly won by W. Haywood, of Birmingham, for pencil drawings of St. Patrick, Patring-ton, Yorkshire, and drawing and details of the elaborate Renaissance pulpit in St. Chad's, Birmingham. James A. Swan sends six strainers of drawings and details. Those of Notre Dame, Bruges, Hotel de Ville, Brussels, and the large carefully-measured coloured drawing of the Meat Market, Ypres, and the Cloth Hall, of the same city, may be mentioned, also the "Skipper's" House, Ghent. C. de Gruchy's series of nice pencil drawings of St. Mary, Beverley, include the fine western towers and transept. These drawings and sketches of details exhibit knowledge and feeling. Both sets obtain medals of merit. Walter E. Dobson sends drawing of St. Mary, Stamford; shrine of Etheldreda, Ely; and sketches from Beverley and Lincoln. The coloured drawings sent in for the Owen Jones Studentship are not strong—only two are hung. Arthur T. Griffith, who takes the Aldwinckle prize, sends details of colour decoration from Hereford Cathedral; screen on the Lady

Chapel at Tewkesbury Abbey, sedilia, and some Venetian sketches; and A. E. Henderson sketches of Monreale Cathedral, studies in S.K.M., for which the Studentship is given. The drawings of the coloured decoration of the Romanesque church of St. Savin, Poitiers, arcade and vault, are interesting. A full list of the prize-winners is given on another page.

## "BUILDING NEWS" DESIGNING CLUB. A VILLAGE CHURCH.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THE competitors for this subject have well maintained their credit, and in general terms the style of work submitted is very good, though several of the drawings are not so effectively executed as could be desired. "S. Leonard" is placed first, "Pickles" second, and "Nut" third. The instructions issued to contributors were as follows:—B. A village church, with a central tower, north and south aisles, and shallow transepts. The design to be adapted to a stone district, and the roofs are to be covered with tiles. The tower may be surmounted by a simple broached spire. Benches are to be shown to seat 250 people in the church, and choir-stalls in the chancel to seat ten men and twelve boys, besides two priests' stalls. The altar-pace is to be seven steps, or 3ft. 6in. above the nave floor. A pulpit is to be shown, and a simple screen in oak on a dwarf stone wall dividing the chancel from the nave. An organ-chamber is to be provided on north side of chancel, and a way for the return of communicants on the south side is to be provided. The font is to be located at the west end of the church, and a good porch on the south side is wanted. The vestry is to be divided into two—one room for the clergy, and one for the choir—and a separate entrance door opening into a lobby is to be provided from the south side of the building. The site stands above the road 6ft., so that a feature may be made of steps leading up to the entrance; but the surface of the ground round the church, forming a small churchyard, is practically level. Attention to church requirements in a village is to be considered and provided for, and the tower must be adopted for housing five bells, with a ringers' chamber. Simplicity of design is suggested; but the style and size of the building are left to competitors, who must let the accommodation asked for govern the space to be provided. The central aisle must be 6ft. wide. The building is to be set back about 25ft. from the road, where a frontage retaining wall stands on account of the elevated site. Scale, 8ft. for the two elevations and sections required, and plan may be drawn to 16ft. to the inch. A view is necessary.

The design awarded the post of honour is rather more monumental than we intended, and the traceried windows to the aisles increase their height and add to the cost of the building, rendering its erection little likely in these days, when churches are built on the principle of so much per sitting, instead of the old method of keeping in view the object to which the church is to be devoted. We have considered the problem with these considerations in mind, and have not overlooked the efforts of those competitors who have endeavoured to produce designs in a cheaper, and, to some extent, successfully suitable manner. The purpose of our club is to assist student readers to design architecturally in a commonsense and practical way, not ignoring tradition, and not avoiding modern requirements. We do not say that "S. Leonard" has entirely accomplished these conditions, but he is evidently working in that direction. He has quite overlooked the opportunity which the site afforded in the way of a flight of steps at the entrance to the churchyard, and the sloping ground suggested by his very poor perspective is not in accordance with our statement in the conditions. His iron entrance gateway is out of character, and seems wrongly located. The south chapel would have been improved by an archway almost as wide as the aisle, and a doorway by the side of the altar is not a happy arrangement, as the priest saying the office in front of the altar is likely to be disturbed at any moment by the opening of the door from the vestry. If he assume the north end, the effect would be even worse. In other respects the plan is fairly good, though the provision of a w.c. is an open question, and to our mind is quite unnecessary.

"Pickles" gives us a spire, but there is a want of dignity and a thinness evident in his design which rather spoils it. He does not attempt a morning chapel, and he boxes in his organ objectionably. His perspective does not agree with his plan, and so an alternative arrangement is introduced, which, to some extent, is an improvement, so far as the two vestries are concerned. "Nut" has many merits, and his drawing would have made an effective illustration, but he sends no view. The wide, short, sprawling nave is out of harmony with the narrow and pinched-up chancel, over which the tower extends. Little regard is paid to the worshippers in the transepts, who are shut off entirely from the sanctuary. The best part of the design is the sturdy tower, which is not improved by the long, low window, in the ringing stage. The double transept in the elevation is not justified by the plan, and there is no section. The little bay for the baptistery is ugly and paltry. "The Dingo" breaks away from preconceived notions of church design, which we do not in the least object to; but the Nonconformist, to justify his position, must demonstrate that his departure produces, at all events, a worthy substitute. This "The Dingo" fails to establish, for his sprawling acute segmental windows in the gable ends are neither graceful nor well proportioned, and the side windows, with their square heads, do not harmonise with the arched ones, or contrast well with them. The drawings are bold and striking, showing that the author is a capable contributor, but he has yet to learn proportion, and to realise his design as a whole. The interior of this building would be most unsatisfactory. "Cheese" is the motto, and "just the cheese" seems to express the character of the next design. It is so smug and proper, reflecting the polished finish of a well-to-do suburb. The author must not think we treat him too lightly, or that we have overlooked his care and industry; but we should like to ruffle him out of his correctness if we could do so without wounding his *amour propre*. He has spared no pains to carry out the conditions, but the result is lacking in spirit. "The Cheese" will improve in time if we mistake not. "The Wolf," more stern, seeks inspiration from the Early English, and really his design would look very well grouped within the Sussex Downs. His plan is quite common-place, however, displaying no concern for modern church requirements. The two box-like vestries are childish in their limited capacity. "Side Light" is working in a good school, and sends a design distinguished by skill, method, and freshness. The west front and chancel-arch exhibit these qualities; but his plan is not so good, and his perspective is so unfairly drawn that we have felt it necessary to take away several marks from the "Side Light" for this reason. He makes his building look in the view twice as long as the geometrical drawings warrant. "Nap" draws well, but is too inky in the get-up of his sheet. We like the breadth of his central tower very much, but buttresses extending through windows are not very pleasing. Mr. Butterfield did this at St. Matthias Church, Stoke Newington, and the late J. D. Sedding developed the fancy which some of his imitators have repeated, but it is time the trick made way to a more worthy one. Arches should not need props of this kind. "Nap's" perspective is handled broadly, and we shall expect him to do something to justify our anticipations of his capability. "Moss" is not wanting in dignity, but there is no need to sacrifice grace and ignore good proportion. His design is strong, and would look well on a rocky shore, where stern necessity excludes all but elementary forms. Ladies' cloak-rooms and w.c.'s, however necessary in their way, are not essentials in church architecture. His tower in the view looks a trifle too much as if it belonged to the water-works. "Pickwick" crushes his central tower by an extinguisher of a spire, but his design would suit a village churchyard. It is freely drawn, and the Flamboyant traceried to the gable windows would seem fairly appropriate, but the best part of his work consists in his free style of draughtsmanship. His section is bald, and his plan is crude. "B. S. A." draws less broadly, in a style which some think "fetching," by working up minutely some parts and leaving others in bare outline. His design is of the patchwork order—"American or nothing." He is clever, and tries to be original, but has little knowledge of church requirements or the fitness of ecclesiastical considerations in a building intended for worship. "Gilbert" makes a thin



looking plan, devoid of proportion, fit in with an old Southdown-charactered church exterior; but his detail defies investigation. "Baron" works out an original design with care, and shows a lofty nave arcade. The shelter built into the south aisle would be a nuisance. There are some good points, however, in his plan. No view is sent. "Pantile" deserves more than a bare mention, because he draws broadly, but he designs indifferently. The ungainly, wide, segmental, and traceried windows under the gables are ugly. The screen and pulpit suggest ideas, but the organ recess-arch is ugly enough to ruin any designer's reputation. "Pantile" really must not do such things. "Scotland" is the motto of a clever fellow, but his ability runs riot, while he overlooks elementary principles. For instance, springing the chancel arch off the respond caps in this way is horrible, and the inner order of the arcade arches should oversail the vertical lines of the piers, as in all good Gothic work. His church plan is excessively poor. "Tyke" has a boldly-conceived central tower, and we wish we could enumerate some more of the many worthy designs; but the contributions are too numerous for this, so we must content ourselves by grouping them in order of merit. "Agon"; "Enlisto"; "Novcastrian"; "Don Juan"; "Ard"; "Norton"; "Percy"; "Geisha"; "Ashton"; "Nil Desperando"; "Hikiki"; "E. G."; "Zulu"; "Aikane"; "Cyclist"; "Forfar"; "Mostyn"; "Pebble"; "Q. E. D."; "Whitefriar"; "Leemo"; "P" in a circle; "Ashleigh"; "Gnat"; "Rock"; "Don't Know"; "Cameo"; "Heaves," and "Smiler."

#### GRAPHIC STATICS.—VII.

FIG. 23 (a) is the frame diagram of a common form of iron roof-truss; this form is called the *trussed rafter roof*. Suppose the roof to be loaded with a weight of 4 tons uniformly distributed along the rafters. This load, being referred to the joints of the truss in the usual way, gives for the external forces A B, B C, C D, D E, E F, the amounts figured for them respectively in the diagram. Let there be additional loads of  $\frac{1}{2}$  ton each, supported at the two lower joints, as shown in the figure; then the total load is  $4\frac{1}{2}$  tons; and, assuming the supporting resistance to be vertical, we shall have F G, K A, each vertical and equal to  $2\frac{1}{2}$  tons.

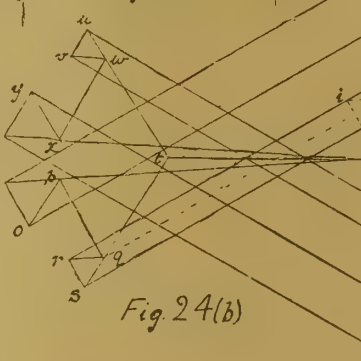
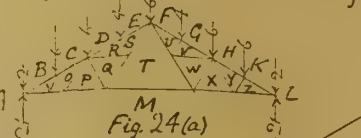
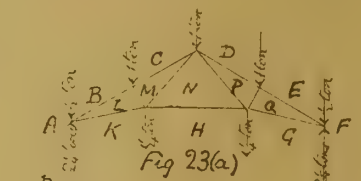
To draw the force diagram, Fig. 23 (b). Here  $ab$  ( $\frac{1}{2}$  ton),  $bc$  (1 ton),  $cd$  (1 ton),  $de$  (1 ton),  $ef$  ( $\frac{1}{2}$  ton) are first set off, in order, to represent the given loads A B, B C, C D, D E, E F respectively;  $fg$  ( $2\frac{1}{2}$  tons) is then taken to represent the resistance F G, and next  $gh$  ( $\frac{1}{2}$  ton),  $hk$  ( $\frac{1}{2}$  ton) are taken to represent the two lower loads G H, H K respectively, thus leaving lastly  $ka$  ( $2\frac{1}{2}$  tons) to represent the resistance K A, so getting the complete polygon  $abcde fghka$  of the external force acting on the frame, and keeping it in equilibrium as a whole. Observe that, if we take the same cyclic direction in going round the frame, we shall obtain the same force polygon, whichever force we begin with in drawing the polygon of the external forces.

The internal forces may now be found. Beginning at the left-hand point of support, we have the known forces K A, A B; draw, then, in Fig. 23 (b)  $bl$  parallel to B L, and  $lk$  parallel to L K; so we obtain the polygon  $kablk$  for that of the forces acting at this point. At the point L B C M L there are now only two forces unknown. The polygon  $lbcm$  may, therefore, be completed by drawing  $cm$  parallel to C M, and  $ml$  parallel to M L. Next complete the polygon  $klmnhk$  for the joint K L M N H K by drawing  $mn$  parallel to M N, and  $nh$  parallel to N H. The frame being symmetrical, and the external forces symmetrically arranged about the frame, there is no absolute need to draw the other half of the force diagram, since the force in any member on one side of the frame will be equal to that in the corresponding member on the other side of the frame. The student is, however, advised to draw the complete diagram, both as being a valuable exercise and an important means of testing the accuracy of the work done. The other half of the diagram may be drawn by going on now to draw the polygon  $nmc d p n$  for the apex of the frame, following on with the polygons  $pde q p$ ,  $hnp q h$ ; the remaining polygon  $q c e f g$  will at the same time have been drawn. Or we may begin again at the right-hand point of support, and follow on as was done for

the first half of the diagram. For the work to be accurate the polygons for all the joints must properly close, and the beginner is reminded that any line in the force diagram must be parallel to the line which is similarly lettered in the frame diagram.

Fig. 24 (a) shows a *trussed rafter roof* with three struts (to the rafter). There is a special interest attaching to this frame on account of the difficulty of finding the internal forces which act at the middle point of each rafter. An eminent writer on this subject has stated that the forces in the members which meet at these points are indeterminate; but a careful examination of the method of solution now to be given should suffice to satisfy the reader that that statement is a mistake.

Suppose the loading to be as figured in hundred-weights in the frame diagram, Fig. 24 (a); draw, as directed in the preceding cases, to some convenient scale, the force polygon  $abcde fghklmna$



of the external forces. The polygons  $mabnm$ ,  $nbc on$ ,  $mno pm$  may now be drawn; and, similarly, on the right-hand side of the frame, the polygons  $klmzk$ ,  $hkzyh$ ,  $yzmxy$  may be drawn. It will now be seen that at every one of the remaining joints of the frame there are more than two things unknown with respect to the forces which act at these points, and that, therefore, the force polygons for these joints cannot be drawn until more is known. At the joint P O C D R Q P, the forces acting in the members P O, O C have been found, and the force C D is given; there remain to be found the forces which act in the members D R, R Q, Q P. These cannot be found by drawing the force polygon for the joint; but if any one of them can be found independently there will remain only two things unknown as to the forces at that point, and the force polygon can then be drawn, and so the other two found. Going on to the next joint D E S R D up the rafter, we see that, although the three forces which act in the members E S, S R, R D are unknown, the force in S R may be immediately found, since the other two unknown forces act along the same straight line, and, therefore, have a resultant which acts along that same straight line. This resultant and the force in S R will evidently be in equilibrium

with the given external force D E, and may, therefore, be found by the triangle of forces. Thus  $ei$ , Fig. 24 (b), drawn parallel to S R, and  $id$  drawn parallel to the resultant, that is, to the rafter, determines  $ei$  as the force in the strut S R, and  $id$  as the resultant of the forces in the two members S D, E S of the rafter.\*

At the point R S T Q R we may now, by similar reasoning, find the pull in the bar Q R, since the bars S T and T Q are in the same straight line. Draw  $ej$  parallel to the direction of these bars, and, therefore, to the direction of the resultant of the forces which act in them; draw  $ji$  parallel to Q R; then  $ej$  is the said resultant, and  $ji$  is the pull in the member Q R, thus giving  $ij$  as the pull in the same member (R Q) at its other end. There are now only the forces in D R and Q P unknown for the joint P O C D R Q P, and the force polygon  $pocdrqp$  for that joint may, therefore, be drawn as follows:—Draw  $pq$  parallel to P Q to meet  $jq$  parallel to the rafter, so finding the point  $q$  of the required polygon; then  $qr$  parallel to Q R, and  $dr$  parallel to D R will complete the polygon, thus finding the forces in Q P and D R. To make the matter quite clear it should be observed that the figure  $grij$  is a parallelogram by construction, and that therefore  $gr$  is equal to  $ji$  as required. Those lines,  $ei$ ,  $ij$ ,  $je$ ,  $gri$  in Fig. 24 (b), which do not belong to the force diagram are shown in broken lines.

The force diagram may now be finished in various ways. We may, for instance, complete the polygons  $mpqtm$ ,  $tgrst$ ,  $tseft$ ,  $ufquv$ ,  $tuwvt$ ,  $wghyxyw$  in the order in which they are named, and if the work is correct it will be found that the polygon  $mtwzm$  has at the same time been properly drawn, and so the force polygon for every joint completely found, and the forces in all the members determined.

The beginner is warned that he must be very careful in any attempt to deal with a joint by itself. He is reminded that no more than two things must be unknown with respect to the forces which act at any point before the force polygon for that point can be drawn.

It should be noticed that the reasoning employed in dealing with the special difficulties of this truss will apply even when the truss or its loading is unsymmetrical, and also when both are unsymmetrical. The essential condition is that two of the unknown forces in each case act along the same straight line. This example is well worthy of the bestowal of the time necessary for its complete mastery.

In Fig. 25 (a) is shown a braced cantilever, supposed to be fixed at one end to some supporting structure by means of eye-and-pin joints, and loaded at its free end with a given load, A B. As to the other external forces, the direction of B C is known, since it must be in the same straight line with the member C B of the cantilever, in order to balance the force in that member; and the direction of the third force, therefore, becomes known, because the frame, being in equilibrium under the action of three non-parallel forces, the lines of action of the forces must meet at a point. The polygon of the external forces may now be found by drawing  $ab$  equal and parallel to the given force A B, and  $bc$ ,  $ca$ , parallel respectively to B C, C A; but there is no absolute need to draw the entire polygon of the external forces in order merely to find the internal forces, although it is decidedly advisable to do so, at any rate until the student has become familiar enough with the subject to intelligently and, therefore, safely, omit what is not actually required to be used.

To find the internal forces we may begin at which end we like of the frame. Beginning at the free end, the polygons may be drawn in the order  $abda$ ,  $adea$ ,  $edbf$ ,  $efga$ ,  $gfbhg$ ,  $aghka$ ,  $khbck$ ,  $akca$ . Instead of this, we may begin at the fixed end, and take the joints in exactly the reverse order, or we may work part way from one end and part way from the other.

Consider next the cantilever shown in Fig. 26a, and suppose it to be loaded along its top with a load of, say, 6 tons, distributed uniformly. Referring the given load to the joints of the truss, we get the loads A B (1 ton), B C (2 tons), C D (2 tons), D E (1 ton). These loads will evidently be arranged symmetrically about their resultant, which, therefore, acts in the position shown by the vertical dotted line. This resultant is known also from the fact that it must represent the given load, and must, therefore, act through the centre

\* In other words,  $id$  is found to be the amount by which the force in S D exceeds the force in E S.



of gravity of that load. Of the other two external forces, we know that the direction of FA must be the same as that of the member AF of the truss, since it must balance the force in that member, and if we replace the external forces AB, BC, CD, DE by their resultant, we may say that the frame is kept at rest by the action of three non-parallel forces, whose lines of action must, therefore, meet at a point. Hence the direction of the external force EF is known, and we are enabled to draw the polygon *abcdefa* of the external forces. The force polygons for the various joints may now be drawn in the order *abga*, *agha*, *hgbe*, *eh*, *ahkl*, *lked*, *edmf*, *fmdf*. The reverse order may instead be taken, or the order otherwise varied.

It is worthy of note that the addition of a vertical member at the fixed end of either of these cantilevers would have introduced an element of uncertainty with respect to the directions of the supporting forces, and, therefore, also with respect to some of the internal forces.

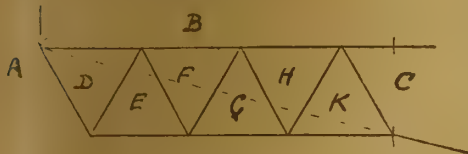


Fig. 25(a)

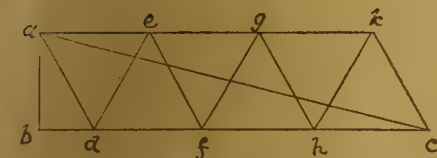


Fig. 25(b)

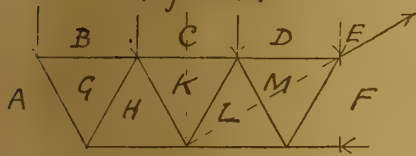


Fig. 26(a)

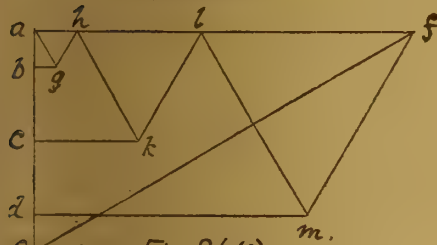


Fig. 26(b)

The subject of the drawing of force diagrams will now be dropped for a time, while we improve our equipment for dealing with these and other problems.

NOTE.—Fig. 22 (b) came out imperfectly; the lines *dl*, *ek* should be drawn in by the reader.  
J. C. PALMER.

#### ADAPTABLE SPECIFICATIONS.—XXVI.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued).

**WALLER AND MASON.**—We have been supposing, so far, that the building to be superintended is mainly of brick. It may, however, have brick walls faced with rubble, or faced or lined with ashlar: it may have walls entirely of rubble, or rubble walls with a brick or ashlar lining or facing. And whether the walls are of brick or rubble, they may possibly contain a considerable amount of masonry in the way of "dressings." Where the walls are wholly or chiefly of rubble, it is important to see that the footings are made with large flat bedded stones, reaching right under the central part of the wall, on which the chief weight is likely to come. Works in rubble depend, even more than those in brick, on the skill and care of the workmen, and a care-

lessly bonded rubble wall is amongst the most treacherous productions of the bad builder. The careless waller is satisfied with running up the inner and outer faces of his work with some regard to appearance. The core of the wall he fills in with small stones and rubbish, and trusts to the mortar to bind the whole together. The result is that the core settles more than the facings, and that the latter crack and bulge. Too much care cannot be exercised in seeing that the whole thickness is built of stones of about the same average size, the small fragments being only used here and there to fill in the cavities which unavoidably occur between one stone and another. Plenty of "through stones" and bonders should be used. The rubble must be set, like stonework in general, on its "quarry bed," but, at the same time, so that its flatter faces are at top and at bottom. With thin flat bedded rubble it is perfectly easy to fulfil all these conditions: easier, in fact, than it is to transgress them. With other kinds, which break into irregular shapes, like those of Kentish rag and Malvern Hill stone, it is much more difficult. Every foot of the work then presents its own problems, and it needs both care and cleverness on the workman's part to solve them effectually. Where he only uses these qualities in appearing to solve them, he may make his "through-stones" go as far as the deceptive bricklayer does his headers: snapping them so that the wall seems, on the surface, to be well bonded, though the apparent bonders only extend, perhaps, a few inches into it. Walls of Kentish rag are sometimes strengthened, at every yard or so of their height, by a double course of plain tiles in cement, going through their whole thickness. The effect is not displeasing, and recalls that of the thin bricks with which the Romans strengthened, at intervals, their own rough masonry.

Rubble walling needs specially excellent mortar, for when the stones are very uneven, it is on the mortar that its main strength depends. Really good hydraulic lime, ground up in a mortar-mill with sand, or, where the colour is not objectionable, with sandy red brickbats, will make good work and set quickly. The last point is important where heavy weights are coming on the walls within a few months, or perhaps even a few weeks, after they are erected. Portland cement, with three or four parts of sand, will answer equally well, though at greater cost. This must be mixed by hand, and not ground up in a mill, and the cement should be very slow-setting, to lessen the risk of its being "knocked up again" after it has begun to solidify. Where the rubble comes from a quarry in the neighbourhood of a building, it generally proves to be damp enough for building purposes; but when too dry, it should be well sprinkled all over, especially if it is to be set in cement.

Where rubble is lined with brickwork, which is sometimes done to keep the interior of a building dry, as many brick-headers as possible must tail into the walling. Tile courses, bonding still farther back, may also be used, and likewise hoop-iron in cement; but, of course, the through-stones in the rubble must not come through the brick lining. If the brick lining is only 4½ in. thick in the stretcher courses, it will hardly be strong enough where roof trusses or girders come on it, and at these points it may be well to increase it to 9 in., 14 in., or sometimes even 18 in. Where brickwork is faced with rubble, on the other hand, frequent bonders or through-stones should be carried back from the face of the rubble to within 4½ in. of the internal surface of the wall. In every case the brickwork should be well bonded and fitted right up to them, and on to them; a bonder with no weight on its hinder end scarcely acts as a bonder at all. These compound walls should be well grouted every foot in height or oftener, with grout made as thick as practicable, and this should be worked into the joints with a piece of stout hoop-iron, or some similar tool. Good brickwork, by itself, ought not to need grouting; but rubble, and mixtures of rubble and brickwork, necessarily contain so many irregular cavities that they can hardly be at their best without it.

Ashlar facing is used both with brick and with rubble walls. To make really good work of it, no ashlar stone should have a smaller area on bed than it has on face. A great quantity of cheap ashlar, however, is done, in which the courses are a foot high, or perhaps more, and only from 3 in. or 4 in. to 6 in. thick. Such stuff is advertised at a cheap rate by various quarry owners, and usually cracks and bulges freely after a few years,

where any considerable strains come upon it. The softer the stone is and the deeper the courses are, the more this happens, so that thin Bath ashlar, for instance, stands the test of time worse than thin Ancaster. Whether the walling to which an ashlar facing is attached is of brick or rubble, it is most important that its courses should finish level with those of the ashlar. The latter, where they are to bond with brickwork, will therefore be in height some multiple of a brick thickness, as 6 in., 9 in., or 12 in., and where they bond with rubble, the rubble must suit itself to the heights of the masonry courses. As the ashlar beds will be closely fitted together, those of the backing, whether it is of brick or rubble, should not have more mortar in them than is really necessary, and even then, being more numerous than those of the squared stones, they are sure to settle more, and so to shirk their proper share in carrying the superstructure. In any case, the ashlar should have a good number of bonders, going through, or nearly through, the wall; and bond-courses of hoop-iron in cement at convenient intervals will help to tie the rather unsatisfactory composition together. The need for setting all the ashlar stones on their quarry bed must not be forgotten, or in addition to the danger of cracking, there will be the practical certainty of decay.

Different kinds of rubble differ greatly in strength. Yorkshire parpoint well built and well bonded, is stronger than brick, and depends but little on the mortar. Kentish rag walls, on the contrary, could hardly be put together without mortar, and even with it they are comparatively weak. There are all sorts of rubble intermediate in quality between these, and the architect who means his work to last, will select, where he can, a flat, tough, thin-bedded stone for his walls, in preference to an irregular or rounded one. If the last is forced on him by local reasons, he will make up for the weakness of his walling by increasing its thickness. We seldom see, in modern times, the 4 ft. or 5 ft. thicknesses which were common in the Middle Ages, and yet even the latter exhibit many failures. If we want to save materials, we can only do so with safety by improving the style of workmanship. Our rubble walls must be better bonded than the old ones—a thing which might easily be, but which seldom happens. Compound walls, such as brickwork with rubble facing, and brickwork or rubble with ashlar facing, are things to be used with caution, though tough, thin, flat-bedded rubble does not form an insecure front to a solid brick wall. In rubble walling, a good workman is everything. By care and determination on the architect's part inferior bricklayers may be induced to turn out passable brickwork; but inferior wallers can never be forced to produce good rubble. To build it properly needs ingenuity and skill, and a thoughtless, clumsy man cannot manage it. These are some of the inferences which may be drawn from a prolonged acquaintance with various modes of stone walling.

In *Superintending Masons' Work*, one of the first things to do is to find out the bed-way of the stone. In coarsely-laminated stones it is obvious enough. In others it may be worth the trouble of a visit to the quarries to ascertain it. For some stones, like clunch—if that tempting material for internal carving is hard enough to be honoured with the name of stone—the bed may be discovered by observing the position of certain dark specks, which are only noticeable when closely looked for. These are thin and flat, and the flat way of them is the bed-way of the stone—as if they had fallen into it when it was merely a semi-liquid sediment, and had settled down on their broadest faces, as bits of leaf might do. Some other stones, especially oolites, are traversed by crystalline veins, and the planes in which these veins run are at right angles, or nearly so, to the plane of the bed. In Ancaster stone layers or laminations of different shades may be traced, running parallel with the bed. The sections of these are, of course, visible on the upright faces of the blocks, or may be brought into view by brushing these over with water. They are not easily discernible, however, in the hardest and best white Ancaster, and when they are too plain they are apt to degenerate into clay beds, which are the chief defects of this otherwise excellent material.

If the stone is not worked at the building—as it is always desirable that it should be—the masonry will perhaps arrive there smeared over with a mixture of lime putty and water. This coating makes it impossible to distinguish the bed, or to

\* All rights reserved.



detect breakages and repairs, and if superintendence is to be anything but a farce, it should be at once removed. Where there is a desire to "scamp" the masonry, the fact of its being worked at a distance from the site very much facilitates the process. All sorts of soft and inferior stone can then be used, and as the architect does not see them till the mason has done his work, a contractor can pose as a very hardy-treated man, if they are rejected after all this labour has been put on them. He can do the same thing if he has picked out stones which are too short, so that they bond insufficiently into the wall, and these two savings, by using bad stones and short stones, will together put a considerable sum into his pocket. Masonry, again, which contains delicate detail, can hardly be sent far in trucks and waggons without an abundance of breakages. These are generally concealed from the architect, and patched up with shellac and stone-powder, or repaired by letting in little bits of stone. The face of the work is then carefully dusted over, and the injuries, possibly, are not discovered till after the contractor has received his final payment.

*Mistakes in the execution of the masonry* are doubly sure to happen when it is worked at a distance. The foreman perhaps sets out the stones wrongly, and when they arrive, tries to work them in somehow, that his error may not be discovered. If the masons are careless or half-trained, they may arrange their joints with feather-edges, when this happens, to save stone or labour, and then great efforts—though it is to be hoped fruitless ones—will be made to induce the architect to pass them as they are. All sorts of tricks, in short, can be played where the stonework is not prepared on the site, and all sorts of errors are likely to arise. When they do it generally happens that somebody on the works loses that particular detail drawing which shows them to be errors; and the loss of a "detail" will only make the experienced architect look the more closely into the work to which that "detail" referred.

*The omissions of cramps, dowels, joggles, and similar connections* is a fault which some foremen are very prone to. Even the rods which have been shown or specified to be built into a gable to hold together the finial or gable cross are sometimes left out, and the architect is then assured by the "practical man" that the work will be perfectly secure without them. The same kind of man usually tries to work these very finials in a number of short lengths, to save himself the trouble of ordering a deep-bedded stone, which would allow them to be made as shown in only one or two pieces. He has great faith in grouting, both in season and out of season. When he has been directed to set pierstones, carrying an enormous weight, on a solid bed of mortar, he has been known, instead, to form a margin of mortar, an inch or two wide, all round the edge of the lower stone, and to bed the upper one on this margin. Thus he has produced a cavity, from a  $\frac{1}{2}$  in. deep, between the two stones, and then, taking a great deal more trouble than it would have cost him to do the work properly, he has been detected in trying to fill this cavity with liquid grout. Probably the same man had often done the same thing elsewhere without detection. The ultimate effect of his labours would depend on the merest accidents. If the mortar margin happened to resist the action of the liquid, the upper stone would remain supported on the mortar after the grouting dried and shrank. Then, as the weight, say, of a heavy tower gradually came on it, the pierstone might break into pieces, or it might drop in a mass; and though it would only fall a small fraction of an inch, this would be enough to injure the arches above. No one knows how many of the settlements and failures in modern buildings, which are attributed to bad design or want of foresight, really arise from hidden trickery of this kind, and no important masonry structure ought to be carried out without the help of an honest and competent clerk of works.

Some of the Yorkshire stones, when fresh from the quarry, are very liable to be cracked by frost. They should, therefore, be protected during the first winter, especially while they are lying about before being worked or set. Great care should be taken that the beds of large stones are not worked hollow—a thing which sometimes happens through carelessness, but is also sometimes done on purpose, to make the masonry joints closer. The effect of this, where there is much weight to carry, is to flake off large pieces from

the face of the work. Stonework should be cleaned off bit by bit, directly it is set, and before it acquires a hard surface. If this surface is once removed by combing, scraping, or any other process, as is often done in the case of the softer limestones and oolites, the best protection which the stone can have is gone. It will never gain this weather-resisting face again, and the mason will have put the last touch to his work by destroying its only chance of durability.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday evening last the following awards were made:—The Institute Silver Medal and twenty-five guineas for an essay on "The True Value of Tradition and Precedent in Architectural Design." Five competitors submitted essays, but none were considered worthy of the medal, but a money prize of fifteen guineas was given to Mr. J. J. Cresswell, A.R.I.B.A., and a certificate of hon. mention to Mr. G. Cowan, A.R.I.B.A. The Institute Silver Medal and ten guineas for Measured Drawings of Ancient Buildings was won by Mr. F. J. Wass, of Melrose, for a capital set of drawings of Melrose Abbey. There were three competitors. For the Soane medallion and one hundred pounds for Continental travel, there were 14 designs for a Market Hall. That by Mr. J. A. R. Inglis, A.R.I.B.A., of Brondesbury, was awarded the prize, and Mr. James A. Swan, of Birmingham, obtained a medal of merit, while an award of hon. mention was obtained by Mr. C. H. Holden, of Bolton, Lancs. The Pugin Travelling Studentship (a silver medal and forty pounds for travel in the United Kingdom) was voted to Mr. William Haywood, of Birmingham. Medals of merit in the same contest were given to Mr. C. de Gruchy and Mr. James A. Swan. There were eight competitors. For the Godwin Bursary (a silver medal and forty pounds) only two competed, and Mr. R. Stephen Ayling, A.R.I.B.A., won the prize. Two entered the lists for the Owen-Jones Studentship (certificate and fifty pounds for the Study of Colour) was taken by Mr. Arthur T. Griffith, who obtained also the Aldwinckle Studentship. The Tite prize was not awarded, though there were two competitors, the subject being an Italian Villa. For the Grissell Gold Medal and ten guineas there were seven designs, the problem being a bay of a church. Mr. S. K. Greenslade, A.R.I.B.A., was awarded the medal.

#### "STAINED GLASS AS AN ART."\*

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

WHEN Mr. Henry Holiday first turned his attention to stained glass, it was, we believe, at the instance of the late William Burges, A.R.A., when that enthusiastic Mediævalist had in hand the decoration of the Renaissance chapel of Worcester College, Oxford, in 1863. The excellence of that work and the quaint figure carvings to its new stalls exhibit the thoroughness of Burges' skill; but the divergence of view as to the limitations and possibilities of stained glass which ultimately asserted itself between Mr. Holiday and Mr. Burges was scarcely approached in this Oxford undertaking, in which the two artists were thus successfully co-operating. Subsequently, however, some two years later, when the same architect commissioned the same painter to prepare the cartoons for a Gothic church, the architect wanted the figures delineated in Mediæval fashion, and thereat the painter struck, basing his objection on the artificiality of such a crude mode of drawing, and protesting against adopting the imitation of any style, and thereby violating the principles of the great artists of the Middle Ages, who all worked in their own style. From then till now, Mr. Holiday has continued with this ideal before him, and his book, to which we draw attention to-day, is for the main part devoted to an exposition of this view of the subject. The impression still, no doubt, lingers, particularly among the clergy, that stained glass should be rather Mediæval. It is a popular fancy without any exact limitations, and so occasionally we see 13th-century style decorations and glass inserted

in churches designed in accord with the periods of the 14th and Early 15th centuries. The amateur thus feels himself at sea in attempting to discriminate as to the merits of stained glass, which is often estimated mainly by its cost, quite apart from its art value, preference going very often to the loud, cheap, and nasty, always provided it be odd in drawing and garish in colour. The business standard thus governs the training of all who are engaged in the trade as a trade, and for the most part the merit of their work corresponds with the average of public taste. Mr. Holiday, having emancipated himself from limitations of this character, has endeavoured, in his volume before us, to explain the three governing and indispensable considerations necessary to an adequate appreciation of stained glass as a modern art. 1st. The technique and methods of using the material; 2nd, its artistic possibilities inherent in it; and 3rdly, its relation to the situation and purpose of the work. We do not propose to go through the author's essays in detail—it would be impossible in this brief review to do the several points justice, but we may note a few, by the way, leaving to the reader the obvious advantage of a personal acquaintance with the volume itself, in which there is much interesting matter on a variety of subjects only incidentally germane to the title of the book.

The ideal of success in stained glass is a jewelled splendour of colour, and its degree of success depends upon its realisation and development of this capacity for glorious colour, avoiding correspondingly all aim at pictorial realism. Except in the matter of composition and arrangement of colour, there is hardly a point in common between the beauties attainable in stained glass and those presented by nature and imitable in a picture. The draughtsmanship of the figures and their draperies in storied windows is of prime and overwhelming consequence, their parts being designed with due regard to the scale of the whole, as well as with reference to the "outlines" for the lead-work of the glass; but it is quite wrong to suppose that the metal cannot be cut to one shape as well as another, or that outlines cannot be drawn as freely on glass as on paper or canvas. Not only so, but light and shade can be given in any required degree of strength or tenderness, breadth or finish. It must be clear to anyone, therefore, that to intentionally imitate a Mediæval mannerism of figure drawing must be an unhealthy, gross, and ridiculous affectation, though, on the other hand, no good work in stained glass is possible which ignores the general principles dominating the designers in the Middle Ages in producing their masterpieces. Their draughtsmanship was necessarily archaic; but their figures are full of life, grace, and movement, their draperies emphasising the movement of the limbs instead of concealing them. These old designs often are consummate works of art—as, for example, the windows in the nave of Chartres Cathedral, which exhibit these qualities in a high degree. The work is full of vitality, which almost entirely depends upon form; indeed, many early windows contain little colour, and yet their effect is bright and jewel-like. The "Seven Sisters" windows in York Minster, in which there are no figures, consist of delicate grisaille with a very little admixture of colour, the effect being undoubtedly beautiful. The lode-star essential for the guidance of the stained-glass designer clearly is always the same: the distinctive character and beauty of the material, and the destination and purpose of the work. Transparency is its distinctive character, and the skill of the artist consists in enhancing this effect; and while accomplishing his scheme of decoration, he must never fail to subordinate his composition to the architectural forms which, as a handmaid, his work is called upon to adorn.

The neglect of this fundamental principle was one of the first marks of decadence in the Cinquecento period, at a time when it displayed gorgeous qualities of colour. In Classic or Italian-like buildings, with wide, simple openings, the stained-glass painter is met with few limitations; but, on the other hand, where the space to be filled is very large, it is essential to introduce stout iron stanchions and saddle-bars, not only for strength, but to furnish a basis for some leading lines in the design. Mr. Holiday has had exceptional opportunities of this kind in the American windows which he has so successfully executed, for instance, at the Theological College, New Jersey, or the Charity window for a church in Philadelphia.\* Other examples of his exquisite

\* Stained Glass as an Art. By HENRY HOLIDAY, with many Illustrations from Designs by Sir Edward Burne-Jones, W. B. Richmond, R.A., and the Author. London: Macmillan and Co., Limited. New York: The Macmillan Company. 1896.

\* Illustrated in the BUILDING NEWS, May 27, 1897.





FIG. 1.—THE MADONNA AND CHILD, EPIPHANY CHURCH, WASHINGTON.



FIG. 2.—AMERICAN CHURCH, GENEVA.

figure drawing are exemplified by the General Lee memorial window at St. Paul's Church, Richmond, Virginia, and in the "Jacob's Ladder" window of Christ Church, Brooklyn. Perspective in a composition like that of the "Charity" window is to some extent permissible; but the figures should at any rate be kept on one plane, avoiding all realism, which, when once admitted, imposes conditions of a natural scene, quite at variance with intelligent decoration intended to fill the space of a window. The old difficulty associated with the ever-recurring problem presented to the glass-painter, where one subject has to be carried through two or more lights, is dealt with by the author in a capable and reasonable way, while as a successful treatment of a series of subjects composed as a whole, in point of colour and design, Mr. Holiday's window in St. Margaret's, Westminster, in memory of Lord Fredk. Cavendish, exhibits how well its designer realises the principles he advocates.\* To-day we are enabled to publish a selection of the drawings from the volume before us; but the cartoons thus illustrated have been chosen as isolated instances of the author's figure work, viewed in contrast to the Mediaeval mannerisms emulated by others. The two outer groups represent the Liberating of

Lazarus from his graveclothes, in response to the command, "Loose him, and let him go." The attendant is depicted with little clothing, that his swarthy skin may contrast with the paleness of the man newly risen from the grave. The central group on our plate, from the east window of Evesham Church, is the first of a series of three figures, Enoch, Moses, and Elijah. The shadows in the flesh of these subjects appear darker in our reproductions than in the glass; but they suffice to show that the representation of the human figure in glass does not involve baldness of technique or bad drawing. The cartoon of the central panel of the Madonna and Child, Fig. 1, is from the east window of the Gothic church of the Epiphany, Washington, the subject being the Adoration of the Magi and Shepherds. Fig. 2 is the figure of an ascending saint, from the window in the American Church, Geneva. All these designs exhibit the same style of working, and the author asks: "Can we imagine any artist in the past, whether of the earlier or later periods, altering his style according to his buildings?" Italy is filled with examples showing that "in no case has an artist stultified himself by pretending to belong to a different age to his own."

Good work then, as now, is the outcome of personal feeling; it is true to the best expression of the individual artist, having nothing in common

with the imitation of tricks of manner, and it does not change with different buildings (nor with the state of the market). The volume has much more in it than we have had room to indicate, and of all the pages untouched none are more entertaining than those devoted to the "Influence of Form and Space." It concludes with some samples of design by Sir Edward Burne-Jones and Mr. W. B. Richmond, the latter being from St. Paul's Cathedral. Messrs. Macmillan have co-operated with Mr. Holiday in producing a beautiful book of lasting interest, and the cartoons, being thoroughly good, permanently enhance its pictorial value.

#### THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of this society, held on Monday evening last at the Institution's temporary premises in Savoy-street, a paper was read by Mr. Howard Martin (Member of Council) on the "Future Development of the Surveyors' Institution." The speaker began by remarking that the present prosperity of the Institution and the importance of the position which it had attained within less than 30 years of its foundation—the membership now rapidly approaching 3,000 of all classes—had naturally excited among its members a strong

\* See cartoons from this window, illustrated in the BUILDING NEWS, June 15, 1883.



desire that its prosperity should be turned to the best account, and that its future development should be worthy of its present position. Many suggestions had been made, and in his paper the author, in commenting on them, claimed to express no official opinion, but merely to give his own personal views. In less than 30 years the membership had increased as he had said, the income had reached some £8,000 or £9,000, a library of more than 6,000 valuable books had been collected, and an accumulated capital of some £33,000 had been amassed, which was now to be employed in the best of all possible ways, and invested in the best possible security—viz., in building for the Institution, on the site of its old home in Great George-street and of four adjacent houses, a house worthy to be a professional centre for the surveyors of the United Kingdom and the Colonies. (It will be remembered that in our issue of Jan. 2 we reproduced a perspective of the very striking design prepared by Mr. Alfred Waterhouse, R.A., the architect intrusted by the Institution with the rebuilding of its premises.) A remarkable feature in the growth of the Institution had been, the speaker said, the wide adherence it had received from all branches of a singularly varied profession scattered all over the country. Every young man seeking to become a surveyor in Great Britain looked to the Institution for testing and certifying his professional qualifications, and to the Fellowship as the final stamp of the completion of his professional training. In short, the Society had become recognised as a central body to which surveyors in all parts of the world might look for official confirmation of their qualifications, and for the determination of all professional difficulties and doubts, and this practically universal acceptance of its authority was the best evidence, if any were needed, of the necessity for its existence. When it was founded, in 1863, by Mr. John Clutton and other public-spirited and far-seeing men, there were competent and honourable surveyors scattered over the whole country; but they were without organisation, and the success of the Institution had shown how very real was the want which it met. There was then no standard of professional education, and, indeed, very little real technical training. There were no means of ascertaining and expressing the opinion of the profession on points touching the interests with which it was concerned. There was no tribunal before which charges of professional misconduct could be investigated, nor was there any organisation by which the interests of surveyors could be defended, or from which information on points and difficulties of practice could be obtained. Any one could call himself a surveyor, and the members of all sorts of trades did so. To remedy this very unsatisfactory state of things the Institution was established, and had, he thought, fully answered its purpose. The Charter clearly defined its objects as being the securing of the advancement and facilitating the acquisition of "the knowledge which constitutes the profession of a surveyor," and these objects he thought it could claim to have attained. The examinations secured that young men entering the profession should at all events start with a sound technical training. The means of intercommunication between members on points of practice were now perfect, and the *Transactions* contained an enormous mass of practical information, communicated by the men best competent to give it. The speaker then went into details of the current expenditure and receipts, gave the estimated additions to the former due to the increased cost of maintaining the new premises, the loss of interest on the capital invested in the new buildings, and the greater rent, rates, and taxes, and maintained that after all these had been met, there would still be a reasonable balance to meet contingencies—even taking the revenue on the basis of the year 1895, which was the last year available for his purposes. He proceeded to deal with the complaints that had emanated from some country members: that they had less benefit from the Institution than had Londoners, and showed that the expenditure on printing, examinations, salaries, postage, &c., was incurred at least as much in the interests of country members as of those in town, while the Institution premises were naturally more used by provincial members than by those who, having London offices, naturally made their appointments at their own address. A want of some strong central organisation had been felt, and met, in the case of doctors, lawyers, accountants, architects, and engineers; but he could not find that

the ruling bodies in either of these professions made any special exception in favour of their country members, while freely according to them the benefits enjoyed by London members. The establishment of scholarships enabling students to attend forestry schools on the Continent, or to receive a special course of training at the Universities, had been advocated, but the great expense of these would limit the benefit to a very small number. Courses of professional lectures would be all very well if surveyor students, like medical students, were all collected in London or other large centres; but this was not the case. At some future time courses of lectures delivered by experts, and afterwards printed and published, might possibly be useful. The keeping of a regular register of members desiring employment or seeking assistants might well be considered within certain limits. The suggestion that annuities for old and indigent members should be provided out of the Institution funds was, he thought, negated by the by-laws; but there was nothing to prevent members combining to form a fund for this purpose, the Institution providing such a benefit society with accommodation in its buildings. The question of expense seemed to be a bar to the formation of a circulating library on any large scale, and the suggestion of a club was out of the question and undoubtedly beyond the charter. A standing paid committee to decide professional questions had been advocated; but, beside being inexpedient, this again would contravene the charter. A system of introductions to members starting in business or taking appointments in new places was another proposition; but he thought the present system, carried out as it was with all possible courtesy by the secretary, was amply sufficient. He thought the proposal to establish in as many provincial centres as possible professional libraries was worthy of serious consideration, and that the holding of annual meetings for the discussion of professional subjects in the principal provincial centres in rotation would tend considerably to cement the union between town and country members. These two seemed to him the most practical and hopeful of the many suggestions which had been made for the extension of the Institution's sphere of usefulness. Mr. C. K. Bedells, who moved the vote of thanks, heartily approved of the suggestion for the establishment of provincial libraries. Mr. Wheeler, Q.C., in seconding the vote, pointed out that the Institution was still strictly bound by the terms of its charter, which distinctly barred the carrying out of some of the suggestions made. He did not, however, think it precluded the establishment of scholarships, within certain limits.

Mr. H. G. Assiter, Mr. W. H. Warner, Mr. W. H. Wells, Professor Robinson, Mr. F. B. Smith, and Mr. P. E. Pilditch having spoken, the discussion was, on the motion of Mr. C. John Mann, then adjourned.

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—VII.

By JOSEPH HORNER.

THE ductile property of iron and steel, by virtue of which they are capable of being made to assume any shape which it is desired to impart to them, is most valuable. Though not capable of being cast into the forms required, they can be treated by impact, pressure, and rolling. In certain respects the resulting phenomena are those of fluidity. The compressed



FIG. 10.

metal flows along the lines of least resistance in straight or curved lines. There is no increase of density accompanying this displacement, but a change of position only. Up to a certain point, more or less well-defined, the material is elastic, behaving like a spring; after that it becomes ductile, plastic, and semi-fluid. A bright turned or planed specimen, highly elastic, will, after testing, Fig. 10, be found to have become reduced in area by from 30 to 50 per cent. at the point of fracture, to have lost its lustre, to have become roughened, or frosted in appearance, and in the vicinity of the fracture it will be more or less

striated, showing clearly the intensity of the action which has caused so severe a flow of metal. The work expended in pulling asunder a standard test piece is about equal to that of from six to seven tons falling one inch. The same steel will show a different aspect of its fractured surfaces according to the manner in which it is tested. If broken suddenly, it will be granular or crystalline in appearance, corresponding with a rigid condition. Drawn out and broken gradually, it will appear silky or fibrous, corresponding with a plastic condition.

The following tables will serve as a ground-work upon which to base illustrations of the behaviour of the ductile materials steel and iron when being tested to destruction.

TABLE I.

SELECTED MEMORANDA, VIDE REPORT OF STEEL COMMITTEE, 1869-70. TESTS WERE MADE ON BARS 10FT. IN LENGTH.

Material.	Tension.				Compression.
	Yield stress in tons per square inch.	Ultimate stress in tons per square inch.	Contraction of area per cent.	Ultimate elongation per cent. in 10ft.	Yield stress in tons per square inch.
Bessemer steel .....	19.50	35.61	44.2	11.13	17.0
Ditto .....	21.0	34.33	45.6	11.90	21.0
Ditto .....	17.0	33.07	19.2	11.48	15.0
Lowmoor iron .....	14.0	27.80	5.9	7.01	13.50
Ditto .....	12.0	24.07	48.8	12.65	11.50

TABLE II.

SELECTED MEMORANDA, VIDE BOARD OF TRADE REPORT ON IRON AND STEEL PLATES, 1891.

Thickness of Plates in inches (mild steel).	Direction of Stress.	Stress at yield point in tons per square inch.	Ultimate tensile strength in tons per square inch.	Elongation in 10in. per cent.	Contraction of area per cent.
1	Lengthway	19.0	31.0	23.5	46.0
	Crossway	19.1	31.4	21.2	39.9
	Lengthway	15.8	28.9	29.8	53.2
	Crossway	15.7	28.6	29.9	40.9
	Lengthway	15.8	29.5	29.2	46.8
	Crossway	15.6	29.1	26.6	38.3
1 1/2	Lengthway	14.9	28.0	30.6	50.4
	Crossway	14.8	28.0	25.6	42.4

The natural elastic strength of a ductile material like iron or steel corresponds with the stress and strain from which it will recover its natural shape on the removal of the load or stress. The law of elasticity is known as Hooke's law, the author of which, Robert Hooke, put it thus:—The power of any spring is in the same proportion with the tension thereof. Engineers express the law thus:—Stress is proportional to strain. This is a highly important law, and practically holds good within the natural elastic limit. Beyond this it no longer holds good, since the strains then increase with much greater rapidity than the stresses. The limit is well marked, and is commonly termed the yielding point, or breaking-down point, though the two are not quite coincident. Crippling, permanent set, and serious deformation commence here. This, therefore, and not the ultimate or breaking strength approximately defines the load on a bar or structure. The older engineers generally paid more regard to the breaking strength than to the limit of natural elasticity. The early users of mild steel also fell into various errors, which sharp experience alone served to eradicate. They looked more to its strength than to its elasticity and ductility. They regarded it more in the light of a cast than of a rolled material. It was a natural error, and one into which engineers have often fallen in the case of other materials. It takes a long experience to demonstrate the high value of ductility, and the placing of mere strength in a secondary position. In all structures or portions of structures save those which are subjected to a purely dead or quiescent load, and such are very few indeed, the elastic property, the power to yield and return like a spring to its original form for an infinite number of times without loss of strength or elasticity, is an essential property. So, too, is the power to extend very considerably before the moment of rupture would be reached. Even though the extension should be such as to utterly cripple the structure, yet it affords a



warning which would not be afforded by a brittle structure, though strong in an absolute sense. Engineers have had to learn these lessons by the experience of many failures, and the records of those experiences can be observed in the differences in the nature of tests insisted on in the specifications of the present day and those of a generation since.

A knowledge, therefore, of the limit of elasticity of a material is quite as important as a knowledge of its absolute strength. No substance is absolutely rigid, but some are more rigid than others. To be of constructional value, a material must be elastic, and its amount must be known beforehand. A curious point about this property is that it is not strictly constant for iron and steel and other metallic bodies, but that its limits become raised artificially by repeated strainings beyond the original or natural elastic limit. The behaviour, however, of a ductile material after the yield point is passed is of little practical interest. To know that the strength may then for a time be increased by putting more work on the material does not much concern the designer, whose endeavour is always to keep the working stresses very safely within the elastic strength. But since the natural elasticity and yield point are capable of exact determination in test pieces, they serve to determine the approximate limits of stress in built-up structures.

The following table of Professor Kennedy's shows the effect of increasing the limit of elasticity on specimens of Landore steel, drawn from a length of 10in. to 11in. :-

TABLE III.

ILLUSTRATIVE OF THE RAISING THE LIMIT OF ELASTICITY BY STRETCHING LANDORE STEEL.

Area of specimen in square inches.	Length between points in inches.	Limit of elasticity in lbs. per sq. inch on original area.	Breaking load ditto.
.901	10.0	42,200	—
.863	10.43	48,810	—
.810	11.04	57,720	66,600
.890	10.0	41,000	—
.855	10.46	53,950	—
.805	11.01	56,200	62,830

The limit of elasticity and the yield point are often confounded. They are near to one another, but do not exactly coincide. The yield point will generally occur at a ton or two of stress beyond the natural limit of elasticity. The elastic limit

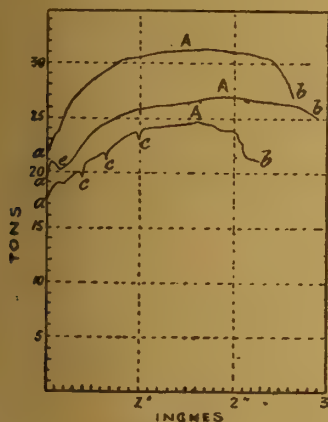


Fig. 11.

corresponds with the stress at which permanent set becomes apparent, and that becomes a question of delicacy of measuring instruments. The yield point is that at which elongation sensibly commences. Still, there is no need to lay so much stress on this point as is sometimes done, because the working load is roughly but a third of the stress which corresponds with the limit of elasticity, and is therefore safely within it. No harm can therefore come of considering the limit of elasticity and the yield point as practically the same.

Set, deflection, or deformation occurs when an elastic material is strained. The set is elastic when the material is strained within the elastic limit, it is permanent if strained beyond that limit. This is the practical and important issue, notwithstanding that minute permanent sets are

said to take place within the elastic limit. Set is the result of a viscous movement of the molecules of a material in relation to one another. The term elastic deflection is often given to that deflection which is within the elastic limit of a bar, or that amount of deflection from which the bar returns to its original form on the removal of the stress. A bar or structure therefore acts as a spring under any loads, whether dead or gradually applied, which are sensibly less than those which will cause permanent set. So that any number of applications of such loads will never weaken a bar or structure. Mr. Keep conveniently terms

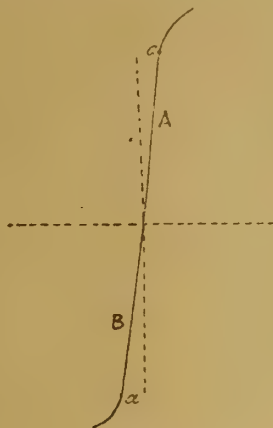


Fig. 12.

the straight stress-strain line which is within the elastic limit, a spring line, because the bar returns on the removal of the stress to its original form and position.

Instructive records of the behaviour of wrought iron and steel under stress are obtained by plotting the stresses and strains in a diagram on sectional paper, Fig. 11. The horizontal lines, or ordinates, will represent stresses in tons per square inch, and the vertical lines, or abscissae, strains or extensions, in parts of an inch. In testing wrought iron and steel, a line drawn through the points which indicate stresses and their corresponding strains will be quite straight up to the elastic limit or yielding point *a* in the figure. Then a very sudden drop occurs in the resistance of the material, strain, or extension in length, and contraction in area increasing rapidly. The specimen becomes stronger as it is drawn out, and the curve therefore ascends until the maximum load is reached at *A*, after which the local drawing-out increases, and the specimen fractures at *b* at a less load than it had borne at *A*. The extensions at *b* are those plotted for mild steel, in which fracture occurs at between 2in. and 3in. on an 8in. or 10in. test piece. In this diagram the lines plotted are straight up to *a* within the elastic limit, within which the strains or deflections are proportional to the stresses. They are not in strictness perfectly straight, but in a short test-piece the set extensions within the elastic limit are too minute to be plotted in this diagram marked for inches. In a diagram done to a larger scale there would be a spring deflection apparent, as in Fig. 12, *a* being the yield point.

Up to that point the bar acts as a perfect spring; beyond that it acts in a crippled and uncertain manner. As already remarked, the location of this point may be extended by work done upon the bar. By gradual increments of stress the bar may be taught to bear a little more stress without permanent set. This is indicated by the lower line, Fig. 11, the points *c, c, c* representing pauses in the imposition of stress. On the middle line the effect of a single cessation and reimposition of stress is indicated by the immediate rise of the curve beyond the drop at *e*. Still, a point immediately preceding *e* is the limit of elasticity, being the natural limit of an unstrained bar, and not the artificial limit imposed by stress.

No account is taken of the limit of elasticity in English specifications. In American ones its corresponding stress is embodied in specifications. The relation between the yield stress and the ultimate is well shown in the two tables given above, and it is very often included in official tests. But it may be safely assumed that if a bar fulfils the conditions of percentage elongations demanded, the limit of elasticity will be that required.

The coefficient of direct elasticity *E* is obtained by dividing the stress, *p*, per unit of area by the extension, *e* (or compression), per unit of length.

Thus,  $E = \frac{p}{e}$ . It is also termed "Young's

modulus." It is practically the same for tension and compression, iron and steel being for all practical purposes isotropic.

The maximum stress and the ultimate stress on a bar tested to fracture are not one and the same. The latter is always less by a ton or two than the former in a ductile bar. Only in a brittle crystalline bar do the two correspond.

Further, as a specimen elongates up to the point where the maximum load *A* is reached, a constantly increasing strain is borne by a constantly diminishing area. When the maximum stress is reached in a ductile material, *A*, Fig. 11, the specimen elongates locally rapidly, and will not then carry the maximum stress, but a lower one, and soon afterwards the elongation ends in fracture at a lower stress than the bar had formerly borne. This is indicated in a marked manner in the upper and lower curved line in Fig. 11. But the strain per square inch measured on a reduced section of a mild steel test-bar at the moment of fracture may be 20 per cent. greater than that reckoned on the original area of the bar. Thus an ultimate stress of 23.2 tons on the original square inch of a Lowmoor specimen became one of 27 tons on the reduced section. One of 26.43 tons on a steel plate specimen became 44.27 tons on the reduced section.

The difference between the behaviour of iron and steel is well marked. Fig. 13 is a diagram for iron, the upper line *a* showing the extension lengthway, and the lower line *b* that crossway. The contraction of area is but slight in the first, and nil in the second. The extension of the second is very much less than that of the first. The stress corresponding with the yield point is less crossway than lengthway. The lines plotted for steel, Fig. 11, are alike for each direction.

Wrought iron and mild steel being viscous substances, their molecules flow over one another under the application of these stresses. In this respect they differ from cast iron and some other crystalline metals which do not flow. Hence there is this difference between the two, that the permanent set is differently produced in the two cases. In the crystalline material it is a simple regular bending, in the fibrous material it is a crippling irregular kind of bending. Cast iron and cast steel do not therefore show perfectly straight lines on a stress-strain diagram. Deflection begins in a slight degree almost from the

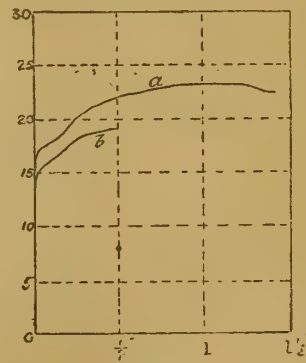


Fig. 13.

beginning thence up to the yield point, and the plotted lines are slightly curved instead of being straight. Fracture occurs almost or quite coincidentally with the yield point with abrupt suddenness, hence there is no marked drawing out of the fibre, and little or no curving beyond the yield point.

From Table I. it is seen that the yield point is nearly identical in tension and compression. This is indicated by the lines in Fig. 12, *A* being tension and *B* compression lines.

## "EXPANDED METAL" IN FIREPROOF FLOORS.

ON Monday last, at Mr. Lockwood's Yard in Sackville-street, Manchester, before a representative gathering of local engineers and architects, some interesting experiments were conducted on long-span concrete floors, into which Golding's expanded metal had been intro-



duced. The first exhibit was a continuous flat concrete floor of an area of 48sq.ft., carried upon channel iron (6in. by 3in.) and concrete arches arranged 1ft. apart, with a rise of 13in., according to the Golding system. The transverse flooring joists or girders (16in. by 6in.) were fixed 12ft. apart from centre to centre. Expanded metal of 3in. mesh had been imbedded in the concrete flooring slab, which had a total thickness of 3in. throughout. The concrete was composed of 1 part Portland cement to 3 parts of granite chippings, sieved to  $\frac{1}{2}$ in., and the work had been allowed one month in which to thoroughly set or harden. The total average weight of the flooring, with its ribs, was 35lb. per foot super.

The second exhibit comprised an arched concrete floor (on the Monier system) in which expanded metal had been imbedded. It was 3in. thick at the crown and 4in. thick at the springing or haunches. In other respects—i.e., span, area covered, ingredients of concrete, &c., the exhibit was similar to No. 1. The comparative strengths of these two structures were then tested by the application of uniformly distributed loads in the form of lead ingots weighing 100lb. each. The result was that whereas the arched ("Monier") floor collapsed under a live load equivalent to 12cwt. per square foot, the "Golding" floor (Exhibit 1) was still unbroken at the close of the experiments with a live load of 17cwt. to the square foot. These experiments were undertaken in connection with the flooring contracts for the New Brighton Tower, which is being erected under the supervision of Sir Benjamin Baker, past president of the Institution of Civil Engineers.

#### NEW THEATRE IN BIRMINGHAM.

A NEW popular theatre is being erected in Rolfe-street, Smethwick, near Birmingham, for Mr. Charles Barnard at a cost of about £8,000. The buildings cover a site of 1,500 square yards, situate in the principal thoroughfare, and almost opposite to the L. and N.W. railway station. The auditorium is 88ft. long by 52ft. wide, and consists of a pit, pit-stalls, orchestra stalls, circle, six private boxes, and an immense gallery, and provides sitting accommodation for 2,300 persons. There are convenient and spacious refreshment saloons to all parts, as also complete lavatory accommodation.

The principal entrances are in Rolfe-street, whilst the gallery is approached from a side road. There are two distinct exits from all parts of the house, the gallery having an outside iron escape staircase on either side the building, which may be used in case of panic; there are four staircases in all from the gallery. The sight-lines in the auditorium are skilfully arranged, so that every person will have a good and uninterrupted view of the stage. The stage will be 63ft. by 44ft. and 50ft. high to the gridiron, and will be constructed on the most modern principles. There is a large property-room and scene dock immediately adjoining the stage, also two star dressing-rooms. There are eight good dressing-rooms for artists divided from the stage by a wall and corridor, and a large chorus dressing-room in basement. Each dressing-room will be fitted with lavatory conveniences. The entrance to the stage and dressing-rooms is quite distinct from any other part of the building, and is approached from a 25ft. carriage-way at the side.

The whole structure will be as nearly fireproof as possible, and will be fitted with fire-hydrants throughout stage and auditorium, and will be heated by hot water on the radiator principle. It is intended to light the building by electricity.

The front elevation is of a suitable character in the Classic style, and will be executed with Ruabon bricks with Douling stone dressings. An ornamental iron verandah extends over the footpath the whole length of the building, to a height of 12ft. from pavement. The elevation will be faced with ornamental glazed tiles in parti-colours, and arranged in panels and devices illustrative of Music, Art, and the Drama. The internal decorations will be of an ornate character; tiled dadoes will line the walls of all passages, corridors, entrance, and refreshment saloons throughout.

This building, when completed, will undoubtedly be one of the most convenient and capacious of the many provincial theatres recently erected. Messrs. Owen and Ward, of Colmore-row, Birmingham, are the architects, and Messrs. J. Harley and Son, of Smethwick, the contractors.

#### COMPETITIONS.

**DOUGLAS TOWN HALL.**—At a special meeting of the Town Council of Douglas, Isle of Man, premiums for plans of the proposed town hall were awarded as follows:—First, £40, to "Mona," Mr. Arthur Ardron, F.R.I.B.A., Victoria-street, Westminster; second, £20, "Quocumque Jecris Stabit," Messrs. Wigg, Oliver, and Hudson, London, and Mr. Frank Heslop, Douglas (joint design); third, £10, "Utility," Messrs. Kaye and Clucas, Douglas. The awards were made on the recommendation of Mr. John Woolfall, vice-president of the Liverpool Architectural Society, but not until after an attempt to place Kaye and Clucas first. Certain councillors hinted very strongly that the names of the authors of the plans had been suffered to transpire, although the authorship in each instance was supposed to be kept secret until after the award.

**FOLKESTONE.**—The town council are inviting competitive designs for houses for the working classes, to be erected in a new street on the East Cliff at Folkestone, as follows:—15 four-roomed cottages, cost not to exceed £140 each; 15 five-roomed cottages, cost not to exceed £150 each; 15 six-roomed cottages, cost not to exceed £180 each; five double-tenement houses, cost not to exceed £200 each. A lithographed plan of the site may be obtained from the borough engineer, Mr. J. White, C.E., Dover-road, Folkestone, and the memorandum of the Local Government Board, dated July, 1894, under the Housing of the Working Classes Act, 1890, must be followed as regards the provision and arrangement of the buildings. Plans and designs are to be distinguished by a motto or fancy name, which must also be endorsed on a sealed envelope, containing the name and address of the competitor, for the purpose of identification after adjudication and award. Plans must reach Mr. W. G. S. Harrison, town clerk, 4, Cheriton-place, Folkestone, by 1 p.m. on Feb. 13. A premium of £10 will be given for the best design.

**GOVAN TOWN-HALL AND OFFICES.**—The instructions have just been published in this open competition, promoted by the Commissioners of the Burgh of Govan, who intend to erect public halls and offices at a total cost of about £25,000. Premiums of £100, £50, and £25 are offered, but with the proviso that, in the event of proceeding with the work, it is intended that the author of the design placed first in the order of merit shall be employed as architect for the construction of the buildings, upon the terms of four per cent. of professional remuneration, and in such case shall have no claim to the premium. The Commissioners are not, however, to be understood as binding themselves to proceed with the construction proposed, or to employ the author of the selected design as architect. The accepted design is to remain the property of the Commissioners, and to be retained by them; the other designs will be returned to their authors. The Commissioners have appointed Mr. G. Washington Browne, A.R.S.A., architect, Edinburgh, to act as assessor and to assist them in adjudicating on the designs. The final selection, however, will rest solely with the Commissioners. Any designs sent in which are not in conformity with these instructions will be set aside. The town-hall is to accommodate not less than 2,000 persons seated, and the smaller hall is to hold 500 persons. A board-room, two committee rooms, and a vestry room are among the other requirements; besides suites of rooms for town clerk, borough surveyor, treasurer, and three inspectors. The height of the portion of the buildings to be used as offices is not to exceed three stories. The Commissioners' rooms and the departments of the town clerk, burgh treasurer, and inspector of weights and measures are to be on the ground floor, all but the last fronting either Govan-road or Summertown-road. The Commissioners' rooms and town clerk's office to be arranged *en suite*. The position of the other offices is left to the discretion of competitors. The drawings are to be executed in pen and Indian ink, without colour of any sort, except a ground tint on the floors of the colours specified for each department in a schedule. A light wash of sepia or Indian ink, however, may be used for the window openings and roofs. A statement of the cubic contents of each section of the building, as well as of the whole, is to accompany the report. This cubing will be carefully checked by a measurer appointed by the Commissioners for comparison with the estimates given, and in the event of any plan ex-

ceeding 10 per cent. over the cost mentioned it will be thrown out. The drawings submitted are to comprise:—A plan of each floor and also a plan of the roofs; at least two sections; elevation of each front; a block plan showing the drainage; and such other drawings, geometrical or perspective, as may be considered necessary by the competitors for the better illustration of their designs. All geometrical drawings are to be on a scale of 10ft. to the inch. Competitors are at liberty to adopt any style in the designs submitted, and are not precluded from sending in alternative schemes. No distinguishing mark, motto, or device is to be put on the drawings, description, statement, envelope, or case, by the competing architects or their agents, and no references or remarks must be made upon any of the plans or documents forwarded which may lead to the identification of the competitor. A good stipulation is the following:—"Until after the award is made no drawings or photographs, or written or printed statements descriptive of or relating to any of the competitive designs, shall be sent or shown to any member of the Commission or to the assessor or to any other person, nor shall any of the designs or copies thereof be exhibited publicly or privately, or any canvassing of the Commissioners or of the assessor take place. The design of any competitor violating this condition will be forthwith excluded." The last day for sending in designs is March 31st.

**OSGODBY.**—In the competition for a small Wesleyan chapel and school, to be built at a cost of £600, at Osgodby, near Market Rasen, the trustees have adopted the designs submitted by Mr. F. W. Dixon, of Trevelyan-buildings, Manchester, who has been instructed to obtain tenders for carrying out the work.

#### CHIPS.

A site at the rear of the public rooms at Helston has been selected for the institute which Mr. J. Passmore Edwards has proposed to give to the town.

The foundation-stone of a new boys' school for St. Michael's parish, Bristol, was laid on the 7th inst. The building will accommodate 168 boys, and will stand on the crest of a hill adjoining the Fort. Mr. C. A. Hayes, of Bristol, has taken the contract for erection at about £1,400.

The roofs of the parish church of Broadhempston, Devon, are about to be restored under the direction of Mr. Edmund Sedding, of Athenæum street, Plymouth.

A special meeting of the urban district council for Tunstall was held on Thursday in last week, when the sanitary committee presented a report and plans of the proposed new sewerage works by the engineers, Messrs. R. A. Wood and J. Lennox. It appeared from the report that the new works would cost £20,361 10s. 9d., exclusive of £2,500 for land. The council approved the report and plans.

At the present moment there is about £21,000 in hand towards building the nave of Truro Cathedral, and this without any general canvassing, which will shortly commence. But if the work is to be accomplished it is felt that substantial help must be received from the London committee.

Mr. Thomas G. E. Elger, who died at his residence in Shakespeare-road, Bedford, on Saturday, aged 59, was a distinguished amateur astronomer and valued contributor to the *English Mechanic*, and was well known for his selenographical studies. His father was thrice Mayor of Bedford, and the deceased occupied the civic chair in 1878. Mr. Elger was for several years in the office of Sir John Fowler, with whom he was engaged in engineering works at the Menai Bridge, and in various railway constructions, notably the Metropolitan line between King's-cross and Edgware-road. Afterwards he laid down railways in Denmark until the operations were put a stop to by the war.

At the North London Police-court, on Saturday, James Biggs, 33, scaffolder, of Campbell-road, Holloway, was remanded on the charge of being concerned with three other men, not then in custody, in stealing an iron safe and about £286 in money and postage stamps from the office of Messrs. Treasure and Son, building contractors. He was also charged with being concerned with the same three men in stealing a horse, van, and harness, worth £15, from a stable belonging to Mr. A. E. Saunders, at Font-hill-mews. Messrs. Treasure are building a Board school at Cottenham-road, Holloway, and the money in question had been placed in the safe for the purpose of paying the weekly wages of the men employed. On Monday, the three labourers, named Welch, Owen, and Higgins, were remanded on the same charge, it being alleged that they were Biggs's accomplices.



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## ILLUSTRATIONS.

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## Our Illustrations.

"STAINED GLASS AS AN ART."

SEE article and further examples on p. 86.

## THE COBURG HOTEL.

THE Coburg Hotel, as now re-erected, occupies a site of 126ft. by 100ft., part of which was formerly covered by the old Coburg Hotel, of some historic interest in the early days of this century. It now forms a leading feature in the great improvement in Mount-street which has been effected by the Duke of Westminster, occupying the rounded corner at Carlos-place, which, with the opposite similar corner, creates a new and splendid approach to Grosvenor-square from Mount-street. The principal entrance to the hotel is through a porch in Carlos-place, leading to the hall, inner lounge, and grand staircase, from which the three main corridors run parallel with Mount-street and Carlos-place. The grand staircase is constructed entirely in teak round an open well-hole, with massive balusters and handrail of the same material, the spandrels and open spaces at sides being filled in with light wrought-iron screens. This staircase is continued up to the fifth floor, and is lighted by a domed oval skylight on the sixth floor level. The ground floor comprises a reading-room, 40ft. 4½in. by 20ft.; a coffee-room, 47ft. by 27ft. 4½in.; the Westminster suite of reception and private dining-rooms; the Mayfair suite of three rooms; several other private suites, and the requisite offices for management, as also the lavatory arrangements. The kitchen department in the basement is connected with the engineering apparatus for warming, electric-lighting, &c., all the appliances being of the most novel and complete description. The smoking-room is also placed on this floor, which contains rooms for visitors' servants and couriers, as well as for the hotel staff. Suites of private rooms, of varying numbers and sizes, are provided on each floor of the building above the ground floor, each suite including a bath-room, lavatory, and w.c. The hotel contains about 112 private rooms in addition to the various public rooms on the lower floors. The materials used in the exterior are red bricks and Portland stone; green slates cover the steep roofs, and the balconies and railings are in wrought iron. The entire works have been most admirably carried out by the builders, Messrs. Langdale, Hallett, and Co. The hydraulic lifts are by Messrs. Waygood. The building was designed and superintended by the joint architects, Mr. Lewis H. Isaacs, F.R.I.B.A., and Mr. Henry L. Florence, F.R.I.B.A.

## WORKS OF ART FROM SOUTH KENSINGTON MUSEUM.

THESE exquisite Italian Bronze Vases are unsurpassed for beauty in the great National Collection at Kensington. Thirty-two years

ago the central Florentine one, shown on our double-page plate, was purchased from the Piot Collection for £206. It measures 12½in. high and is 9in. in diameter. The extremely fine wax casting of this piece is enriched by conventional foliage in a Classical style round the top and upper part of the body. The lower part of the vase is decorated by gadroons, with two handles in the form of acanthus leaves. Its date is 15th century. The other vase is shown by two photographs—one in profile, and one full front, so arranged for us by the late Dr. J. H. Middleton, the Art Director of the South Kensington Museum, in order that the complete design might be evident to our readers. It is one of a pair of cast bronzes having the pitcher-like handles extending from the back to the front, ending at the rear in an acanthus leaf and terminating at the front in a dolphin's head. Below the lip of the vase is a demi-figure of a boy in high relief. The work belongs to the Late 16th Century, and the pair was bought in 1870 for £80. The height is 17½in., the width being 9½in. The ribbon bound round the vase from the boy's shoulders very much increases the piquant effect of the design, and serves as a graceful foil to the beautiful and sweet curves of the handle.

"BUILDING NEWS" DESIGNING CLUB: A VILLAGE CHURCH.

For description and list of awards, see p. 83.

## SOBBURY HOUSE, GREAT CLACTON.

This building is erected upon a pleasant site sloping to the southward, stables, vineries, &c., being along the northern boundary, and double terrace and tennis-lawn on the south side. Some of the rooms and the hall, passages, staircase, and lavatories are warmed by a medium-pressure hot-water heating apparatus, in addition to the fireplaces shown. The builder was Mr. Joseph Grimes, of Colchester. The architect was Mr. J. Osborne Smith, of Westminster.

A public inquiry was held in the Marsh Trustees' room, Newport, Salop, on Jan. 5, before Mr. F. H. Tulloch, Local Government Board inspector, relative to an application from the Newport Urban District Council to the Local Government Board to borrow the sum of £1,931 for the purpose of supplying Church Aston with water, for the excess of expenditure over the original loan for the Newport Waterworks, and to extend its system to Broomfield-place, Stafford-road, and Vineyard-road.

The Bishop of Bath and Wells visited Norton Fitzwarren on Friday for the purpose of opening a village club and hall which have been presented to that village by Mr. W. G. Marshall, of Norton Manor. The buildings include a large hall for concerts, &c., which has seating accommodation for 250; reading-room, smoking-room, recreation-room, library, &c. The building is of brick, with dressings of Ham Hill stone, and is situated at the junction of the road to Milverton with that leading to the railway station.

The will of Mr. William Smallpeice, of 42, Well-walk, Hampstead, and formerly of 6, Gray's Inn-place, Gray's Inn, district surveyor for East Hampstead, who died on September 5th, has been proved by Mrs. Harriet Susan Smallpeice, of 38, Theobalds-road, the widow and sole executrix, the value of the personal estate being £6,206 14s. 10d.

About £900 of the required £1,000 has been promised for the renovation and enlargement of the organ of the parish church of Melton Mowbray, at the hands of Messrs. Hill and Son, of London. The blowing will be by hydraulic pressure.

A new branch bank is being completed in the High-street, Lincoln. The architects are Messrs. W. Watkins and Sons, of that city, and the contract has been taken by Messrs. Wadley and Co., of Horbling, at about £3,900. The style is Late Gothic, and the façade is chiefly executed in Doulton's brown buff terracotta, made at the Lambeth Works from drawings by the architects. The building is being fitted with the electric light.

A Local Government Board inquiry was held at the Council House, Handsworth, on Friday, concerning the application of the urban district council for permission to borrow £8,500, for the purpose of erecting a refuse-destructor for the district. Mr. F. H. Tulloch, M.Inst.C.E., was the inspector appointed to hold the inquiry. The clerk to the council explained that it was desired to build an eight-cell destructor, with a chimney-stack 200ft. high, with boilers and the necessary buildings, including a couple of cottages in Queen's Head-lane, Handsworth. Mr. E. Kenworthy, surveyor to the council, explained by means of plans the details of the scheme.

## Engineering Notes.

VALE OF LLANGOLLEN.—The directors of the Great Western Railway Company have authorised important and extensive alterations and additions on the Vale of Llangollen, Llangollen and Corwen, and Corwen and Bala lines, which have for many years been worked by the Great Western Company, but have only recently been acquired by them. The new works to be undertaken comprise the doubling of the line from the junction with the Great Western main line at Ruabon to Llangollen, new and extended platforms, booking-offices, and improved waiting accommodation at the stations, and a footbridge at Llangollen. The stations from Llangollen to Bala Junction will also be greatly improved, and modern appliances are to be introduced which are calculated, amongst other advantages to the working of the traffic, to effect an acceleration in the service of the trains over the line. The work will entail a heavy expenditure on the part of the Great Western Company.

## CHIPS.

Mr. H. C. Stephens, M.P., opened a new board school at Stroud Green on Saturday. The building will accommodate 1,300 children—418 boys, 418 girls, and 526 infants. The school has been erected for the Hornsey School Board at a cost of £216,000.

A new organ, built by Messrs. Griffen and Stroud, of Bath, was opened in St. Paul's Church, Bath, on Friday.

At the Walsall Town Council meeting on Monday, on the recommendation of a special committee of the general purposes committee, a resolution was unanimously passed to take over the Science and Art Institute and Technical Day School as a municipal institution.

At the meeting on Wednesday week of the Knaresborough Board of Guardians, plans prepared by Mr. Arthur Gibson, architect, Knaresborough and Harrogate, were announced to have been approved by the Local Government Board, for alterations in the old infirmary at the workhouse, at a cost not to exceed £1,800.

The Sutherland Technical Institution and Free Library at Longton, Staffs, of which the Prince of Wales laid the memorial stone last week, will cost about £8,000.

The beautiful ruins of Birkenhead Priory, founded in 1150, have now become, by purchase, the property of the corporation of Birkenhead. They consulted the Archaeological Section of the Liverpool Historic Society, in order that all ancient characteristics might be preserved. They have placed the responsibility in the hands of Messrs. W. Haswell and Son, of Chester, who have carried out similar works of a preservative character at Valle-Crucis Abbey, Llangollen, St. John's Priory, Chester, Nantwich Church, and Chester Cathedral.

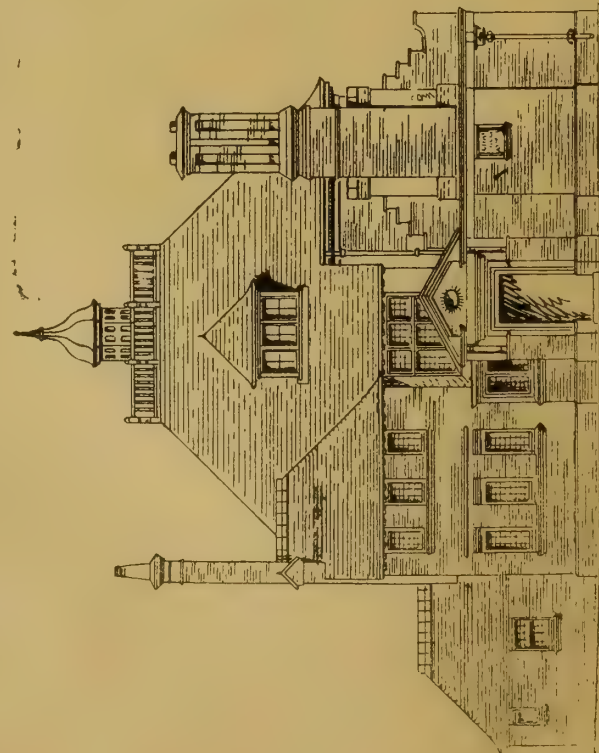
Amongst the passengers by the Cunard liner *Lucania*, which left Liverpool for New York on Saturday last, were Mr. Trubshaw, the chief architect of the Midland Railway Company, and Mr. William Towle, the manager of the company's hotel and refreshment department. The object of their visit to America is to make a thorough inspection of the great hotels of the New World, with a view to introducing some of their best features into the new hotel which the Midland Company are about to erect at the Central Station at Manchester. The company have acquired, at an enormous cost, a considerable area of land in immediate proximity to the station as a site for the proposed hotel.

The erection of the new ladies' pavilion at the Cricket Ground at Sydney, N.S.W., has now been completed by Messrs. McLeod Bros. The building is of red brick on concrete, containing two large galleries capable of seating 3,000, with tea-room and dressing-room accommodation on each floor. The cost has run into about £6,000, and the pavilion has been erected under the supervision of Mr. J. Kirkpatrick, architect, of 105, Pitt-street, Sydney.

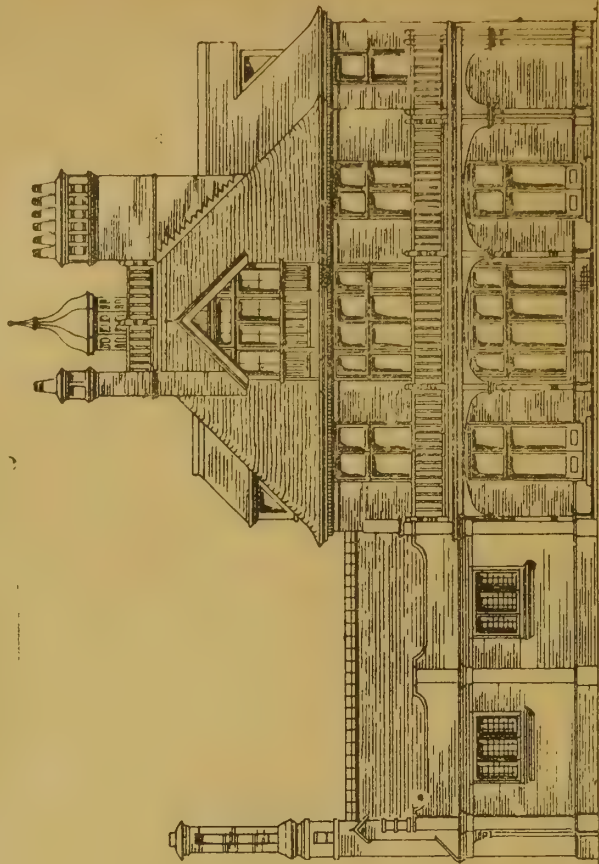
During 1896 409 new houses and shops were built in Aberdeen, an increase of 154 on the figures for the previous years, which addition to the valuation of the city was £14,822, an advance of £5,032 on the year 1895. At the same time the absorption of empty houses is going on at a greatly increased ratio, the total rental of urban property being returned to the Corporation as £4,948 at the end of 1895, and £10,132 at the close of 1896.

Table Talk for December 30 contains an excellent portrait of Mr. Silvanus Trevail, J.P., M.S.A., taken in his robes as Mayor of Truro, and some account of his principal works in Cornwall, including the hotels at Newquay, Falmouth, and Tintagel, and the Passmore Edwards Technical School at Truro.

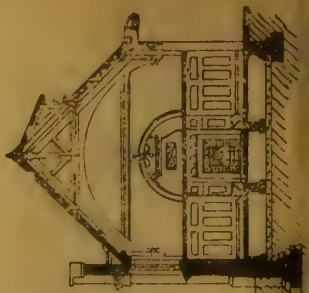
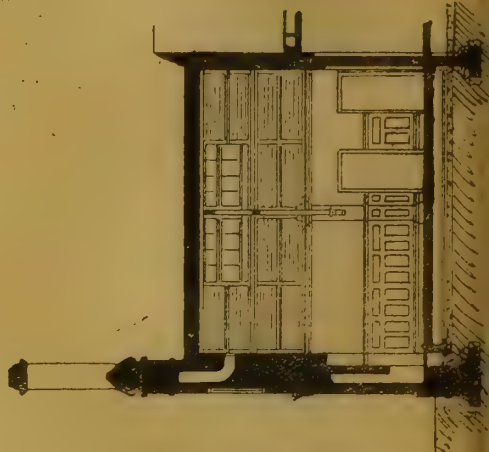
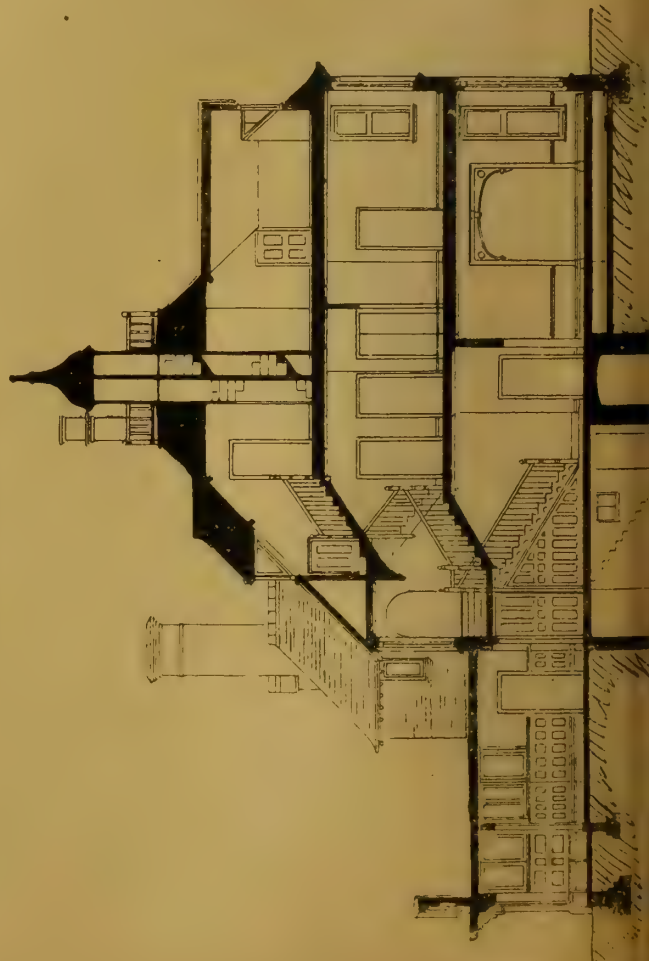




WEST ELEVATION



SOUTH ELEVATION









PLACED SECOND

: B.N.D.C. DESIGN FOR BY  
A VILLAGE CHURCH :

: ALTERNATE PLAN :  
of Vestry (or there is  
None)

The roof can be left  
open instead of closed  
as shown.

Accommodations  
Nave 222  
Transepts 32  
Choir 22  
Total 276

: VIEW :

: SECTION AB :

: SOUTH ELEVATION :

: PLAN :

Scale of Feet

Scale of Feet







843-1870 FRONT-VIEW

WORKS OF ART IN THE SOUTH KENSINGTON



BRONZE VASE ITALIAN LATE 15<sup>TH</sup> C



VS. JAN. 15, 1897.

BRONZE VASE ITALIAN 16<sup>TH</sup> CENTURY S.K.M.

S.K.M. 843-1870 SIDE VIEW

MUSEUM.



TURY S.K.M. 35 1865













THE COBURG HOTEL - GROSVENOR



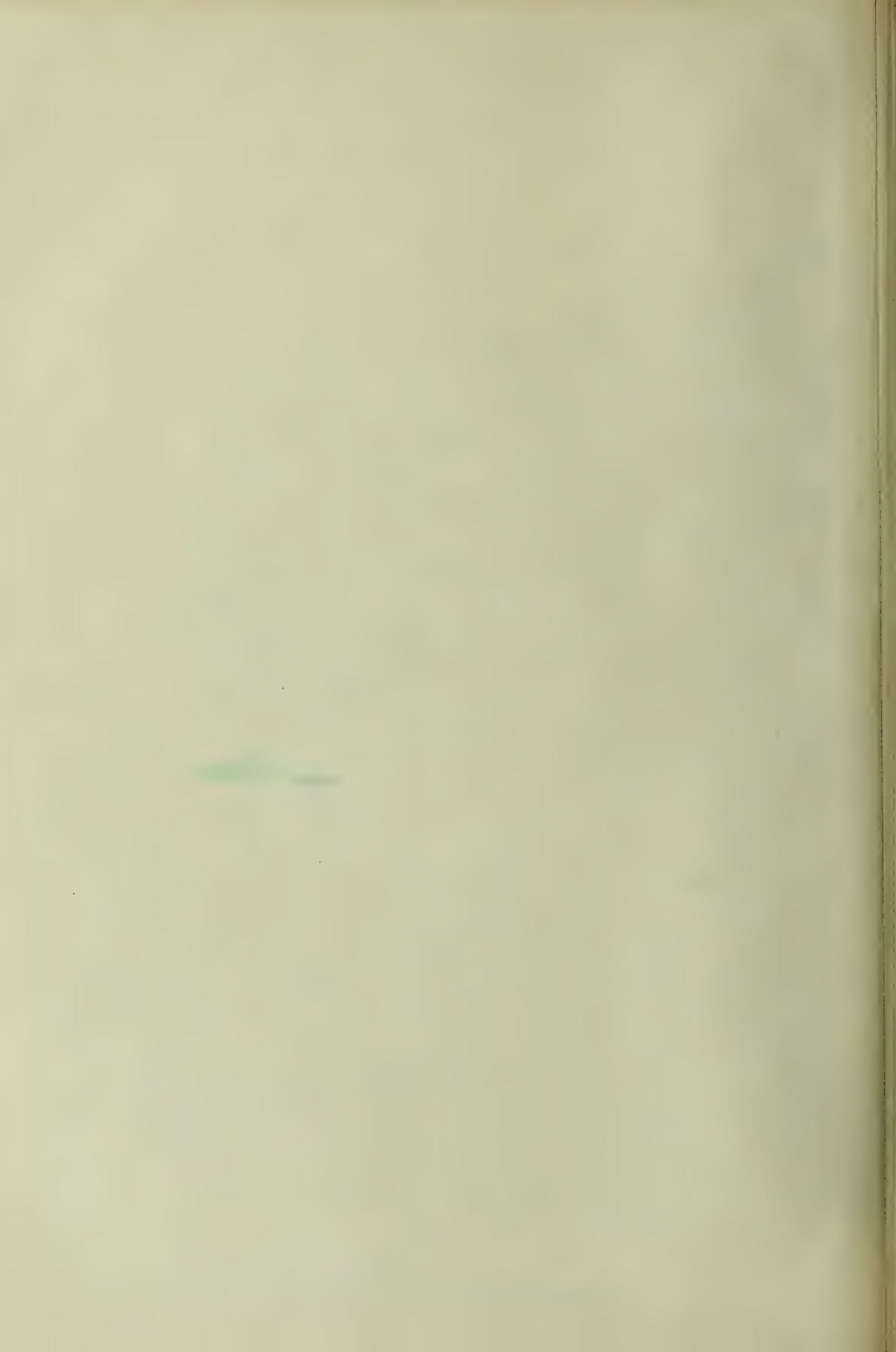
JAN. 15, 1897.



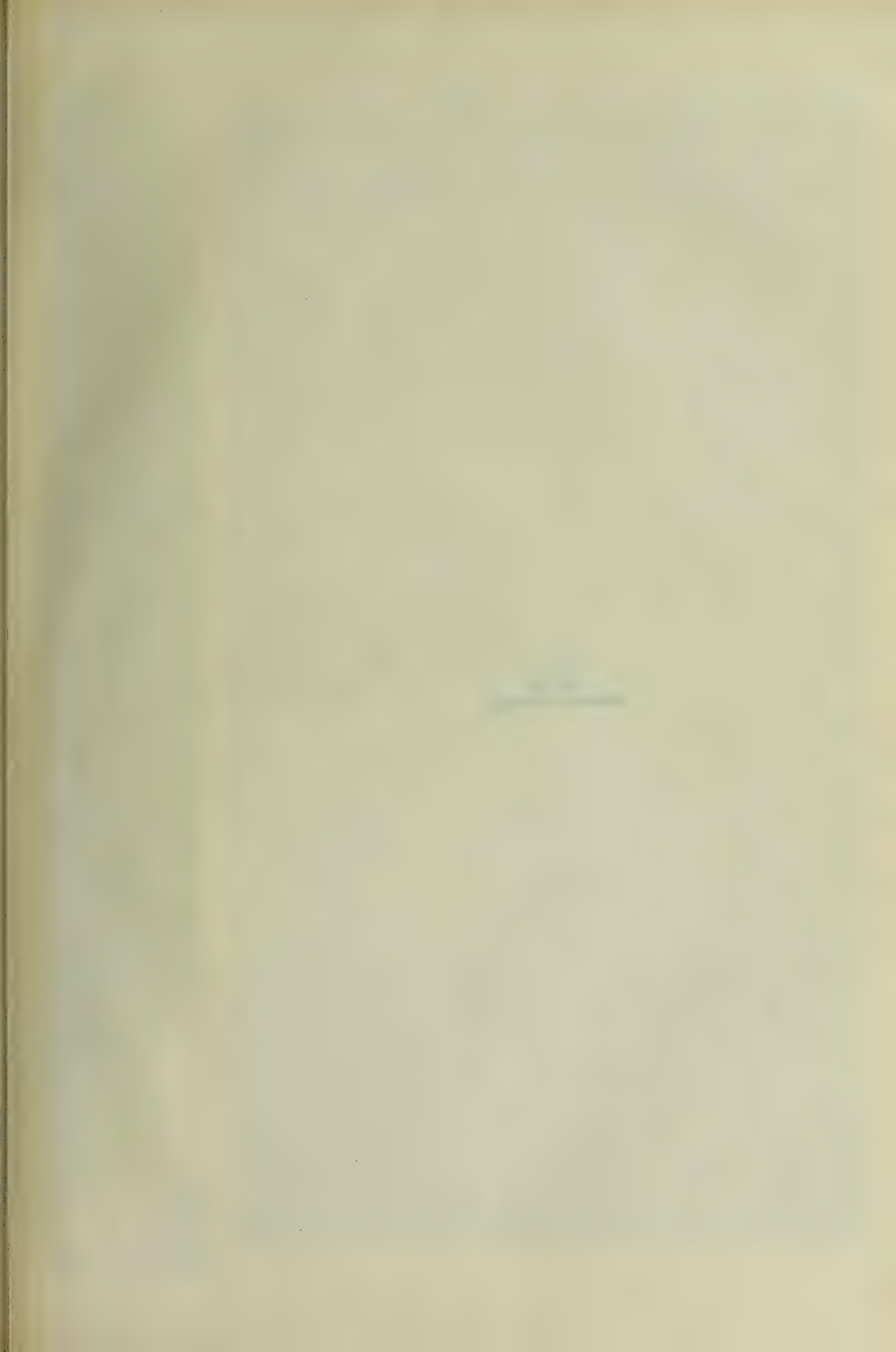
Photo Lithographed & Printed by James Akerman 6 Queen Square, W.

QUARE, W. LEWIS H. ISAACS | JOINT ARCHITECTS  
HENRY J. FLORENCE













FROM "GRACE CHURCH," NEW YORK.

HEIGHT 4-7 1/2



PART OF EAST WALL

"STAINED-GLASS AS AN





"PHOTO-TINT", by James A. Keenan 45 Queen Square London W.C.

HOW EVESHAM.

FROM "GRACE CHURCH" NEW YORK.

HEIGHT 4' 4"

ART" BY HENRY HOLIDAY.



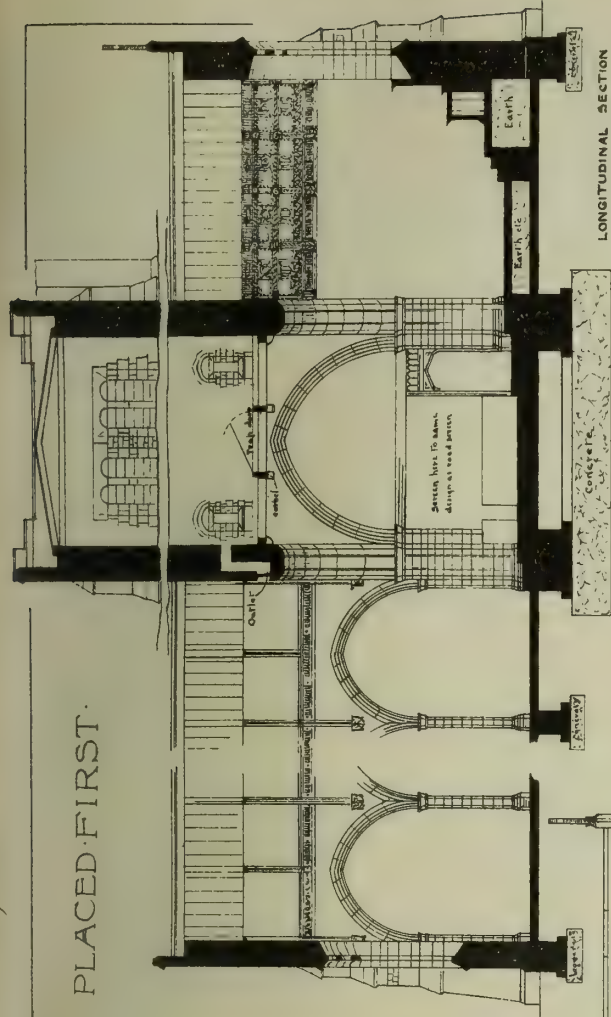
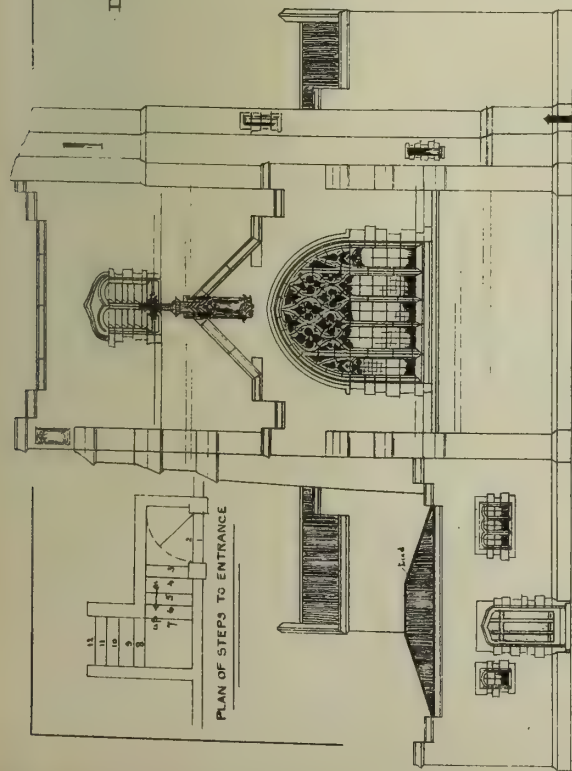
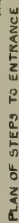




PLACED FIRST.

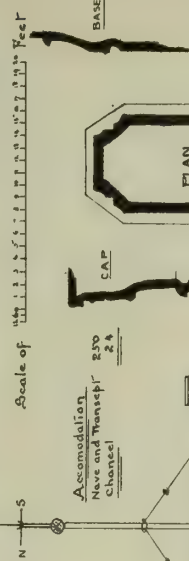
# DESIGN FOR A VILLAGE CHURCH.

BY S. LEONARD



EAST ELEVATION

SLATES



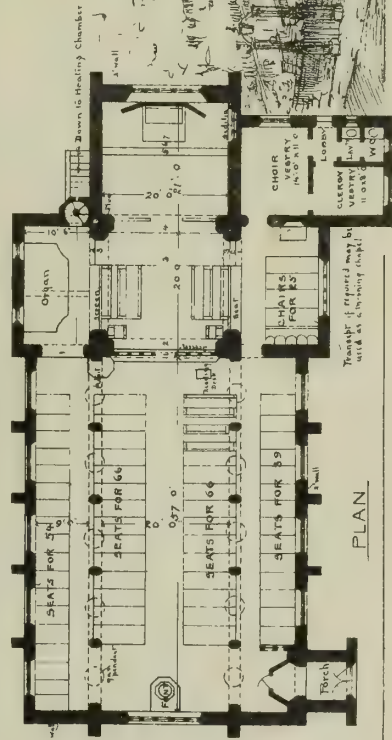
Accommodation  
Nave and Transept - 250  
Chancel - 24

Scale of Feet

LONGITUDINAL SECTION

Detail of Columns  
1" Scale

SOUTH ELEVATION



P. A. Z.

## SECTION THRO' NAVE LOOKING EAST

Photo: the prophet's dignity, 8m. diameter, 100% 3.3.3.3 W.

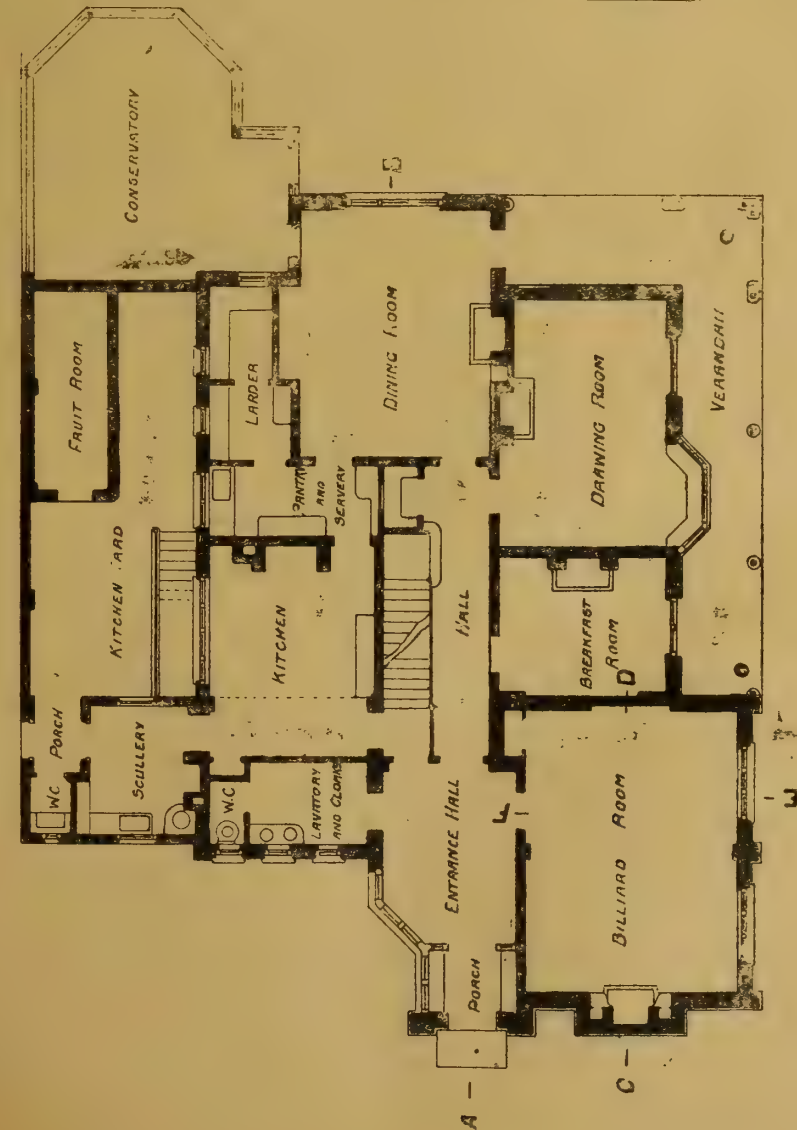




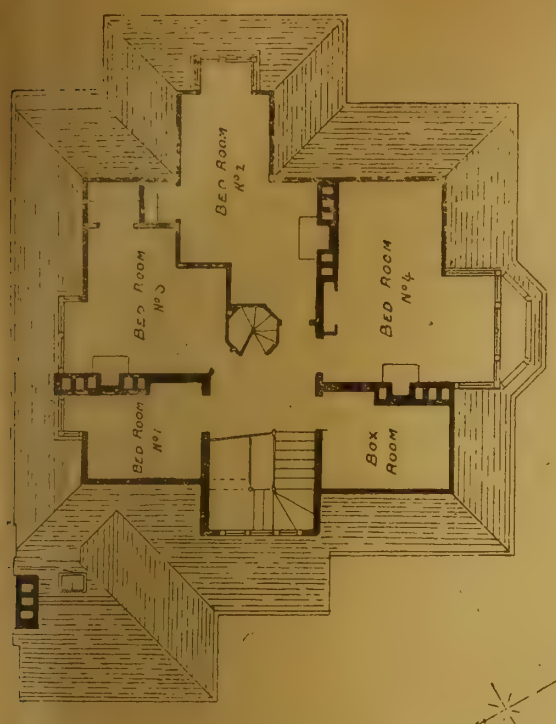


**SODBURY HOUSE, GREAT CLACTON.**

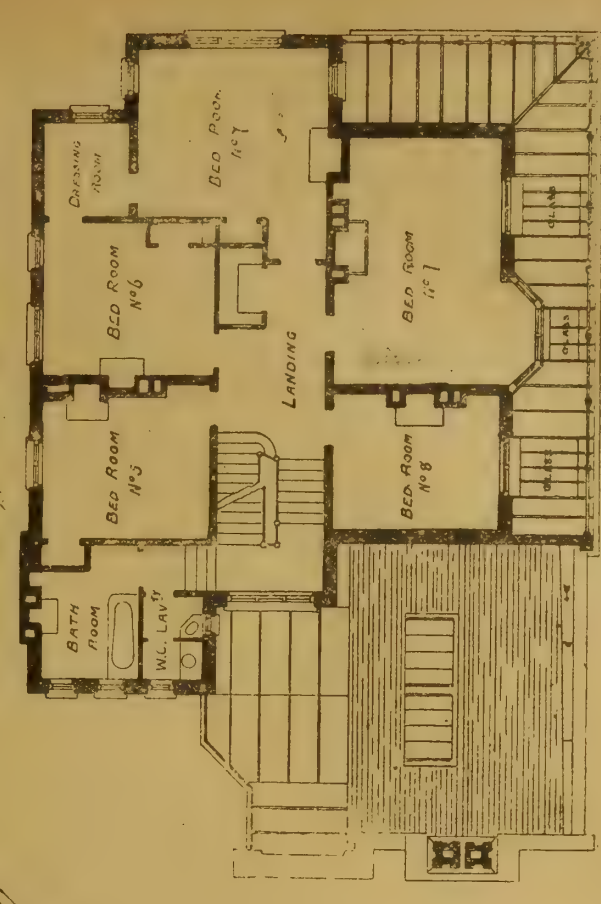
FOR  
**HENRY, GRANTEE.**  
J Osborne, Smith, Architects  
7 Old Queen Street  
Westminster, S.W.



**GROUND FLOOR PLAN**



**SECOND FLOOR PLAN**



**FIRST FLOOR PLAN**



## OBITUARY.

THE death is announced of Mr. DAVID BRANDON, F.S.A., F.R.I.B.A., at the advanced age of four score and four years. Mr. Brandon, who had long been failing, died on Sunday at his residence, No. 24, Berkeley-square, W. He was often confounded with the brothers, the late Arthur and Raphael Brandon, the authors of "Parish Churches" and "The Analysis of Gothic Architecture," but was not related to those distinguished church architects. Most of Mr. David Brandon's works consisted of country mansions and clubhouses, the latter including the large one on the south side of St. James's-square, recently completed by Mr. J. MacVicar Anderson, and the Conservative Club in St. James's-street, to which a Portland stone front has lately been added by Mr. Charles Barry. Among his few churches may be mentioned that of Highfield, Southampton, built forty years ago. Mr. Brandon had long been the senior member of the Royal Institute of British Architects, having joined as an Associate in 1839 and becoming a Fellow the following year. He sat for many years on the Council, and was elected as vice-president in 1866-7, and again from 1882 to 1885. Some years since, when a library catalogue was needed for the Institute, he paid the entire cost of its production, amounting to some £500.

OTTO LEYDE, R.S.A., one of the leading Scottish portrait painters, died at Edinburgh on Monday after two days' illness from bronchitis. Otto Leyde was a Prussian by birth, having been born at Wehlau in 1835, but when he was a lad of 16 or 17 years he went to Edinburgh and was employed as lithographic artist by Messrs. Schenk and Macfarlane. He continued there the art studies he had begun in the Royal Academy of Königsberg, and eventually devoted himself entirely to painting. Since 1859 he had been a constant exhibitor at the Royal Scottish Academy, of which body he was elected an Associate in 1870 and an Academician in 1880, and for the past ten years had been the librarian and a member of council. He was particularly happy in his portraits of ladies and children, which were characterised by grace, tenderness, and a certain air of distinction. Among his last portraits were those of the Hon. Mrs. Cheape, the late Countess of Dalhousie, Lady Mackenzie of Coull, the Countess of Wemyss, the daughter of the Duke of Atholl, and the children of the Earl of Kellie. He also painted many *genre* pictures, including "Crossing the Burn," "Wild Flowers," "The Hen Wife," and "Auld Robin Gray,"—the last his diploma picture now in the Scottish National Gallery—in which pretty children were treated gracefully and sympathetically. Mr. Leyde is survived by his widow and a grown-up family.

MR. WILLIAM T. ROBSON, 32 years of age, of Grainger-street and Crossley-terrace, Newcastle, architect and surveyor, died at Newcastle Infirmary on Monday. The deceased gentleman, who had been in an ailing state of health for some time, and under medical care, whilst walking along Newgate-street on Saturday, was seized with a fit, and was carried to the infirmary, where he died two days later.

## CHIPS.

At a meeting of St. Paul's Ecclesiological Society, held last (Thursday) evening at the Chapter House, St. Paul's, a paper was read by Mr. Joseph Grimshire, entitled "A Visit to some of the Cathedrals of Northern and Central Italy, especially those of Florence and Orvieto," illustrated by limelight views.

The Denton Holme Board Schools, Carlisle, are being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The town council of Leamington have appointed a sub-committee to obtain information as to the sites for and estimates as to the probable cost of erecting a free library, a technical institute, and a school of art.

The mayor of Bristol, the high sheriff, and the president of the Bristol Chamber of Commerce have accepted invitations to dine with the Bristol Master Builders' Association, on the 2nd prox.

Mr. Grosvenor, chairman of the technical instruction committee of the Worcestershire County Council, opened on Monday the new technical schools which have recently been erected at Hales Owen, on a site given by Lord Cobham. The schools have been erected at a cost of £1,000.

## Building Intelligence.

BENDIGO, VICTORIA.—The building of a cathedral at Bendigo was begun in November. The work has been divided into sections, the first contract being for the whole of the foundations, and the erection of the nave and aisles, two side chapels, the front of the transepts, and two of the pillars for the great tower; whilst the second contract is for the eastern portion and the central tower. The style of the building will be English Gothic. The total length from the west front in Wattle-street to the chancel will be 267ft. 6in., whilst the extreme width across the transept is 156ft., and the width of the nave and aisles 74ft. 6in. The length of the nave up to the chancel will be 188ft. The central tower will be 38ft. square. There are four octagonal side chapels, each being 20ft. wide, and two others each 49ft. by 77ft. 6in. The height of the nave and chancel from the floor to the ridge is 80ft., and the aisles 32ft. The great central tower will rise to a height of 300ft., whilst there are two smaller ones in front of the building, each one being 146ft. high. One of the principal features of the front is the main entrance with its flank doors and arcading with a great window over it. The doorway and gable rise to a height of 45ft. from the ground, and the window will be 35ft. above this, and will have five lights. The upper stories and spires of the flanking towers over the west front will be richly ornamented. The front entrance opens into a narthex, which extends across the nave and aisles. The roof of the cathedral will be open-timbered, and the nave roof will be supported by a heavy hammer beam, and finished with groups of angels. The roof of the octagonal chapels will be of grained wood, and the linings will be kauri pine, divided into panels, with top mouldings. The floors will be laid with encaustic tiles, and arcading will be carried under the level of the clerestory. Windows will fill the spaces usually occupied by the triforium. The division of the organ into two parts, one on each side, will enable the large window in the west front to be seen in its entirety. The front of the choir gallery will be arcaded. There will be a chapel on each side of the chancel. Separate sacristies will be provided for the priests and boys, and cloak-rooms, lavatories, and a strong-room are also arranged. The foundations will be built of Harcourt granite, and the superstructure will consist of Geelong and Barrabool stone. As the floor-line will be about 12ft. from the ground, the building will be reached by a wide flight of steps. The plans were prepared by Messrs. Reid, Smart, and Tappin, of Melbourne, and the contract for the first portion of the work has been let to Messrs. T. Cochran and Co., of Melbourne, the price being £31,000. Mr. George Gover, of White Hills, is superintending the work on behalf of the contractors, and Mr. Blair has been appointed clerk of works. The present contract is to be completed within three years, but it is not expected that the whole building will be finished for seven or eight years. The first portion of the cathedral will be in use in about four years' time.

CARISBROOKE CASTLE.—The public fund raised in the Isle of Wight for the provision of a memorial to Prince Henry of Battenberg is being devoted to the restoration of a portion of the ruins of Carisbrooke Castle. The work, which has already been begun, will consist in remodeling the gate-house, and transforming the guard-room and portcullis-chamber into a museum for the reception of objects of interest associated with the history of the Isle of Wight and the castle. The guard-room and portcullis-chamber are at present roofless ruins; but they are to be covered with flat roofs, the floors are to be of English oak, and the whole of the work is to be carried out in a fashion in character with the surroundings. The museum will measure 45ft. by 20ft., and there will be steps leading from it to the turrets. An old plan of the castle, bearing the date 1583, has been discovered, and it is intended to follow this plan in the restoration of the portion to which the memorial fund will be devoted.

GRAFTON UNDERWOOD.—The parish church was reopened on Thursday in last week by the late Bishop of Peterborough, Dr. Creighton. The restoration cost about £1,100. The church possesses Transitional-Norman arcades and an Early English tower, surmounted by a Late Decorated spire. The insecurity of the tower led to the

spire being taken down some twelve years ago. Now an underpinning and repair of the tower has taken place, enabling the spire to be built stone for stone as it was before, special effort being made to retain the ancient appearance of all the old features. The restoration has been carried out under the direction of Mr. J. C. Traylen, architect, of Stamford, diocesan surveyor, by Mr. S. F. Halliday, of Stamford, builder.

HALIFAX.—A new infants' Board School at Caddy Field, Halifax, was opened on Monday. The total cost of the building and site was £3,200. The plans adopted were selected in competition, and are by Mr. Joseph F. Walsh, the original scheme providing for 315 infants. At present only a portion has been carried out to accommodate 165 children. The premises include a central assembly-room, 41ft. by 22ft. 6in., three classrooms, 18ft. by 16ft., and a teachers' room. Each classroom has a separate cloakroom, and a lavatory is also provided. The whole of the works has been carried out by local firms, with two exceptions. The Warley-road Board Schools were also opened on the same day. The site of the building cost nearly £1,200, and the outlay has been £16,000. That included the flooring, which cost £909, furnishing £720, and ventilating £860. In addition to the ordinary accommodation, there are slipper and swimming-baths, a workshop, where the art of joinery can be acquired, a cooking kitchen, &c. Provision is made in the three departments for 1,132 scholars. The architects are Messrs. Horsfall and Williams, of Halifax.

HULL.—New banking premises for Messrs. Pease have just been opened. The entire area of the site has been covered with a bed of concrete, varying from 3ft. to 5ft. in thickness. The banking-hall is approached from Trinity House-lane, and measuring 66ft. by 54ft., the space for the public being 54ft. by 12ft. The interview and private rooms face Silver-street, and have mahogany screens. There are two strong rooms, placed in the rear, and these have been fitted up by Messrs. Chubb and Co. The lavatories, cloak-room, &c., are also in the rear, and are cut off from the banking-hall by fireproof doors. The first and second floor of the front part of the building facing Silver-street is utilised for board-room, residence for two clerks, and the caretaker. The building is designed in the Classic style. The plinth course and sills, together with the columns and main entrance doorway, is in dark polished granite, and the remaining portion in Ancaster stone. The carved panel over the main entrance comprises the arms of York, the Peases', and the Windmill; the arms of Hull and York form the spandrels to the cornice window. The internal fittings and screens are carried out in Cuba mahogany. The contractors who carried out the work are Messrs. F. Blackburn and Son, Peel-street, Hull; the clerk of the works being Mr. E. Grimes; Mr. W. W. Gwyther, of Temple Chambers, London, was the architect.

LONDON.—The foundation-stone of the new technical schools and public library was laid, with full Masonic ceremony, on the 7th inst. The Prince of Wales, Grand Master, was conducted to his chair on the platform by Mr. T. Fenn and Mr. Frank Richardson, acting as Grand Director of Ceremonies, and was preceded by the Grand Sword Bearer (Mr. Henry Lovegrove), and accompanied by the Earl of Dartmouth and many grand officers. The Princess of Wales entered the building with the Duke and Duchess of Sutherland, the Countess of Dartmouth and other distinguished persons, amidst ringing cheers. The stone was laid with the usual formalities, the borough surveyor, with a roll of Whatman, being presented as the architect, no other being available, the design for the new building not having been selected—in fact, the competitive plans have only recently been sent in.

Three stained-glass memorial windows, designed by Mr. C. E. Kempe, have just been placed in the sanctuary of the parish church of Cockshut.

A handsome oak font cover of Perpendicular design was at Christmas time presented to Brampton Abbott's Church, near Ross. It is pyramidal in form and octagonal on plan, the lower part being arranged to raise and lower by an ingenious system of pulleys and weights, the upper part being fixed to a bracket springing from an adjacent beam. It bears the following inscription: "To the glory of God and in memory of George Gilbert Hulme." The work has been well executed by Messrs. Jones and Willis, of Birmingham and London.



**ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.**

**BIRMINGHAM ARCHITECTURAL ASSOCIATION.**—At a meeting of this association on Friday evening Mr. E. Preston Hytch (secretary to the Birmingham Municipal School of Art) gave an address, entitled "The Architect as a Teacher." It was the duty of the architect, he said, to stimulate work in the allied arts. He could render to the community great service by facilitating the employment of worthy sculptors, mural decorators, wood-carvers, and others. In this way his influence would also penetrate beyond those craftsmen working immediately under his supervision. This intimate connection between the arts was clearly recognised in America. The attendance of young architects at the various classes of the Municipal School of Art was fraught with advantage to all concerned. It would be worse than a paradox if a community which spent large sums upon art education should itself erect unworthy buildings. Amongst the grounds for hope as to the future of architecture in England, he said, were the increasing earnestness of architects themselves, and of their work in the allied arts—an earnestness which had induced many capable architects to sacrifice to teaching in public classes, often at a pecuniary loss, much time that would otherwise be devoted to private practice. Birmingham was especially fortunate in this respect. The growing interest taken by people generally in art, the love of home, and even the possibility of the extended possession of houses which building societies afforded: the development of public spirit—all these were forces of which the architect should avail himself, and which he should adapt to the best ends. It was the duty of the architect to stimulate work in the allied arts; he could render to the community great service by facilitating the employment of sculptors and mural decorators. The possibility was considered of appointing, in connection with the First Commissionership of Public Works and Buildings, an advisory council of leading architects, chosen on representative lines; precedents could be found for the establishment of such a council. Giotto would not have done his great work at Florence had he not been appointed master of the works of the cathedral and architect of the city wall and of the towers within her territory. Attention was also called to the fact that, at least since 1885, no member of the Birmingham City Council had been in the municipal diary described as an architect. Birmingham did not stand alone in this matter, which was noticeable in view of the development of local duties, and of their interest and importance to architects. In conclusion, the lecturer summarised the work of the Municipal School of Art. A vote of thanks was passed to him, on the motion of the president (Mr. William Henman), seconded by Mr. H. T. Buckland, and supported by Mr. W. H. Bidlake.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The fourth ordinary meeting of the 49th session was held at the Law Library, Union-court, on Wednesday evening, and a paper was read by Mr. C. E. Mumford on "Belgian Churches," illustrated with limelight views. Among those present was M. E. Séve, the Belgian Consul-General to the United Kingdom, M. E. Versapreciwen, Belgian Consul, and Professor F. N. Simpson, of the Victoria University College. Mr. George Bradbury, president of the society, presided. Mr. Mumford, in his opening remarks, said Belgium was without doubt one of the countries of Europe where the fine arts had flourished, and were still flourishing with the utmost vigour. The long series of great painters who succeeded each other for more than four centuries had not alone brought her the renown which she so justly enjoyed. Architects and sculptors had contributed their part. The devotion and intellectual culture of the Flemings had been shown in the vast number of churches of high architectural merit which were to be found in the country. Few of the older buildings now in existence date back beyond the beginning of the 15th century. It was not until the Gothic style was firmly rooted in the adjacent countries that it came to be adopted by the Flemings. All the vast wealth of ornament accumulated in these churches up to the middle of the 16th century was destroyed by the Calvinist iconoclasts, and then there perished a wealth of art the loss of which was irreparable. About the commencement of the 17th century, the country again becoming prosperous, art and architecture received a new impetus, and many new churches were erected.

The builders of Belgian churches, whilst striving successfully after the beautiful, always kept the practical utility of their work well in view. About 150 slides, photographed by the lecturer, illustrating churches in the towns of Antwerp, Lierre, Malines, Brussels, Namur, and Dinant, were shown on the screen. The proceedings closed with votes of thanks to the lecturer and the chairman.

**LIVERPOOL ENGINEERING SOCIETY.**—A meeting of this society was held on Friday evening in the Royal Institution, Colquitt-street, Liverpool, Mr. George Farron, J.P., of Carnarvon (vice-president), occupied the chair. Mr. James Glover, jun., M.A., Asso. M.Inst.C.E., read "Some Notes on Current Specifications and Tenders for Public Works." The lecturer dealt with a few points in connection with specifications and quantities which in many current documents are the reverse of reasonable, and which lead to much friction and irritation between engineer and contractor, coupled very often with great financial loss to the latter. After referring to the classes of current risks, and to the arbitration clauses in specifications, and also given specimens of the most unreasonable he had met with, he concluded by suggesting that a well thought-out scheme with variations of conditions and quantities within well-defined percentage limits, and with clearly stated corresponding percentage price allowances for plus and minus excursions from the schedule average, together with an arbitration clause removing the final appeal from the engineer to a mutually respected and accepted umpire, must inevitably tend to improve the design, workmanship, quality, and progress of the contract work by enabling the engineer and the contractor to devote their respective special talents solely to the accomplishment of the work in hand, and without the irritating, distracting, and paralysing disputes so common when the extrinsic risks were not fairly provided for or excluded.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The monthly meeting was held on Tuesday night at the School of Art, Arundel-street, Mr. C. Hadfield, F.R.I.B.A., the president, in the chair. A lecture was delivered by Mr. Beresford Pite, F.R.I.B.A., president of the Architectural Association, on "The Study of Architectural Design," illustrated by numerous drawings, photographs, and black-board sketches. He stated that the modern architect suffered from lack of artistic motive. He sought it in archaeology and mere picturesque quaintness, there being now no traditional style or intuitive sense of beauty in architecture. No doubt this was as characteristic of our age as if it were quite otherwise; but it was impossible that the architectural student should be left without direction or serious intention in his study of design. Present purposes could perhaps best be served by seeking to excite enthusiasm from interest in detail work, and by understanding and analysing the beautiful qualities in the means employed in plans and working drawings, which were the instruments by which a beautiful building was obtained, and thus made up for the loss of genuine national architectural style. An architect's plans had a beauty of their own, and this was pointed out in some detail from many examples. This beauty was undiscernible in the building, and belonged to the embodiment in the drawings of the building. In the same way the sectional plans of buildings were examined, and the means illustrated from them of obtaining different architectural effects by a carefully studied interest in the sections. Elevations were grouped in different classes dominated by general ideas, such as verticality or horizontality, concentration or distribution of ornament, a picturesque grouping of sky-line, or dignified severity. These points were illustrated from photographs and sketches, as well as grandeur of line, simplicity of rhythm, luxuriousness, a simple line with a rich surface, or a rich line. The students were exhorted to thoughtfulness in detail as pre-eminently the road to good architecture. In conclusion, architecture was indicated as a decorative art, and as such the foundation of all art other than imitative. A hearty vote of thanks to the lecturer was accorded, on the motion of Mr. Henry Longden, seconded by Mr. E. M. Gibbs, and supported by Mr. T. Winder, Mr. C. J. Innocent (hon sec.), and others.

Tenders for the erection of the new Westfield School, Aberdeen, were accepted on Friday. The total cost of the building will be £7,903.

**TO CORRESPONDENTS.**

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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**NOTICE.**

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. D. and Co.—R. M.—M. B. L. B.—G. J. and Son.—A. S. and S.—P. P. and Co.

STUDENT. (Batsford, 94, High Holborn, will supply one.)

**"BUILDING NEWS" DESIGNING CLUB.**

DRAWINGS RECEIVED.—SMALL VILLAGE SCHOOL.—"Lancastrian," "Jupiter," "Cameo," "Rex," "The Wolf," "Don't Know," "Rock," "Q. E. D.," "The Dingo," "Ingleside," "Cheese," "Ard," "E. G.," "Novo-castrian," "Tyke," "The Manx Man," "Pantile," "Pickles," "Rob Roy," "Berkeley," "Toreador," "Geisha," "Moss," "St. Leonard," "Too Much Trouble," "Nap," "Diver," "Monti" (very late—see rules), "Pickwick," "Device in Shield" (Richmond), "Eros," "Arch" (all very late).

"CHARLEY'S AUNT." (We return the competitors' drawings when done with.)

"A COMPETITOR." (We are little likely to overlook any attempt at a copy of a published plan, and you are wrong in thus imputing the likelihood of others doing that which you assure us you intend to avoid.)

**Intercommunication.****QUESTIONS.**

[11606].—**Portland Cement Rendering.**—When a mixture of Portland cement and sand is used as a plaster on walls, or a floating to a concrete floor, is it not usual or necessary to specify washed sand, and, if so, why for cement any more than lime? From this it seems that to simply specify clean sharp sand, does not insure of its being a reliable composition.—LAW COURTS.

[11607].—**Hall Floor.**—I have to convert a building, formerly a dwelling house, into public offices, the entrance hall of which (being over a basement) has a boarded floor on joists. There will be a lot of traffic in this hall (the size of which is about 30ft. by 10ft.), which I fear will soon wear out the floor boards. Is there any cheap, nice-looking, and easily-applied material to be had that will stand heavy wear? Can wood-block paving be fixed in such a situation without concrete? I am also looking out for a cheap material for protecting nosings and treads of stairs. The lead and iron treads are nice, but too expensive. Any hints on above subjects will be much appreciated by—EXCALIBUR.

[11608].—**Paste for Parchment.**—Can anyone recommend a reliable glue or paste for parchment. I



have a map to finish covering several skins, and wish for a secure method of joining.—*Surveyor*.

[11609.]—**Architects' Bookkeeping.**—Can any reader name the simplest and best adapted system of bookkeeping for architects?—*F. G.*

### REPLIES.

[11605.]—**Waxing Oak Floor.**—Finely shred some beeswax and a small quantity of white wax. Pour on there a small quantity of turpentine, and when quite dissolved beat the mixture up into a cream. Rub on the floor with a piece of flannel a little of this cream, and polish quickly with a soft duster.—*E.*

### CHIPS.

In the application for discharge from bankruptcy made on behalf of George Mower and George Richard Mower (trading as G. Mower and Son), Wells-street, Hackney, N.E., builders and contractors, the order has been suspended for two years, Dec. 4, 1898.

At the Guildhall, Walsall, on Friday, Mr. F. H. Tulloch, M.Inst.C.E., on behalf of the Local Government Board, conducted an inquiry with reference to an application by the corporation to borrow £1,391 for works of street improvement.

After a long discussion the urban district council of Wallasey decided at their last meeting to adopt as the site of the proposed public offices, the Paddock, a portion of the Central Park at Liscard.

On the recommendation of the gas committee, the Manchester Corporation have agreed to spend £25,000 in connecting the various gas stations of the city with each other by means of high-pressure mains. The arrangement, it was stated, would be of great advantage in the way of enabling the stronger stations to come to the assistance of the weaker.

At the corner of Corporation-street, Lincoln, new clothiers' premises are in course of erection from designs by Messrs. Goddard and Son, of Lincoln.

An adjudication in bankruptcy has been made in the case of Arthur Young, of Idlesleigh Mansions, Victoria-street, Westminster, architect and surveyor.

A Local Government Board inquiry was held at the Withington Town Hall, on Friday, by Col. Langton Cole, with reference to an application of the council for power to borrow £4,277 for works of private street improvements in Northern-grove and Queen's-road, also £1,876 for the purpose of converting buildings in the town's yard into stables, and erecting new buildings, including cart-sheds. Mr. A. H. Mountain, surveyor, explained the proposals.

The death has occurred, at Warwick, at the age of 61 years, of Mr. John Kendall. As a young man deceased was in the estate office of Sir Watkin Wynn, of Wynnstay, and he afterwards became agent to Sir Hugh Williams, of Bodelwyddan. Mr. Kendall retired from that position some two years ago, and went to reside with his brother at Warwick. For many years he was a guardian of the St. Asaph Union. He also practised as an architect, and designed the chapter library at St. Asaph, recently erected there at the cost of the dean.

At the last meeting of the Liverpool Dock Board it was decided to grant a retiring allowance of £2,500 per annum to Mr. George Fosbery Lyster, engineer-in-chief, and to appoint his son, Mr. A. G. Lyster, who has been assistant engineer for some time, as engineer in chief, at £3,500 a year. Mr. G. F. Lyster has been dock engineer since 1861, and has carried out works at Liverpool and Birkenhead estimated to have cost nineteen millions sterling, including the remodelling of several of the old docks for the accommodation of the largest Atlantic liners. The landing-stages and floating bridges were also executed by Mr. Lyster, and the bar has been deepened from 11ft. to 24ft. at low water, while the area of the docks has been increased by 56 per cent.—viz., from 341 to 531 acres.

The Passmore Edwards Free Library at St. Ives, Cornwall, built by Messrs. John Symons and Son, of Blackwater, was handed over by the builders to the mayor and corporation of St. Ives on New Year's-day. The building having been inspected, the mayor proposed a vote of thanks to Mr. Passmore Edwards for his munificent gift, and congratulated the builders on the way in which they had carried out the whole of the work.

The urban district council of Morecambe received, on Monday, a communication read from the Local Government Board, refusing their sanction to the application of the council for powers to borrow £20,000 for sewerage purposes. The grounds of objection was that the number of outlets on the foreshore were too numerous. The surveyor was instructed to amend the plans accordingly. The Local Government Board sanctioned the borrowing of money to extend the Promenade to Bare, and to widen the promenade at the west end.

### LEGAL INTELLIGENCE.

**ALLEGED NEGLECT TO REPAIR A CHANCEL.**—At the Consistory Court of the diocese of Lichfield, held in the cathedral, on Friday, before the Hon. R. C. Herbert, Chancellor, a suit, at the promotion of the churchwardens of Shenstone, against Mr. A. Q. Kirby and Mr. Thomas Carrington Smith, as lay rectors, for wilful neglect and refusal to repair the chancel of Shenstone Parish Church, came on for hearing. Mr. Kirby entered an appearance under protest, and presented a petition objecting to the jurisdiction of the Court on several grounds. It appeared that a storm had done serious damage to the roof of the chancel, and the churchwardens had called upon the lay rectors to do the necessary repairs; the latter, however, refused to do the repairs, and denied their liability. Accordingly, to save the church from further damage, a vestry was held, and the churchwardens were authorised to do the repairs, and to notify the lay rectors that the repairs must be done under protest, and that they would be held responsible for their neglect. It was contended, on behalf of Mr. Kirby, that the defendant, being resident in the diocese of Rochester, was not amenable to the jurisdiction of the Court; and, further, that there was no offence in the articles of which the Court could take cognisance. On the other hand, it was submitted that the defendant, being a tithe-owner in Shenstone, was a ratepayer and occupier in the parish, and was therefore "inhabiting" in the diocese within the Statute 23 Hen. VIII. c. 9, and duly cited, in accordance with the decisions in "Woodward v. Makepeace" and "Machin v. Molton"; that the refusal of lay rectors to repair the chancel is an ecclesiastical offence of which the Court had special cognisance, the same procedure being adopted in "Morley v. Seacroft"; moreover, that although, as a matter of urgency, the repairs of the chancel had been done by the churchwardens, it was necessary to make the lay rectors responsible for their neglect, to prevent the possibility of its being hereafter suggested that there was a custom for the churchwardens to do the repairs of the chancel, and so exempting the lay rectors from their liability, as in the case of "Bishop of Ely v. Gibbons." The Chancellor admitted the petition of Mr. Kirby, and dismissed him from the suit, and refused to admit the articles on the ground that, the repairs having been done, there was no ecclesiastical offence which the Court had power to take cognisance of. Notice of appeal was given.

**ARBITRATION AWARDS IN MANCHESTER.**—An award has been made in respect to the compensation payable to the trustees of the late Margaret Dumville by the Great Northern Railway Company for property on the site of the intended new goods depot in Deansgate. The umpire, Mr. T. D. Wainwright, heard the evidence in Manchester on the 25th November. The total claim of the trustees amounted to £5,250, and the sum awarded is £2,460. An award has also been made with regard to the compensation payable to Gustavus Solomon Nathan by the company for property in Deansgate required for the same purpose. In this case the umpire was Mr. Frederick Fowler, who heard the evidence in Manchester on the 8th December. The total claim amounted to £5,500, and the umpire has awarded Mr. Nathan £2,190.

**RAILWAY COMPENSATION CASE AT KENTISH TOWN.**—At the London Sheriff's Court, Under-Sheriff Burchell had before him, on the 6th inst., the case of W. W. B. Rodger v. the Midland Railway Company. The action was one brought by Mr. Rodger for compensation in respect of the compulsory purchase of houses numbered 383, 385, and 387, Hugh-street, Kentish Town, and a plot of land and stabling adjoining, by the Midland Railway Company. The company had given notice to acquire the land and houses for improving their line at Kentish Town under an Act of Parliament granted in 1896, and had offered to purchase and pay compensation in respect of the compulsory purchase under the usual terms. To this the claimant had objected and claimed to the extent of £7,000, whilst the Midland Company's offer would amount to only about £4,000. On the claimant's side it was urged that the property had vastly increased in value during the past few years, so much so that the claimant had refused to renew leases in respect of the houses until he saw how the value would stand. For the company it was held that the property was not so valuable as had been made out, and that in offering to buy at twenty years, with the usual 10 per cent. for compulsory purchase, the company were paying a full and fair price. The jury fixed the compensation and purchase-money at £5,825, and the Under-Sheriff gave judgment accordingly, with costs.

**LINE OF FRONTAGES AND CORNER SITES.**—At the Clerkenwell Police-court on Monday last Mr. William Hall, builder, of 116, Elthorne-road, Islington, was summoned by the London County Council for erecting a building beyond the general line of buildings of Nicholay-road, Holloway, without having first obtained the consent of the Council. Mr. Chilvers, from the solicitor's department, supported the summons, and Mr. Ricketts,

solicitor, defended. Mr. Chilvers stated the summons was taken out under section 22 of the London Building Act, 1894, and that the defendant had begun to erect a building at the corner of Nicholay and Elthorne roads, Holloway, which was 8ft. beyond the general line of buildings of Nicholay-road, notwithstanding the Council having declined to grant their consent to the erection of the building. Mr. White and Mr. Doraston, from the architect's department of the Council, were called as witnesses, and produced the certificate of the general line of buildings as defined by the architect and also a plan of the building, which showed it to be 8ft. beyond the building line. Mr. Ricketts did not call any witnesses, but contended that, the land having been laid out for building before 1890, the case came within the exceptions contained in section 33 of the London Council (General Powers) Act, 1890, which exceptions were preserved by section 215 of the London Building Act, 1894. He further submitted that, as no notice had been served on the defendant by the district surveyor, as required by section 150 of the London Building Act, 1894, the magistrate had no power to impose a penalty. Mr. Chilvers, in reply, cited the case of "Nixey v. the Council" as overruling the defendant's first contention, and he submitted that it was not necessary for the district surveyor to serve any notice, and that under paragraph j of sub-section 11 of section 200 of the Building Act the magistrate had power to impose a penalty of £2. Mr. Bros, the magistrate, said he had no doubt the case came within the exceptions contained in section 33 of the Act, 1890, the land having been laid out for building before the passing of that Act; but he thought, having regard to the decision of the High Court in Nixey's case, that did not help the defendant, who must set his building back to the line. He also considered he had power, under section 200, sub-section 11, par. j, to impose a penalty, but he should only impose a nominal one, with the costs of the summons.

**A PORTISHEAD ARBITRATION.**—At the last meeting of the urban district council a report was received containing the award of the arbitrator, Mr. James Mansergh, on the dispute as to the amount due from the council on the sewerage contract to George Henry Williams, of Bristol, the contractor. The claims put forward by the contractor were specified in five several statements of claim, as follows:—No. 1, for work and materials as per contract, £1,549 14s. 5d.; No. 2, for extra work and materials, £3,354 10s. 4d.; No. 3, extras for delays, or by reason or on account of directions and requisitions of the engineer involving increased cost to the contractor, £1,040 10s.; No. 4, extra for work being delayed through no fault of the contractor, £1,055; No. 5, extra after the rate of £25 per week from the first day of August last to such time as the contractor shall be enabled to proceed with the works. The claim under this head amounts to £483 6s. 8d. Total claim, £7,493 1s. 5d. In addition to this sum the contractor, on account of delays alleged to have been caused by the engineer, claimed nine months' extension of time, and a further extension of eight months under several heads, such latter time to run concurrently with the nine months' extension above referred to. Of the amount claimed by the contractor, the district council admitted £1,562 18s. 2d., and paid him £1,380 on account, and were willing to pay him further sums on account, provided he put certain materials standing on private ground in the absolute possession of the council, substituted sound work and proper material for certain condemned work and material, and otherwise proceeded with the contract in a proper way. Giving the district council credit for payment of £1,380 on account, the balance due to the contractor by his five statements was £6,113 1s. 5d. Of this sum, by the award of the arbitrator, the contractor is entitled to receive £1,194 1s., the district council, on payment of this sum, to be discharged from all further claims in respect of the above-mentioned claims, and certain materials (of the schedule value of £150 approximately) alleged by the council to have been placed upon private ground, become the absolute property, and are to be placed in the absolute possession of, the council without further payment. The arbitrator has not allowed the contractor any extension of time for the completion of the works, which, by the contract, are to be completed by March 16, 1897. Each party has to pay his own costs, and one-half the arbitrator's fee.

**MANCHESTER ARBITRATION CASE.**—At the Grand Hotel, Manchester, on Tuesday, Mr. James Green (Messrs. Wetherall and Green, London) sat as umpire in an arbitration between the Burgess Trustees and the Great Northern Railway Company. The arbitrator on behalf of the claimants was Mr. William Wilson (Manchester), and for the company Mr. C. W. Stephenson (London). The claimants are the trustees under the will of Mr. Samuel Burgess. The property is situated at 346, 348, and 348A, Deansgate, and covers an area of 269 yards. It is required by the railway company for the purposes of their new goods station. The amount of the claim is £3,692 10s. On behalf of the claimants evidence was given by Mr. John Bowden, whose valuation amounted to £4,209, and Mr. R.



Bridgford, who gave a valuation of £4,259. Mr. C. A. Russell and the Hon. Mr. Colville, the barristers representing the company, having put forward their case, called several witnesses. Mr. John Cross stated that he valued the property at £1,737; Mr. G. H. Larmuth assessed its value at £1,632; and Mr. C. W. Provis at £1,355. The umpire reserved his award.

**POISONED BY SEWAGE.**—**WALDER V. SUTTON URBAN DISTRICT COUNCIL AND MAUSER.**—Mr. Justice Mathew and a special jury heard, on Wednesday, an action brought by Mrs. Walder, on behalf of herself and her four children, to recover damages for the loss of her husband, whose death, she alleged, was due to the negligence of the defendants. Defendants denied negligence. The plaintiff's husband was a gardener in receipt of 32s. 6d. per week, and, from October, 1892, down to his death in July last, resided at 2, Myrtle-grove, Sutton. Plaintiff's case was that in consequence of negligence of the defendants, the cesspool into which three houses in Greyhound-road drained overflowed in the spring of 1895 on several occasions, and the sewage ran into her garden and soaked into the ground. The nuisance became so great that plaintiff's husband communicated with the defendants, and asked them to see that it was abated at once. On one occasion plaintiff said her husband had to dig a trench to prevent the sewage which had flowed into the garden from entering the house. The nuisance was not abated, and on June 14 plaintiff's husband was taken ill, and suffered from blood-poisoning. Pneumonia supervened, and he died on July 15. Plaintiff alleged that both the defendant Mauser, who was the trustee of the houses in the Greyhound-road, and the district council had been guilty of negligence, the former in having neglected to attend to the cesspool, and the latter in not looking after the sewer through which the sewage flowed from the cesspool into the soak-away pit. The district council denied that they had been guilty of any negligence, and contended that the pipe through which the sewage flowed was not a sewer but a drain. The defendant Mauser submitted that when he heard of the condition of the cesspool he took steps to remedy the nuisance, and to have the drains of the houses connected with the main drainage system. At the conclusion of the evidence called in support of the plaintiff's case, the claim against the district council was abandoned, and judgment was entered in their favour. As against the defendant Mauser, the jury found a verdict for the plaintiff for £300. They directed that the widow should receive £140 and the children £40 each. Judgment accordingly, with costs.

**DORMERS AND THE LONDON BUILDING ACT.**—At Mansion House Police-court, on Tuesday, C. F. Kearley, builder, High-street, Kensington, was summoned before the Lord Mayor under the London Building Act, 1894, for failing to comply with a notice of irregularity requiring certain omissions to be remedied in the building of premises at No. 60, Cheapside. Mr. Hugh M'Lachlan, the district surveyor, who appeared in support of the complaint, said the builder was willing to do the work required, but the architect and owner declined. The question was whether certain dormer windows on the roof of the premises, which were constructed of wood covered with lead, were combustible within the meaning of the Act, because, if so, the party-walls must be made 12in. higher and wider on each side of them to comply with the Act, and that was what the notice served on the defendant required to be done. Mr. Daldy, solicitor, who appeared for the owner of the premises, contended that the dormers being covered with lead were not combustible, although the lead might be melted by fire. There was only a small proportion of wood, and his contention was that lead and glass were not combustible. The chief clerk (Mr. Douglas) said the list of fire-resisting materials enumerated in the Act did not include lead. The Lord Mayor, observing that it was a pity the Act was not more explicit, directed the notice to be complied with within a month, and granted 13s. costs.

**AN APPEAL AS TO FLOODING FROM SEWER.**—**ROBINSON V. MAYOR, &c., OF WORKINGTON.**—In the Court of Appeal on Tuesday, before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Chitty, an application was made by the plaintiff in this case for a new trial. The action was brought to recover damages for injury to the plaintiff's houses by the negligence of the defendants in making sewers so defective as to be incapable of carrying off the sewage of the district, and in omitting to repair certain sewers, the injury complained of being the flooding of the plaintiff's houses in consequence. Two streets named Harrington-road and Peter-street were made at the bottom of a dip in the defendant's district. In 1881 a main sewer was made by the defendants along Harrington-road, and in 1882 the houses, which the plaintiff now owned, were built in Peter-street, and a sewer ran along that street and connected with the sewer in Harrington-road. In 1889 several new streets were built and new sewers made by the builders, which carried the sewage into the Harrington-road sewer, and a short time afterwards the

Peter-street sewer overflowed and flooded the plaintiff's houses. The plaintiff's case was that, the sewers in the district being vested in the defendants by section 13 of the Public Health Act, 1875, the defendants were liable to the plaintiff under sections 15 and 19 of the Act. The action was tried before Mr. Justice Cave and a special jury, when the learned judge, at the end of the plaintiff's case, held that there was no evidence of misfeasance, but only of nonfeasance, and that therefore the defendants were not liable, the only remedy being under section 299 of the Public Health Act, 1875, either by application to the Local Government Board, or by an application for a prerogative writ of mandamus. He accordingly nonsuited the plaintiff. Mr. A. Henry, for the plaintiff, contended that the doctrine of non-liability where there was mere nonfeasance only applied to local authorities in their capacity as surveyors of highways. Here the defendants were sued as owners of the sewers. The defendants committed a breach of a statutory duty in not keeping the sewers in repair. Under sections 15 and 19 of the Public Health Act, 1875, the defendants had constructed the sewer in Harrington-road, which became insufficient by reason of the construction of other sewers in 1889. He referred to "White v. Hindley Local Board," "Blackmore v. Vestry of Mile End Old Town," "Borough of Bathurst v. Macpherson," "Touzeau v. Slough Urban District Board," "Sanitary Commissioners of Gibraltar v. Orfila," and "Glossop v. Heston and Isleworth Local Board." Section 299 of the Public Health Act, 1875, did not give any remedy for an injury causing special damage to an individual. That section applied where the local authority neglected to provide a proper system of drainage or proper sewers for their district. The non-suit was therefore wrong. Mr. Bigham, Q.C., for the defendants, said that this was admittedly a case of nonfeasance, and not of misfeasance. The only duties imposed upon this public body, so far as material, were those imposed by the Public Health Act, 1875. "Glossop v. Heston and Isleworth Local Board" was directly in point. He also referred to "Cowley v. Newmarket Local Board." The Court dismissed the application. The Master of the Rolls said that it was clear, however, that the sewers were sufficiently built at the first, and there was no evidence that they were out of repair. But the real complaint was that the defendants had not caused to be made such sewers as were necessary for effectually draining their district, as required by section 15 of the Public Health Act, 1875. That was mere nonfeasance. The case of "Glossop v. Heston and Isleworth Local Board" and Lord Herschell's opinion in "Cowley v. Newmarket Local Board" were clearly in point. The nonsuit was, therefore, right. The Lords Justices delivered judgment to the same effect.

A new church of St. George has just been built in the centre of the village of Cwm Park, Glam., from designs by Mr. J. E. Halliday, of Cardiff. It is Perpendicular in style, seats 400 persons, and consists of nave, south aisle, chancel, and broad tower only 60ft. in height. The walls are of native stone with Douling stone dressings, and the lighting is by electricity. Messrs. Knox and Wells were the contractors.

On Friday the new public school at Thornliebank, which takes the place of the one that was burned to the ground two years ago, was formally opened by Mr. M. H. Shaw Stewart, M.P. for East Renfrewshire. The school, which is Gothic in style, cost about £10,000, and has accommodation for 600 children.

A window in Hawarden parish church was dedicated on Wednesday week by the Bishop of St. Asaph, to be known as the Armenian Martyrs' Memorial window. Under an appropriate sentence from the "Te Deum" are figures of St. Bartholomew, the traditional Apostle of Armenia, and his successor, St. Gregory the Illuminator. The artist was Mr. Edward Frampton, A.R.A.

The Rochester Corporation have resolved to instruct the town clerk to return the council as dissenting from the Bill for a Chatham loop-line. The proposed loop-line would shorten the distance on the L.C.D. system between London and Dover by crossing the river at Cuxton and rejoining the main line of the London, Chatham, and Dover Railway at Newington, thus avoiding the long curve from Cuxton to Strood, by the river side, and the stoppages at the town stations of Strood, Rochester, Chatham, and New Brompton.

The large west window in the parish church of East Budleigh has recently been filled in with stained glass in memory of the late Mr. Robert Hartley Lipscomb, for many years agent to the Rolle Estate, the gift being that of the Hon. Mark Rolle. The drawings, which represent our Lord Blessing Little Children, were made by Mr. Curtis, and the work was carried out by Messrs. Ward and Hughes.

## STATUES, MEMORIALS, &c.

**WINCHESTER.**—The monument over the burial place of Bishop Thorold, in the green space beneath the southern window of the Lady-chapel at Winchester Cathedral, has just been placed in position by the cathedral masons. It was designed by Mr. Kitchin, son of the late dean, who also carried out Bishop Courtenay's tomb. The monument takes the form of a coped tomb, the ridge being decorated with a foliated cross, the foliations extending on to the sloping sides, where are also the pastoral staff and the shield of arms, bearing the sword and keys of the see and the family coat of the Thorolds, the mitre surmounting the shield. Round the upright sides and end of the tomb is the dedication: "In loving memory of Anthony Wilson Thorold, Bishop of Winchester. Born June 13, 1825. Fell asleep July 25, 1895." The large Perpendicular window in the Lady-chapel, above the tomb, is to be filled in with stained glass, as a permanent memorial of the Bishop, and the work is in hand.

## CHIPS.

Mr. James Henry Greathead, C.E., of 15, Victoria-street, Westminster, and of Ravenscraig, Leigham Court-road, Streatham, the inventor of the system of tunnelling that bears his name, has left personally amounting to £18,874. The testator leaves all his real and personal estate to his wife.

New offices are being erected for the Market Harborough Union, from designs by Messrs. R. J. and J. Goodacre, architects, Leicester. Special consideration has been given to the ventilation, which will be carried out entirely on the Boyle system.

In the rebuilding of the well-known Elephant and Castle Inn, Newington, S.E., the local authorities have arranged with the owners of the freehold, the Trustees of the Newington Charity Estates, to shift the entire building, which occupies the northern end of an island between four streets, a little to the west. By this means the narrow entrance to Walworth-road will be widened at the expense of the broad space in Newington Butts fronting St. George's-road.

The fine Norman tower of St. Peter's Church, Barton-on-Humber, is about to be restored from plans by Mr. C. Hodgson Fowler, F.S.A., of Durham, at an estimated cost of about £2,000.

William Henry Salmond, secretary of the Warwick branch of the Operative Bricklayers' Society, was sentenced at Warwick, on Monday, to two months' hard labour, in default of paying £21, including costs, he having wrongfully withheld £18 and £19 belonging to John Batchelor, general secretary and trustee, of London. Defendant was the local strike leader.

A scheme is afoot to build a larger church on the site upon which All Saints', Burton-on-Trent, now stands. The cost is estimated at £20,000.

The opening of new schools in Heyworth-street, Everton, by the Liverpool School Board took place on Tuesday. The new schools are to accommodate 1,312 children, and the cost has been £9 per head. The buildings have, in the basement, large plunge-bath, gymnasium, and workshop.

At Monday's meeting of the Glasgow Corporation a long discussion took place on a proposal made by the Glasgow Building Exchange (Limited) to revise the corporation building regulations, particularly as to the fastening of slates, the projection of wooden mantelpieces, and the requirement that windows must be so constructed as to permit of their being cleaned from the inside. The committee, by four votes to three, had recommended that a general revision of the regulations should be made. Baillie M'Phun moved approval of the committee's finding. Mr. Primrose, in moving a direct negative, argued that the regulations had stood the severest test, and had come to be recognised as an integral part of the regulations of the city. They had commended themselves to the Dean of Guild Court, and to the more intelligent and public-spirited builders in the city. By 34 votes to 9, it was decided to adhere to the regulations.

At an inquest held a short time since by Dr. E. M. Grace, in Gloucestershire, on the body of a man who had fallen into an unfenced quarry, the jury, under the direction of the coroner, returned a verdict of manslaughter against the chairman and the inspector of nuisances of the Stapleton District Council. An application was made on Tuesday to the Queen's Bench Division for a rule to bring up the inquisition with a view to its being quashed. Justices Lawrance and Bruce, after hearing the facts, granted a rule.

The Mersey and Irwell Joint Committee have resolved to oppose the Manchester Improvement Bill in Parliament. The opposition is based on the fact that no standard of purity is set up in the Bill for the effluent from the Manchester sewage works which it is proposed to discharge into the Mersey at Thelwall.



## WATER SUPPLY AND SANITARY MATTERS.

**ABERDEEN.**—The sewerage committee of Aberdeen Town Council have had under consideration a report by Mr. Dyack, burgh surveyor, on the best means of preventing flooding in various parts of the city. He stated that the existing main sewers, excellently as they have done their work during the past thirty years, were never designed to carry the volume of sewage and storm water that the rapid growth of the city now sent into them. The population requiring to be provided for at the present time was 136,000 as compared with 63,500 in 1866. What was of greater importance than the increased population was the extended area of the district to be sewered. This was 6,694 acres at the present time, against 1,280 acres in 1866, or more than five times as much. It was necessary, therefore, to adopt some radical method of dealing with the existing state of matters. The surveyor estimated that the total cost of the various proposed new works would be £160,000. He impressed on the committee the necessity of at once proceeding with works estimated at £75,700, or the construction of four portions of the scheme at an estimated cost of £34,000. The committee decided to recommend the council to proceed without delay with the enlargement of the low-level sewer as far as the outfall at Victoria Bridge. The expenditure will be about £6,000.

**SOUTHAMPTON.**—The works committee of the corporation inspected, last week, the works now in progress for the sewerage and sewage disposal of the eastern districts. Proceeding to the wharf at Chapel, the new destructor was first inspected, and attention was paid to the working of the same, together with the forced draught, and the water-tube boilers, from which the steam is to be supplied for operating the new sewage pumping engines, the fuel being the house refuse of the borough. The new engine-house, in which four compound condensing engines are to be installed for lifting the sewage of the eastern districts, together with that from the western districts, was next visited. Proceeding next to the precipitating tanks, the committee found that the external walls had been completed up to the ground level. These tanks extend over a very large area, having a capacity sufficient for the treatment of three million gallons of sewage in twenty-four hours. The system of treating the sludge by pressing in pneumatic sludge presses was also explained. The committee next proceeded to the adjoining wharf (late Gannaway's), recently purchased by the corporation as a site for the construction of additional tanks for the treatment of the sewage of the western districts, including that from Shirley and the Platform. The borough engineer, Mr. W. B. G. Bennett, who has devised the scheme, was in attendance, and explained the same in detail. The works embrace the interception of all sewage at present discharging into the Test or Itchen, and the conveyance of the same to one site for treatment previous to discharging into the river.

At the last meeting of the Kingswood Urban District Council, it was decided to instruct the firm of engineers who recently submitted a competition scheme under the *nom de plume* of "Valves" to prepare a revised scheme of sewerage and sewage disposal works for the Kingswood Urban District Council, subject to the details of the same being submitted to and receiving the approval of the council, and to the said firm furnishing satisfactory testimonials as to similar work carried on by them.

A church of ease to St. Agnes', Sefton Park, is to be built in Lidderdale-road, Liverpool. A mission chapel, costing £3,200—also the gift of Mr. Horsfall—has already been erected on the site, and was opened last Thursday evening by the Bishop of Liverpool.

At Tuesday's meeting of the City Commission of Sewers, Mr. Baylis, the solicitor, reported that the claim for compensation by Messrs. Chessum, the contractors, in respect of the construction of the new offices, had been settled by arbitration at £2,738, while £3 16s. 2d. per day had been fixed on as the sum due to the builders until the buildings were resumed or the contract ended. The original claim was £7,000. The works were suspended by a Chancery injunction obtained by neighbouring owners on a claim of ancient lights.

Some costly gifts, which have been given to the church at North Creak, were dedicated by the Bishop of Thetford, the rector of the parish, on Christmas Eve—a reredos and altar, with other sanctuary gifts, and a stained-glass window. The reredos and altar, which are made entirely of oak, were designed by Mr. W. S. Hicks, architect, of Newcastle-on-Tyne. In the centre of the reredos is a painting representing the Institution of the Lord's Supper. The subject of the window is the Childhood of our Blessed Lord, one light representing the Carpenter's Shop, and the other the Home at Nazareth.

## Our Office Table.

THE controversy with respect to the rebuilding of the west front of Peterborough may now be regarded as closed, for the Cathedral Restoration Committee have very wisely supported the Dean and Chapter in their decision to adopt the recommendations of their professional advisers, refusing to refer the matter to arbitration. The taking down and marking of the stones of the north gable was accordingly commenced on Tuesday by a staff of highly skilled workmen in the employ of Mr. John Thompson, the mayor of Peterborough, who knows more about the condition of the fabric than any other living person, and has had exceptional experience as the leading church builder and restorer. The stones were found to be perished to a greater extent than was expected.

We have received from the Society of Antiquaries a very lengthy document showing the action they have taken with the S.P.A.B., and giving a detailed specification prepared by Messrs. Thackeray Turner, W. R. Lethaby, Detmar Blow, Philip Webb, and J. T. Micklethwaite (who have, singularly enough, obtained a certificate as to the efficiency of their scheme from a civil engineer). This joint-stock company of architects, amateurs, and engineers explain their proposal for securing the front without rebuilding as one of shoring up and then removing the stonework at the back in small sections, and replacing it by new material laid in cement, "on the cantilever principle." As this gratuitous advice has not been considered by the committee, it is needless to discuss it further than to point out that a lofty surface, in an admittedly rotten condition, could never be homogeneously united to such an unyielding backing; and the suggestion recalls the parable concerning the impracticability of repairing an old garment with new cloth, for "that which is put in to fill up taketh from the garment, and the rent is made worse." A counterblast to the protests of the anti-restorationists has been signed by nearly forty architects practising in Leicester, the largest town in the diocese, expressing their full confidence in the judgment of Mr. Pearson, on the ground that his past record shows that "any work he does will be of the most reverent and conservative character." They endorse this opinion in the most practical manner by forwarding a subscription of £71 towards the restoration fund.

The townspeople of Bury, Lancashire, have received a welcome New Year's gift in the acceptable form of a collection of modern oil-paintings and water-colour drawings, formed by the late Thomas Wrigley, of that borough, and presented to the corporation by his three children. The collection is estimated to be worth over £60,000, and includes among other works, "Calais Sands," by Turner; E. M. Ward's "Fall of Clarendon"; "Samuel" and "Timothy," by James Sant; Landseer's "Random Shot"; "Apollo," by Briton Riviere; two examples each of David Cox, W. Collins, Linnell, Patrick Naesmyth, Clarkson Stansfield, and P. F. Poole; and works by Sir A. W. Callcott, Sidney Cooper, Elmore, Pyne, Goodall, Hilton, Horsley, Müller, MacIise, Creswick, Faed, and others; while there are water-colours by Sir John Gilbert, Cattermole, Barrett, Turner, Cox, and De Wint, and four pieces of statuary. Until the corporation provides a suitable picture-gallery the works are to remain at Timberhurst, the residence of the Wrigley family.

THE Art Gallery Purchase Committee of the Birmingham Corporation has recently, says the *Birmingham Post*, acquired, for the permanent collection, a few objects which will be of interest to those engaged in the jewelry trade and decorative iron trades of the city. Mr. Whitworth Wallis purchased, whilst in Berlin, a very large example of decorative wrought-iron work. It is a bracket, nearly 7ft. long, and 3ft. 3in. wide on the wall side. It consists of floral and scroll work, and is worked on both sides, an extremely rare occurrence. It formerly carried the sign of an inn, in the Jacobstrasse, Augsburg, and is of the beginning of the 17th century. Another example is a small circular sign, painted and partially gilt, also of South German workmanship. A waterspout of bronze, with the tap for turning on the water in the form of a mermaid, formerly stood in the Bishop's Palace, Augsburg, and is of the 18th century. There are also two fine chiselled iron knockers of South German workmanship of the 17th century. Three examples of modern

German jewelry were acquired by Mr. Wallis at the Berlin Exhibition as examples of the goldsmith's work, in which enamel plays a leading part. They are the work of one man in Berlin. The principal example is a necklace and pendant of gold, the pendant consisting of an opal heart surrounded by small diamonds, and surmounted by a ruby, all set in a floriated scroll border of translucent enamels of delicate tints. There are further two gold pendants, one set with diamonds and pearls, with a rose branch in translucent enamels. The other is of a more conventional design, but similarly enriched with enamels.

The special committee of the London County Council, which is inquiring into the management of the Works Department, resumed its sittings on Wednesday. Mr. Thomas Blashill, superintending architect to the Council, was further examined, and said the great difficulties of the department arose from not getting the proper amount of work out of the men. There had in the past been great waste of time on the jobs, due, he considered, to the workmen's bigoted adherence to trade rules. He by no means contemplated the abolition of the department. With reference to the future, everything depended on the proper supervision of the workmen, and the manager must not hamper the foremen. Mr. H. E. Haward, comptroller to the Council, put in a long statement covering the whole history of the discovery of irregularities in the bookkeeping of the department, in which he stated that not only were documents fabricated, but after he had challenged them every effort was made by officials of the department to induce him to pass the entries and prevent further investigation. In reply to questions, he said the malpractices that had led to the investigation had involved no pecuniary loss to the Council. The witness was under examination when the committee adjourned.

"THE Artistic Treatment of the Human Figure" was the subject of a lecture given by Professor Cleland at the Corporation Art Gallery, Glasgow, on Saturday night. The lecturer pointed out that under the term "artistic treatment," there might be included not only the representation of the human figure, but the management of the body in gesture, expression, and dress; but the remarks which he proposed to make had principally reference to accurate representation. The human figure might be represented either ideally or realistically—either as it ought to be, or as it might in individual instances occur, marked by idiosyncrasies, shortcomings, and peculiarities, which might even be exaggerated into caricature. It would be generally granted that nude painting had its most legitimate and highest field in the representation of the ideal perfection of form. Playful fancy, no doubt, was not to be confined to hard-and-fast rule, and even in a Silenus by Rubens there was much to learn; but that was on account of the consummate skill displayed by that great master in appreciating what was possible, likely, and natural, with given proportions of a clumsy and preposterous kind. Nothing, however, could make the dislocated joints, expressionless faces, and constrained impossibilities of posture tolerable which resulted from want of knowledge of the capabilities of the human frame. This knowledge was so essential for the management of draped figures that some of the greatest old masters had been in the habit of working out in detail in the nude the studies of figures which appeared in the subsequent painting clothed in flowing robes. Another point to be kept specially in view was the appearance of balance. No mass of matter could continue in a position in which a line dropped from the centre of gravity did not fall within the limits of the base of support, and the living body was no exception to the rule. In conclusion, Professor Cleland described the different forms of the head and face as they vary according to race, sex, and age.

THE building trade in Grimsby during 1896 was marked by a steady briskness throughout the year, one or two firms, particularly Messrs. Hewins and Goodhand, having been uniformly busy from Christmas to Christmas. The only buildings of note have been the new ice factory (Messrs. Hewins and Goodhand, contractors), the Heneage Board School extension (Messrs. Thompson and Son), the Welholme Board School extension (Messrs. Hewins and Goodhand), the Cleethorpes Board School (Mr. H. Marrows), Park-street Mission, and one or two smaller erections. House building has not progressed so rapidly as in former years, partly because the



builders have already more than met present needs, and partly because the land now in the market is too expensive to tempt speculation. In the Weelsby district, on the Littlefield estate, and on the west side of Cleethorpe-road there are signs of business. Last year passed without any further friction between masters and men, and it is stated that the very best terms now exist. Altogether the year was a satisfactory one, only blurred by the failure of two large businesses.

THE use of electricity for suburban traffic in the States is receiving attention again, and a paper on the subject has been read by Mr. J. Findlay Wallace, M.Am.Soc.C.E., before the American Society of Civil Engineers. The problem is the desirability and economy of adopting electric power for suburban traffic. The question is again under the consideration of the Illinois Central Railroad. The author gives a diagram showing the tracks devoted exclusively to his service in the City of Chicago. The author writes: "Comparing the use of steam and electricity as motive powers, as a general principle it may be stated that electricity is more desirable and economical for handling a large number of small transportation units at frequent intervals over short distances; whereas steam-power is more desirable and economical for handling large units and transportation at high speeds at infrequent intervals and over long distances. The series of questions submitted to the leading electric manufacturing companies in the United States, and the answers received, will be found of practical interest to all those who think of substituting electricity for horse-power or steam on street-railway lines. Where the units of transportation are small, and moved at frequent intervals through short distances, the substitution appears to be desirable.

The managers of the South Metropolitan Schools at Sutton have decided to erect an infirmary at the Witham School, which is estimated to cost £4,000.

The Liverpool City Council approved on Wednesday generally of the Parliamentary Bill under which, for a sum of £95,000, the corporation commute their liabilities in regard to certain of the city churches, subject to its being so amended that the churches of St. George and St. John shall be closed next year to enable the former to be removed by the corporation in two years from the passing of the Act, if it has not been removed before by the trustees. Under the Act the corporation obtain without any other payment the sites of St. George's at the top of Lord-street, and St. John's on the west side of St. George's Hall.

A proposal is about to be submitted to the inhabitants of Portsmouth to celebrate the "diamond jubilee" by rebuilding the local hospital. Mr. Keith D. Young, F.R.I.B.A., of Southampton-street, Bloomsbury, on being consulted, arrived at the conclusion that it would be a waste of money to make further alterations in or to patch up the present hospital, as it would be impossible to adapt the building to modern ideas. In consultation with the hospital committee Mr. Young received instructions to draw up a ground plan, adopting the pavilion principle, so that one block at a time may be built. The committee proceed as early as possible with the first block, which is to accommodate 60 beds.

At a meeting of the Loughborough Town Council, held on January 4th inst., a letter was read from Joseph Griggs, J.P., D.L., offering to erect and present to the town public baths at a cost of £3,000, to commemorate the completion of the 60th year of her Majesty's reign, upon a site to be provided by the corporation. The borough of Loughborough has previously benefited by the generosity of Mr. Griggs, who held the office of mayor for the first two years after the incorporation and the office of high sheriff of the county during 1895. Mr. George H. Barrowcliff, architect, of Loughborough, has been entrusted with the work.

An accident occurred on Wednesday morning at the Eiffel Tower which is in course of construction at New Brighton, near Liverpool, two men being killed and a third seriously injured. The deceased were in the employment of Mr. Handyside, of Derby, the contractor for the ironwork of the tower. They were working on a scaffold 35ft. from the ground, and were engaged fixing an iron girder, when the hook of the crane used for lifting the iron gave way. The girder, which was swinging from the crane, fell, and in its descent it struck the scaffold on which the men were working, entirely demolishing it. Two of the men (John Richards and Alexander Stewart) were instantaneously killed, while a third workman, named John Daly, was injured, and had to be removed to the Seacombe Hospital.

## MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—British Institute of Certified Carpenters. Carpenters' Hall, London Wall. 6 p.m.

MONDAY.—Royal Institute of British Architects. Distribution of Prizes and Presidential Address to Students. 8 p.m.  
Society of Arts. "Material and Design in Pottery," Cantor Lecture No. 1, by William Burton, F.C.S. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on Professor Ripper's lecture on "Superheated-Steam Engine Trials," and Papers on "The Diversion of the Periyar," by Colonel J. Pennycook, C.S.I., R.E.; and "The Periyar Tunnel," by Mr. P. Roscoe Allen. 8 p.m.

WEDNESDAY.—Society of Arts. "The Roller Boat of M. Bazin," by Emile Gautier. 8 p.m.

THURSDAY.—Devon and Exeter Architectural Society (Three Towns Branch). "Local Gothic Architecture," by Edmund Sedding. The School of Art, Princess-square, Plymouth. 7.30 p.m.

## CHIPS.

At Crewe, on Friday, Dr. Wheaton, on behalf of the Local Government Board, held an inquiry into an application by the town council to borrow £2,000 for isolation hospital purposes.

The town council of Bolton have approved of a scheme for the erection of a new fire-station and firemen's dwellings at a cost of £12,000, and decided to offer £50 and £20 to local architects for competitive plans.

The will of Mr. William Henry White, the secretary of the Royal Institute of British Architects, of 8, Oxford and Cambridge Mansions, Marylebone-road, who died on Oct. 20, has been proved by Colonel George Augustus Webster, of 3, Wilbury-avenue, Hove, the brother and sole executor, the value of the personal estate amounting to £186 5s. 9d. only.

Mr. A. H. Walker, chief assistant to Messrs. G. and F. W. Hodson, engineers, of Loughborough, has been appointed borough surveyor to the Loughborough Corporation from among 78 candidates.

The dissolution of partnership is announced of G. H. Grimwood, A. Grimwood, and F. J. Grimwood, builders and contractors, Sudbury and Ipswich, under the style of George Grimwood and Sons.

The memorial-stone of new buildings in course of erection in West George-street and Renfield-street, Glasgow, for the Lancashire Insurance Co., was laid on Thursday in last week. The building has frontages of 61ft. and 109ft. respectively, and is Venetian in style, the façade being of Dumfries red freestone, with granite columns. Mr. Thomson, of Glasgow, is the architect.

The statue of the late John Bright was removed from the Central Hall at Westminster a few days ago, and workmen were engaged on Wednesday and yesterday taking away the pedestal on which it had rested.

At the Town-hall, Warrington, on Friday, Col. W. Langton Coke conducted an inquiry on behalf of the Local Government Board in connection with the application of the Warrington Corporation to borrow £43,731 for the purpose of street improvement.

A dedication service was held on Wednesday week at the new vicarage at Bitterne, near Southampton. The building is Domestic Elizabethan in style, and is faced with red bricks and roofed with tiles. The cost has been £2,300. Mr. J. B. Colson was the architect, and Messrs. Witt Brothers, of Bitterne, executed the contract.

The Corporation of Chatham are considering the advisability of tendering themselves, through their architect, for the erection of the town-hall and municipal buildings, and undertaking the work if no other tender is within £250 of the sum they decide on. Trades Union and Labour Union rates of wages and hours of employment would be observed.

The Earl of Derby presided on Monday at a meeting of the trustees of the Manchester Rural Infirmary for a formal reception of the result of a poll on the question of rebuilding. Afterwards, at a meeting held informally, an intimation was made that, in view of the strong division of opinion on the subject and of the smallness of the majority in favour of rebuilding on the present site the infirmary board would not proceed without further deliberations. It is therefore likely that the question of sites will be considered afresh by a joint committee representative of the Infirmary Board and of the City Corporation.

Major H. E. McCallum, Colonial Engineer and Surveyor-General of the Straits Settlements, has been appointed Governor of Lagos, in succession to Sir Gilbert Carter, who has resigned.

## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£6 0 0
Rolled-Steel Joists, English.....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates.....	6 15 0 "	—
Bar Iron, good Staffs.....	6 10 0 "	7 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 10 0
Do., Welsh.....	5 15 0 "	5 17 6

## Boiler Plates, Iron—

South Staffs.....	7 16 0 "	8 0 0
Best Smedshill.....	9 0 0 "	—
Angles 10s., Tees 20s. per ton extra.		

Builders' Hoop Iron, for bonding, &c., £6 10s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £13 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
8ft. to 8ft. long, inclusive gauge.....	£10 15 0	£11 0 0
Best ditto.....	11 5 0	11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£5 10 0 to	£3 10 0
Cast-Iron Stanchions.....	5 10 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6

Cast-Iron Socket Pipes—  
3in. diameter..... 5 10 0 " 5 15 0  
4in. to 6in..... 5 5 0 " 5 10 0  
7in. to 24in. (all sizes)..... 5 0 0 " 5 2 6  
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to 110s.	
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.	
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes.....	75p.c. Fittings 77p.c.	
Water-Tubes.....	70 " 72½	
Steam-Tubes.....	62½ " 65	
Galvanised Gas-Tubes.....	60 " 62½	
Galvanised Water-Tubes.....	55 " 57½	
Galvanised Steam-Tubes.....	45 " 47½	

	10cwt. casks.	5cwt. casks.
Sheet Zinc, for roofing and working up.....	£20 10 0 to	£21 10 0
Sheet Lead, 3lb. per sq. ft. super.....	12 15 0 "	13 0 0
Pig Lead, in 1cwt. pigs.....	11 13 9 "	11 15 0
Lead Shot, in 28lb. bags.....	15 0 0 "	—
Copper Sheets, sheathing and rods.....	55 0 0 "	—
Copper, British Cake and Ingots.....	52 0 0 "	53 10 0
Tin, Straits.....	59 15 0 "	60 0 0
Do., English Ingots.....	63 10 0 "	65 10 0
Spelter, Silesian.....	17 0 0 "	17 5 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in. ....	£3 5 0 "	—
Cut Floor Brads.....	8 0 0 "	—
Wire Nails (Points de Paris)—		
0 to 7 8/9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/3 16/3 per cwt.		

## TIMBER.

	per load	£13 10 0 to	£16 0 0
Teak, Burmah.....			
" Bangkok.....	11 0 0 "	15 0 0	
Quebec pine, red.....	—	—	—
" yellow.....	2 0 0 "	4 0 0	
" pitch.....	—	—	—
" Oak.....	4 15 0 "	5 15 0	
" Birch.....	3 10 0 "	5 5 0	
" Elm.....	3 5 0 "	4 10 0	
" Ash.....	2 10 0 "	3 15 0	
Dantsic and Memel Oak.....	2 10 0 "	3 10 0	
Fir.....	2 10 0 "	4 5 0	
Wainscot, Riga p. log.....	2 10 0 "	4 10 0	
Lath, Dantsic, p.f.....	4 10 0 "	5 10 0	
St. Petersburg.....	5 0 0 "	6 10 0	
Greenheart.....	8 10 0 "	9 0 0	
Sequoia, U.S.A. ...per cube foot	0 2 0 "	0 2 2	
Mahogany, Cuba.....	0 0 4½	0 0 6	
" Honduras.....	0 0 5 "	0 0 6½	
Cedar, Cuba.....	0 0 4½	0 0 5	
" Honduras.....	0 0 4 "	0 0 5	
Walnut, Italian.....	0 0 3½	0 0 7	

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in.

Quebec, Pine, 1st.....	£21 0 0 to	£24 0 0
" 2nd.....	15 0 0 "	17 0 0
" 3rd.....	7 10 0 "	11 0 0
Canada Spruce, 1st.....	9 0 0 "	10 10 0
" 2nd and 3rd.....	7 10 0 "	8 15 0
New Brunswick.....	7 5 0 "	7 15 0
Riga.....	7 0 0 "	8 0 0
St. Petersburg.....	8 0 0 "	13 0 0
Swedish.....	8 10 0 "	16 0 0
Finland.....	8 10 0 "	9 0 0
White Sea.....	10 0 0 "	16 10 0
Battens, all sorts.....	5 0 0 "	20 0 0

Flooring Boards, per square of lin—		
1st prepared.....	0 9 6 "	0 16 6
2nd ditto.....	0 8 0 "	0 13 0
Other qualities.....	0 6 0 "	0 7 6

## Staves, per standard M:—

Quebec pipe.....	—	—
U.S. ditto.....	35 0 0 "	42 10 0
Memel, cr. pipe.....	230 0 0 "	240 0 0
Memel, brack.....	200 0 0 "	210 0 0

## OILS.

	per ton	£15 7 6 to	£16 0 0
Linseed.....			
Rapeseed, English pale.....	27 10 0 "	28 0 0	
Do., brown.....	27 0 0 "	27 10 0	
Cottonseed ref.....	15 10 0 "	16 0 0	
Olive, Spanish.....	29 0 0 "	30 0 0	
Seal, pale.....	23 0 0 "	24 0 0	
Cocanut, Cochín.....	27 15 0 "	28 10 0	
Do., Ceylon.....	23 10 0 "	23 15 0	
Palm, Lagos.....	24 10 0 "	25 0 0	
Oleine.....	19 0 0 "	20 0 0	
Lubricating U.S..... per gal.	0 6 3 "	0 7 6	
Do., black.....	0 4 9 "	0 6 6	
Tar, Stockholm..... per barrel	1 0 0 "	—	
Archangel.....	0 12 6 "	—	
Turpentine, American... per ton	22 7 6 "	22 12 6	



## LIST OF COMPETITIONS OPEN.

Sunderland—Technical School (£18,000 limit of cost)	£100, £50, £25	Fras M. Bowey, Town Clerk, Sunderland	Jan. 16
Cobham, Surrey—Sewerage and Sewage Disposal Schemes	25gs. (to merge in commission)	W. O. Reader, Clerk, Epsom R.D.C., Lonsdale, Epsom	" 16
Morley—Public Baths	£30 (merged), and £15	R. Borough Hopkins, Town Clerk, Morley	" 25
Sutton St. Edmund—School (100 places, £900)	No premium; 5 per cent., inc. com.	R. P. Mossop, Clerk to Sutton School Board, Holbeach	" 30
Worcester Corporation—Sewage Disposal	£160 and two lesser premiums	Samuel Southall, City Clerk, Worcester	" 31
St. Gilles, near Brussels—Town Hall (£12,000 limit of cost)	£10	Communal Authority, St. Gilles, Belgium	Feb. 1
Building Trades Exhibition Poster	No Premium	The Manager, 43, Essex-street, W.C.	" 1
Frizington—Public Offices, Wilson-terrace (£1,000 limit)	£10	John Bowly, Clerk, U.D. Council Offices, Frizington	" 1
Folkestone—Fifty Working-Class Houses, East Cliff	£50, £30	W. G. S. Harrison, Town Clerk, 4, Cheriton-place, Folkestone	" 13
Dudley—Grammar School and Master's House	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s.	Albert Morton, Clerk to Governors, 15, Birmingham-road, Dudley	" 15
Christiania—Railway Terminal Station Plans	£100 (merged in 4 per cent.), £50, £25	Railway Offices, 6, Victoria-terrace, Christiania	Mar. 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Washington Browne, A.R.S.A., Edinburgh, Assessor)	£20, £10	A. Macdonald, Town Clerk, Hillock House, Govan	" 31
Eccleshill, Bradford—Sewage Disposal	15gs.	Jos. Richardson, Clerk, U.D.C., 4, Town Hall-square, Bradford	"
Spalding—Extending Corn Exchange (£3,000 to £5,000 probable cost)	£150, in three premiums	H. H. Harvey, Clerk to Urban District Council, Spalding	"
London—Electric Omnibus and Cab Designs	£150 and £75	Sec. London Electric Omnibus Co., 6, Northumberland-av., W.C.	"
Auckland, New Zealand—Stock Exchange, Queen-street	£20, £10, £5	R. E. Isaacs, Secretary, 29, N.Z. Insurance Buildings, Auckland, N.Z.	"
Teddington—House Plans, Broom Water Estate	£50, £20	J. C. Hill, London Brick Co., 7, Archway-road, Upper Holloway	"
Bolton—Fire Station (£12,000 limit, local architects only)		E. Gudgeon Hinnell, Town Clerk, Bolton	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

Broad Hamston—Church Roof Restoration	Restoration Committee	Edmund Sedding, Architect, 12, Athenaeum-street, Bristol	Jan. 16
Morley—Bank Premises	London and Yorkshire Banking Co.	Wm. Bakewell, F.R.I.B.A., 23, Park-square, Leeds	" 16
Wyke—Additions to Infants' School	School Board	J. A. Walsh, Architect, Bank Chambers, Halifax	" 16
Alnwick—Choir Vestry at St. Paul's Church	Major Beecher	Forster and Paynter, Solicitors, Fenkle-street, Alnwick	" 16
Paisley—School in Carbrook-street, 800 places	School Board	Chas. Davidson, Architect, Terrace-buildings, Paisley	" 16
Wadebridge—Alterations, Govenna House	Corporation	The Proprietor, Wadebridge	" 18
Bedlington—Infants' School	School Board	James and Morgan, Architects, Charles-street Chambers, Cardiff	" 18
Birkenhead—Pavilion at Fever Hospital, Playbrick-hill	Corporation	Alfred Gill, Town Clerk, Birkenhead	" 18
Pontypool—Shops and Offices, Crane-street	School Board	Robert Williams, Architect, Osborne Chambers, Pontypool	" 18
Burnham-on-Crouch—Schools	Geo. Douglas	Fred. Chancellor, F.R.I.B.A., Chelmsford	" 18
Alnwick—Four Cottages at Christon-bank	Joint Sewage Board	M. Temple Wilson, Architect, 69, Narrowgate, Alnwick	" 18
Great Harwood—Manager's Cottage, Sewage Works		B. Haworth, Clerk, Palatine-buildings, Harwood, Bradford	" 18
Fleckney—Additions, Church Schools	Dr. S. W. Brook	The Vicarage, Fleckney, Leicestershire	" 18
Batley—Repairs to Properties	Board of Guardians	J. Fearnside and Sons, Printers, Commercial-street, Batley	" 18
Accrington—House and Surgery, Willows-lane		Hy. Ross, Architect, 15, Cannon-street, Accrington	" 18
Swindon—Additions to Laundry at Workhouse		W. H. Read, Corn Exchange, Swindon	" 18
Wakefield—Decoration and Electric Light, Wesleyan Chapel		W. and D. Thornton, Architects, 21, King-street, Wakefield	" 18
Pudsey—Two Shops and Houses, Somerset-road	Electrical Lighting Committee	G. D. Godsall, 31, St. Matthias-street, Leeds	" 18
New Brompton—Alterations, 137-9, High-street	School Board	Jas. Smart, the Celebro Co., New Brompton, Kent	" 19
Morley—Engine and Boiler Houses, Chimney, &c.	Admiralty	E. B. Hopkins, Town Clerk, Morley	" 19
Chapel-of-Garioch, N.B.—Public School		R. S. Wilson, Architect, 191a, Union-street, Aberdeen	" 19
Harwich—Coastguard Station Repairs		Director of Works, 21, Craven-street, W.C.	" 19
Paddington—Two Iron Fire-Escape Staircases, Workhouse	Paddington Board of Guardians	H. F. Aveling, Clerk, 289, Harrow-road, W.	" 19
Infirmary, Harrow-road	Co-operative Society	General Offices, Co-operative Society, Cleator Moor	" 19
Cleator Moor—Butchers' Premises	Pontypool Board of Guardians	E. Spickett, Clerk, Pontypool	" 19
Pontypool—Two Cottages at Llantwit Vardye	W. T. Lunley	H. B. Thorp, Architect, Goole	" 20
Goole—House, Boothferry-road		J. W. Grundy and Son, Architects, Brogden-street, Ulverston	" 20
Ulverston—Roofing-over Sun Hotel Yard	Westminster Board of Guardians	J. Berry, Architect, 9, Queen-street, Huddersfield	" 20
Rashcliffe—Six Houses, Victoria-road	Newport & Wellington School Board	Thomas and James, Architects, Port Talbot	" 20
Port Talbot—Two Shops and Houses, Station-street		Jos. Bond, Clerk, Poland-street, Oxford-street, W.	" 20
Wandsworth Common—Greenhouse and Pottery Shed, St. James's-road Schools		Robert Bruce, Clerk, South Cave, R.S.D.	" 21
South Cave—Infants' School	Admiralty Commissioners	John Kirk and Sons, Architects, Huddersfield	" 21
Skelmanthorpe—Engine House and Weaving Shed	Tynemouth School Board	S. Robinson, Architect, Cheapside, Bradford	" 21
Bradford—Villa at Lidget-green	County Property Association	Director of Admiralty Works, 21, Craven-street, W.C.	" 22
Dengemash, by Dungeness—Officers' House, Coastguard Station	Governors	Marshall and Dick, Architects, 4, Northumberland-st., Newcastle	" 22
North Shields—Coach-lane Schools	H. H. Watson	G. D. Oliver, F.R.I.B.A., Carlisle	" 22
Laithes, Penrith—Pair of Cottages		T. G. Abercrombie, Architect, 13, Gilmour-street, Paisley	" 22
Paisley—Technical School, George-street		T. A. Battery, Architect, Queen-street, Morley	" 22
Morley—Pair of Villas, Park-street	Dean and Chapter	A. Seward, Architect, 119a, Fishergate, Preston	" 23
Ribchester—Additions, Knowle-green School	District Board of Works	Fred. K. Bowker, Chapter Clerk, Winchester	" 25
Winchester—Converting Prefabulous House into Judge's Lodgings	West Ham School Board	W. H. Fairfield, Clerk, 117, High-street, Poplar	" 25
Poplar, E.—Refuse Destructor, Cart Sheds, &c.	H.M. Works Commissioners	E. J. Hammond, Architect, 111, High-street, New Brompton	" 25
New Brompton—Villa, Balmoral-road	London County Council	C. W. Carvell, Clerk, Broadway, Stratford	" 26
Stratford, E.—Whalebone-lane Schools	London County Council	Hon. Reginald B. Brett, 12, Whitehall-place, S.W.	" 26
Colchester—Enlargement, P.O. Sorting Office	Cheshire County Council	C. J. Stewart, Clerk, Spring-gardens, S.W.	" 26
North Woolwich—Fire Station	North Eastern Railway Co.	C. J. Stewart, Clerk, Spring-gardens, S.W.	" 26
Bethnal Green—Dwellings on Boundary-street Area	Gas and Coke Co.	H. Beswick, 17, Newgate-street, Chester	" 27
Runcorn—Alterations, Police Station	Board of Guardians	C. N. Wilkinson, Secretary, York	" 27
Darlington—Additions North-road Loco. Works		W. Robinson, Secretary, Long Buckby, Rugby	" 27
Long Buckby—Gasholder Tank	Egyptian Government	F. S. Chandler, Clerk, Odham, Hants	" 29
Winchfield—Additional Vacant Wards, Union House	London and Yorkshire Bank	Stronachs, Advocates, 20, Belmont-street, Aberdeen	" 29
Drumclog, Aberdeen—House on Sunnyside Farm	School Board	Le Société des Abbatoires, Belgrade, Roumania	" 31
Elgrade—Cold Store for Slaughter-house		Office, Ministry of Public Works, Cairo	Feb. 1
Cairo—Arabic Museum and Khedival Library		Wm. Bakewell, F.R.I.B.A., 38, Park-square, Leeds	" 1
Morley—Banking Premises		J. B. Morgan, Architect, Llanelly	" 1
Llanelly—School Board Offices, and Alterations, Two Schools		Leeming and Leeming, Architects, care of Royal Hotel, Oban	" 5
Isle of Rum, N.B.—Residence		J. Grindy and Sons, Architects, 12, Brazenose-street, Manchester	"
Whitefield, Lancs—Detached House, Church-lane		John Holt, C.E., 6, St. Mary's Gate, Manchester	"
Pendleton—Construction of Bowling Green	Barfield Bowling Club	Robert Tait, Erskine-place, Pumpherton, N.B.	"
East Calder, N.B.—Cottage and Stable		Wm. Holdridge, 5, Upper Accommodation-road, Leeds	"
Leeds—Eight Houses, Richmond Hill		J. C. Spivey, Architect, Old Park-road, Roundhay, Leeds	"
Leeds—House in Roundhay-road		H. H. & E. Cronk, Architects, 4, Mount Ephraim-rd., Tunbridge Wells	"
Tunbridge Wells—Houses in Vale Royal		E. Fearnly Bishopp, Architect, Ipswich	"
Thorndon, Suffolk—School at Kerrison Reformatory	School Board	A. N. Bromley, Architect, Queen-street, Nottingham	"
Nottingham—Re-erection, Dunkirk School	Greenwood and Littlewood	John Hutton, M.S.A., Kendal	"
Kendal—Stables and Coachhouse at Highgate		William Boyer, M.S.A., 10a, Cowgate, Peterborough	"
Peterborough—Two Houses, Broadway		F. H. Cooke, Surveyor, Priestgate, Peterborough	"
Peterborough—75 Houses	Keeble Brothers	C. and L. Owen, Architects, 104, Commercial-street, Dunlee	"
Dundee—Pearl Assurance Buildings		Musgrave and Peacock, Architects, 46, Wind-street, Swansea	"
Port Talbot—Four Shops		Jos. F. Walsh, Architect, Bank Chambers, Halifax	"
Lightcliffe, Halifax—Residence and Stabling		P. Falgrave and Co., Architects, 12, Victoria-street, S.W.	"
Hampstead—Residential Flats		H. Hardaker, Architect, Ivegate Chambers, Bradford	"
Manningham, Bradford—Converting Four Houses into Shops		Jno. Haggas, Architect, North-street, Keighley	"
Keighley—Congregational School-Chapel, Fell-lane		107, Lonsdale-street, Bradford	"
Bradford—House and Stable	Rogers, Ltd., Bristol	Jones, Richards, and Budgen, Architects, St. Mary-street, Cardiff	"
Cardiff—Rebuilding 1, Adam-street		Baker and May, Architects, Head-street, Colchester	"
Colchester—Two Houses, Cretfield-road	Crown Brewery Co.	C. H. Openshaw, Architect, Fleet-street, Bury, Lancs	"
Heywood—Rebuilding Dressers' Arms	Committee of Managers	Proprietor, Linnet-street, Keighley, Yorks	"
Keighley—Eleven Houses		J. R. Veal and Son, Architects, Wolverhampton	"
Edmond. Salop—Mixed School (160 places)	Dr. Moore	J. H. Burton, Architect, 2, Guide-lane, Hooley Hill	"
Andersham—Extensions, Leather Dressing Works	J. White	H. Harper, Architect, 8, Beest Market-hill, Nottingham	"
Nottingham—Two Shops		H. Harper, Architect, 8, Beest Market-hill, Nottingham	"
Nottingham—Additions to Hockley Chapel		C. F. Wilkinson, Architect, 35, Park-square, Leeds	"
Holbeck, Leeds—House in Doncaster-street		G. Bath, F.R.I.B.A., Salisbury	"
Wilton—Alterations, Business Premises, North-street		F. W. Moore, Architect, Albert-road, Withington	"
Widgington, Manchester—62 Cottages		J. K. Cole, Architect, 17, Hart-street, Bloomsbury	"
Purley—Wing to Warehousemen's Schools		F. W. Dixon, Architect, Trevelyan Buildings, Manchester	"
Osgodby, Market Rasen—Wesleyan Chapel		Hitchon and Pritchard, Architects, Manchester-road, Bromley	"
Padiham—Liberal Club	Committee	J. W. Morris, Secretary, 9, Castle-street, Swansea	"
Swansea—Operating Theatre at Hospital			"



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### BUILDING EXPEDIENTS.

ONE of the important differences which separate ancient from modern building is the development of the arts of strengthening, restoring, and repairing. Though the ancients were skilled constructors and rearers of edifices of great magnitude and consummate art, they were not apparently adepts in those expedients which the modern builder is master of. Where they restored or added to their buildings, they pulled down and rebuilt or strengthened from without by means of additional masonry in the shape of piers and buttresses, the old and decayed work sometimes, as at Winchester under the great William of Wykeham, incasing the Norman piers, and giving them additional bearing power, adding, at the same time, grace and lightness to the ponderous piers and arcades. At other times they strengthened the masonry with buttresses, or built relieving and inverted arches.

It is reserved, for our own times to make use of various methods of a less cumbrous and costly kind—not often, it is true, very artistic or satisfactory—*e.g.*, in the insertion of iron ties and bands which have disfigured and, in some cases, helped to destroy, the masonry, as in the ironwork introduced at Salisbury and other cathedrals. Nevertheless, the use of ironwork as a means of holding together a decayed and rotten pier, or of preventing the thrust of a spire or an arch, has been great, and if our predecessors had known as much as we do now of the great value of iron, and its application to masonry, and protection from corrosion, we should have been spared a few of the costly repairs that have been undertaken. There would have been less iron inserted into the body of masonry, for one thing, and a larger use made of Portland cement concrete, and careful shoring and underpinning. It is impossible to say how much injury and destruction have been caused to our great monuments by the ignorance of methods of strengthening foundations and repairing masonry that are known to us which, if taken advantage of in time, would have spared the present generation the pain, but necessity, of rebuilding, under the name of “restoration,” many of our great cathedrals and churches. What has been expended during the past forty years for this purpose alone has been enormous, and would have been sufficient to have built and endowed hundreds of new churches. We believe that a great expenditure in repair of old structures might have been avoided if due precautions had been devised to examine and secure the foundations. But fifty years ago the process of underpinning was scarcely known. Even the west front of Peterborough, which has been the cause of so much controversy, might have been spared, except those necessary repairs to the face stone-work.

Architects have to learn something from the important underpinning operations which are carried on in the cities of New York and Chicago. In these cities the extreme height of buildings and the yielding nature of the soil, often rendered very unreliable by the presence of water, renders it necessary to resort to costly methods of foundations, and to put in place rows of caissons by means of the plenum pneumatic process, to carry the lines of walls and central row of columns. Our readers have been lately made familiar with some of the methods used, and we recently referred to a mode of

underpinning that is at least ingenious and practicable when adjacent buildings have to be dealt with. In London, and all crowded cities, one of the chief difficulties is the support of the adjoining premises when deep foundations have to be laid—a fact which is well known to the contractor, who is held responsible for any damage that may result from his excavations. In these circumstances, the method adopted by Mr. Jules Breuchaud, Am.Soc.C.E., in connection with the Commercial Cable Building, Broad-street, New York City, is at least deserving of attention. The plan followed was briefly to insert a number of iron pipes or hollow columns in sections into slits cut into the adjacent walls that had to be underpinned; these sections were screwed together in lengths of about 5ft., and forced down by means of a jack acting between blocking on the top of column and iron beams introduced in the wall at the top of the slit. By “alternate jacking and blocking,” these pipes were pushed down to the solid rock, thus forming a continuous line of iron piles, though it may be of varying depths, upon which the old walls rested on either side of the site of the new building. By this simple method of introducing iron supports between the base of a wall and the foundations at a lower level, the ordinary underpinning operations by means of brickwork on cement were superseded. All the “pipes” were afterwards filled with Portland cement concrete. The author says the method has succeeded, and no movement has taken place since the sinking of the pipes. For narrow town sites bounded by lofty buildings, where deep basements have to be excavated for, this method seems to be likely to be useful, and it has already been employed for the support of other buildings in New York. Of course, in ordinary cases the side walls have to be supported by timber shores while the excavations are being made for the new building; but in narrow sites it is often impracticable to use shoring without interfering with the area necessary for the operations of sinking caissons, &c. The iron column underpinning enables the whole area to be kept intact for such work. In one case where the same method was adopted it was found that the “hard pan” arrested the pipe sinking. It could not be displaced by the “jet” process, and therefore the pipes were made of cast iron, 28in. diameter, large enough to enable a man to go down and excavate the hard soil under the edge of the pipe, and to remove boulders that might be in the way, and to otherwise wedge the bottom of the pipe on the rock bottom. These operations had to be performed by the aid of compressed air owing to the presence of water. We are told the foundations of the Stock Exchange, New York, were supported by pipes in this manner. As most of our practical readers know the ordinary mode of underpinning buildings is to remove bit by bit the defective masonry, reinserting new hard brickwork or stone set in Portland cement and sand, each course securely wedged and pinned into the work. In this process the success of the work depends largely on the thoroughness with which it is done, and especially on the shoring or cradling of the superstructure, the weight of which should be relieved as much as possible by needles. As the process is really the putting in of a new foundation, the support provided is the most important consideration. The space of the old wall removed at a time should be small, 2ft. to 4ft. in length, according to the condition of the masonry and height of building. In some cases granite piers or hard brick are introduced about every 3ft. or 4ft. if the height to be underpinned is not more than about 5ft., and these piers should be constructed with cement mortar, the space between old and new being wedged up with slate or steel

wedges. Between these piers of hard material the wall is then underpinned, the shores being removed as the work proceeds along. In Chicago steel needles are introduced to support the side walls of old buildings when tall office buildings are erected. These are placed about 2ft. apart, their ends being supported on long beams parallel with the wall, and supported by jack-screws. The absolute necessity of supporting the old work is scarcely so much insisted upon by architects as it ought to be. Shoring and cradling the superstructure so that the foundations may be relieved of any extra weight, is the first thing to be done. If there are arches like those of Peterborough west front, centres should be placed under them, so that the whole of the spandrelling above may be carried. A solid and continuous wall offers far less risk than one pierced by arch openings.

The new problem of raising structures to a great height without any great increase of wall thickness has called for novel expedients. Steel has to a large extent met the difficulty which was raised by some architects. They contended, with reason, that the height of buildings in London and elsewhere must be limited by the possible thickness of masonry walls, as their thickness at the bottom would occupy too much ground if the altitude of walls was increased beyond a certain limit. But the “steel skeleton” has taken away this objection. It is now possible to build to a height of 300ft. or 400ft. by using steel. We should be sorry to see the experiment tried in London or any of our large towns; but theoretically the question has an interest. Mr. E. C. Shankland, M.Inst.C.E., read a paper the other day at the Institution of Civil Engineers on steel construction in Chicago, in which he seemed to prove that such a system was almost a natural development of the condition of that city, which was largely confined by the lake, river, and railways, and had a very compressible soil. Thin walls, carried on a steel frame on isolated footings, were necessary. To a limited extent we use steel in our large commercial buildings, but there is something we may learn from the successes and failures of our Transatlantic brethren. We do not think what they have done in this direction commands our entire admiration. With thin walls it is impossible to obtain solidity of effect, and features like openings cannot be made architectural. At the same time, we must admit that steel construction, combined with other material for walling, has a future for certain kinds of building. In the Fisher (an 18-story) Building, it is said the live load made up of furniture, partitions, &c., was between 60lb. and 75lb. per square foot for the upper floors, and from 75lb. to 100lb. per square foot for the first and second floors, used for shops or banks. These loads would compare favourably with the loads of many of our brick buildings. We refer our readers to the paper for further details, the unit stresses for the H-beams, girders and columns, &c. When great loads can be carried on isolated iron columns, and when the means for connecting the different parts of the steel frame are perfected, it may become a question, in this matter-of-fact, commercial age, whether brick and stone will long survive for the construction of large commercial buildings and business blocks in our cities.

### MODERN ART CULTS.

IN many of the architectural designs of the present day, competitive and academical, we come across some strange and even waggish attempts, which their authors can only have submitted, it is thought, with the object of creating a little diversion, and not to seriously compete with others of very orthodox and ordinary kind. These works are often by men who have a “pronounced”



view of their art, who will not, even if they could, send anything of a conventional or stereotyped order. We see, perhaps, a design for a municipal building which looks something like a prison: it is all wall, bare and stern. Its author might have been inspired by the words of Ruskin, who says "Another fathom of outer wall is worth more than an army of pinnacles"; or it may be a design of a most irregular composition, in which every rule and formula has been set aside. To such men the

"Faultily faultless, icily regular, and splendidly null"

of Tennyson's verse is to be avoided at any price. So, as a natural reaction from an age of architectural purism and propriety, we have now a school of "cults." All kinds of irregularities and eccentricities are made the subject of special admiration and study. At one time it was the fashion to design buildings of studied symmetry and regularity, not only Greek and Italian, but Gothic as well. A well-balanced façade was considered the most dignified and elegant, it is now regarded by some with disrespect. A symmetrically disposed façade is almost looked upon as commonplace, if not vulgar. No doubt there were many architects who, in their endeavour to make one half of a building reflect the other, imitated the Italian garden satirised by the poet, and made architecture ridiculous in the eyes of many people, who could not see why the kitchen and pantry or stables should be made to balance a state drawing-room on the other side of the portico, or what consistency there was in adorning the windows and exterior of inferior apartments with the architectural embellishments of the main reception-rooms. At other times a turret was repeated at each corner of a church or chapel where one would have sufficed. The love of duplication ran to the extreme of being ridiculous when to balance a staircase turret an octagonal corner was built out as a cupboard or lavatory at the corresponding corner of the building. These vagaries were not merely absurd, but expensive, and the exaggeration produced a reaction. It was soon followed by a revolt against symmetry and duality of feature in every form, which in its turn has led to the worship of the very opposite condition—eccentric arrangement of elevation. The Gothicists led the rebellion, and it has since gone on and spread to other schools, the Modern Renaissance in all its varied forms. A modern school or "cult" affects to admire the eccentric, the one-sided, even the crooked. Men like the late Mr. Street disliked anything approaching repetition, and he even varied the details of his great façade of the Law Courts towards Fleet-street in the flanking towers of the central hall and in the minor details. Difference and irregularity thus became to be admired—they were qualities that betokened invention and resource. And there is a school of architects and artists who delight in this particular "cult," and in all their designs they are never tired of emphasising the eccentric and the quaintly irregular. They will cruelly wound common susceptibilities by accentuating differences. The person who looks for harmony finds a discord in some monstrously uneven or disproportioned window or feature; a small loophole on one side of the entrance is ludicrously made to correspond with a wide circular-headed opening on the other side. Both on paper and in actual buildings there are evidences of this provoking disregard of the public taste. There is a right and a wrong in these extremes. It was absurd to make a constrained balance of features by introducing those that were not wanted, and it is equally wrong to make an irregularity for the sake of mere affectation. Right in these cases is to do what is natural, to honestly express the structure or plan. The correspondence of halves will, of course, always have a claim on the architect in

buildings in which size and dignity are to be considered. A one-sided arrangement would be an abortion. Indeed, to a well-ordered mind who has any perception of qualities which express certain emotions, the idea of equivalence or equipollence in such a work is necessary. All our great edifices, from the stately Parthenon to the noble fronts of Peterborough or Lincoln, proclaim the same principle, and not only in their great west fronts, but in their plan as well. But these are examples of buildings designed for one main purpose, in which the axial disposition is preserved. In those of several different apartments the idea of centrality is, of course, not so strong, and ought not to be enforced.

Again, there are many just now who, in rebelling against the extravagant ornateness and fidgety character of our buildings, find relief in that restful flatness of surface which many of our advanced artists strive after. In this desire an admiration almost amounting to fetish-like zeal has been shown towards bareness. Flat, bare walls, a featureless architecture, are rampant in some quarters. In not a few designs plain shadowless surfaces more suitable to a stucco treatment are met with; cornices and projecting mouldings are eliminated, and an almost archaic simplicity is dominant. In a sunless and rainy climate like our own this extreme reluctance to use external features appears an affectation. If we indulged in frescoes, mosaics, or sculptured relief, we might see a value in this treatment of our buildings; in a locality where granite is the only material, as in the North, there would be an excuse for making our walls plain, and in doing away with projections, cornices, and moulded details; but this is not altogether the reason. Sentiment comes in, and something more—a desire to emphasise it, to exalt simplicity into a virtue of the first degree. It is now erected into a "cult," for we find the blank surface an article of the creed of a large number of men who care not to distinguish where this quality should be used in the street façade, as well as in the rural cottage. To the teaching of Ruskin, who speaks of breadth and plainness as one of the "lamps of architecture," and who contrasts the "rude streets of Picardy" with the market towns of Kent, of the "shrivelled precision" and "minute misanthropy" of the modern town; who elsewhere speaks of the eyes of architects inured to "narrowness and slightness," so unaccustomed to deal with breadth and solidity, we must attribute in some measure this longing for blankness of surface after so much that was fidgety and restless. We all value reserve, nobody more than the true artist; we mean that restraint which in the midst of much temptation prevents the architect from spoiling his whole front or wall with unnecessary window openings, or breaking up its surface into panels and strips by meaningless bands and ornament, or dividing it up vertically by pilasters; which crowds two or three gables in a small front, or fritters away every bit of surface by sham timbers, as our Strand and Oxford-street and fashionable seaside towns testify; that restraint, we say, which knows where to stop, how much detail or ornament can be taken in at a time and assimilated, so to speak, by the eye, instead of being overglutted and satiated by it. Every bit of old-world architecture here and abroad shows us that this restraint was the valuable ally of the architect in those charming old French and Flemish street buildings, like that of the meat market of Ypres, where the rich blank tracery is relieved and set off by the plain walling of the front. Restraint was not exercised, it may be said, by the Florentine designers of such buildings as the Cathedral of Florence, where all is broken into panels and veneered with marble; or by the designer of the town hall of Louvain, where every part is exuberant with ornament. In the former the surfaces are

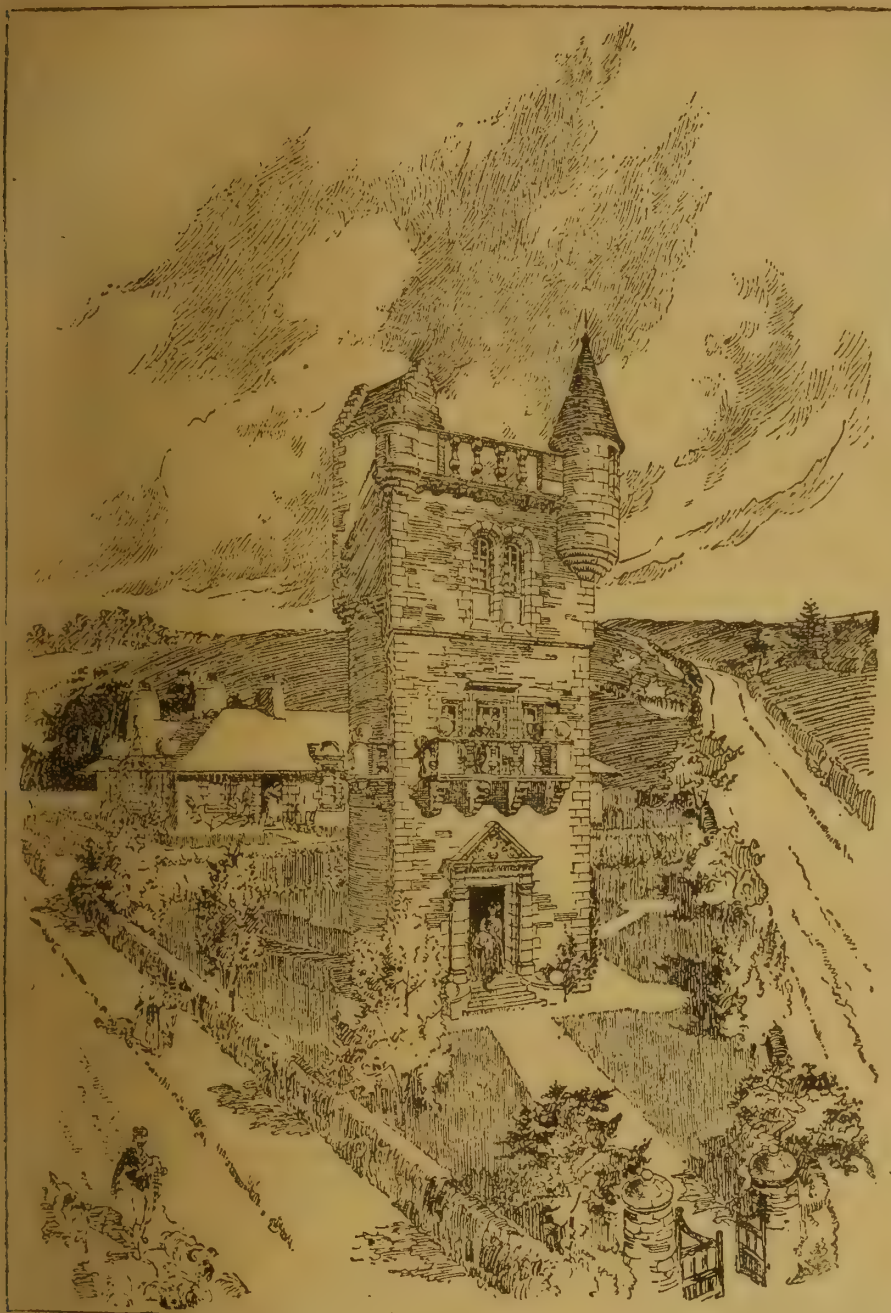
flatly treated, not broken up by projections, which makes the inlay of coloured marble tolerable, and like so much coloured decoration on a flat surface. The jambs and archivolts and bands are, in the main, flush with the surface. That there is a tendency on the part of some to carry this valuable quality of restraint to extremes cannot be denied; in moderation it is a healthful sign. Domestic design has benefited from it. Such a desire for "rest" in architecture as that shown by several designs in the last Royal Academy collection, some houses by Mr. Voysey, and also many of the works in the late Art and Crafts Exhibition indicate the development of this particular school.

Lastly, there is the "cult" of quaintness or singularity, which to a large extent is the emotional impulse to revert to the picturesque or the old-fashioned. It is really a throwing-off of the restraints of academical architecture. After so much that was unreal and falsely Classic, it was a healthful reaction; and, as in all reactions, there are always a few individuals who make it a cult—who, in fact, worship that very thing they at one time regarded with repugnance—so absurd are all extremists, whether in art or religion. That wave of romanticism which passed over Europe soon after classicalism in sentiment abated, which reached its greatest height during the pre-Raphaelite epoch, and in architecture brought about the Gothic Revival, led our architects to introduce a more natural and homely taste in domestic building. The resuscitation of the Tudor awakened, in its turn, the homely residences of the Stuarts and the Early Hanoverian manor-house style, with the adjuncts of the old dining-room, the ingle nooks, the large fireplace, the panelled ceiling, the small-paned window, two-panelled doors, and a score of other antique features which are a distinct protest against the stereotyped architecture of the day. But quaintness is valued for its own sake—it is no longer looked upon merely as something belonging to a past age style, but as a distinctive quality. What we call "quaint" was at one time commonplace, and the admirers of this cult desire to bring back the conditions of the art which gave rise to such design. It is here they differ from mere revivalists. Quaintness or oddness is looked upon as something to be admired—as a kind of art infinitely superior to modernism. The elements of irregularity, disparity, bareness, which we have been speaking of, may all be here found. In a quaint building, the very uniqueness of the arrangements of plan and feature, the disorder, the medley combination of bare wall and window, the picturesque skyline, the massive wall or mullion or sash-bar, the big baluster, the broken staircase, cosy corner, make it what it is—it is the very unlikeness of these things to modern architecture that provokes admiration. The cult of quaintness—exaggerated it may be—has done good in antidoting whatever is commonplace and stereotyped. The honest upholder of this school is by no means wedded to Mediæval art. He extends his admiration to all forms, Jacobean, Renaissance, and every style which at present is in use; his greatest abhorrence is machine production in any form in wood or stone, stained glass, tilework, tapestry, bookbinding, metal-work, and every other industry in which the position of the workman can be lifted from being a mere machine to an intelligent worker.

#### NATIONAL BURNS MEMORIAL AND COTTAGE HOME, MAUCHLINE, N.B.

THE foundation-stone of the above was laid last July with Masonic honours. The site is between Mauchline and Mossiel, and the tower, when finished, will command a magnificent view of the surrounding country so associated with the poet, the north-west side overlooking the fields which Burns tilled, and contiguous to





FINAL SKETCH OF THE  
BURNS MEMORIAL AND COTTAGE HOMES  
AT MAUCHLINE.

Mossiel Farm, where he worked. Underneath the tower will be a hall or museum where relics of Burns and others may be kept. The cottages will comprise single and double apartments for the housing of those in broken fortunes—the single apartments for single people; the double for a widow and young family, or an old labourer and his wife. Mr. Wm. Fraser is the architect, and Mr. Thomas Killin, of Glasgow, is one of the general treasurers to the memorial fund.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual meeting for the presentation of the medals and prizes gained in competition by the students of the Institute took place on Monday evening. Professor George Aitchison, A.R.A., the President, occupied the chair.

THE LATE MR. DAVID BRANDON, F.S.A.

Mr. FREDERICK WARREN gave a brief obituary notice of the late Mr. David Brandon, for several years past the senior Fellow of the Institute, who died, as we mentioned in our last issue, on the 10th inst., aged 83 years. Mr. Warren men-

tioned that in 1828, at the age of fifteen, David Brandon was articled to George Smith, of Mercers' Hall, and becoming a student of the Royal Academy a few years later, was successful in 1832 in winning the Academy silver medal for drawings of the Bank of England. He was awarded a bronze medal at the First International Exhibition of 1851. He designed and carried out more than thirty mansions in various parts of the country, and many other buildings, including the premises, now vacant, erected for the Provident Savings Bank in Trafalgar-square. During his 48 years' practice, many men, afterwards distinguished in the profession, passed through his office, of which Mr. Warren particularised Mr. Charles Dupré Smith, now retired from practice, and Mr. Charles John Porter, for a quarter of a century the essence of Mr. Brandon's office. In character Mr. Brandon was modest and energetic. Mr. Warren announced that he had bequeathed £1,000 to the funds of the Institute to be employed "for the advancement of architecture"—a statement received with manifest gratification.

The PRESIDENT, in expressing the pleasure with which this bequest would be received, remarked that their late friend was a most amiable and polite gentleman, and one who was willing

to do his utmost for the furtherance of the interests of that Institute.

#### PRESENTATION TO MR. ARTHUR CATES.

Mr. ALFRED WATERHOUSE, R.A., LL.D., who was received with applause, said he had been asked to present, on behalf of the past and present members of the Board of Examiners, to their friend, Mr. Arthur Cates, the late chairman of the board, a silver bowl, as a slight token of the esteem in which he personally, as well as his self-denying labours on behalf of the examination movement and Institute, was regarded. That the Institute examinations had become a serious undertaking would be seen from the fact that up to the present time 730 candidates had passed the examinations, while no fewer than 1,086 students were now engaged in preparing for the three stages of that series of tests. It was significant that in the days of the former voluntary examination, between 1863 and 1881 only 43 passed the tests, whereas, since the obligatory examination came into force in 1882, 737 had passed, and, as he had just said, a far larger number were pursuing their studies, not only in London, but in every part of the kingdom, and even in distant connections of the empire, and the invitation to come forward was being responded to with enthusiasm. The burden of the work of preparing for these examinations had rested on several shoulders; but the ones which bore the greatest load, and were certainly best able to sustain it, were those of their friend, Arthur Cates, who first worked in the matter in 1855, became identified with the Board of Examiners in 1877, and in 1882, when the examination became obligatory, was appointed chairman, a position he retained till his retirement last year, when for prudential reasons his health seemed to demand it. His tact, courtesy, and sympathy with the students had been most conspicuous, and those who had been relegated back to their studies had returned to thank Mr. Cates for the manner in which he had treated them, and had come forward at a later period better equipped. Having referred to the fact that in the examinations no one school or style of architecture had been favoured, and that thus the fears entertained some years since as to the effects of an examination in design had been allayed, Mr. Waterhouse formally presented the silver bowl—a large one with openwork edge—expressing a hope that Mr. Cates would be spared for many years to come to witness with satisfaction the development of the examination system in which he had taken so long and so deep an interest.

Mr. CATES, who was most cordially received, and who spoke in a very low voice and evidently under the influence of strong emotion, acknowledged the presentation, adding that the kind, very graceful words of Mr. Waterhouse had added much to the value of the handsome gift. He had not stood alone; the members of the Board of Examiners were all busy men, and devoted an immense time and labour to the promotion of the scheme. They had endeavoured to raise the standard of the examinations, and in this they had been successful. At the present day, courses of study in express preparation for the examinations were being promoted not only in London, but in Manchester, Liverpool, Newcastle, and other large provincial centres. The result of the institution of the compulsory examinations had been evident in the great advance of knowledge shown by students and the marked improvement of the profession. Mr. Cates proceeded to contrast the state of education in the profession now and when he entered the profession fifty years ago. Then, the term of pupilage had recently been reduced from seven years to five, and pupils were too generally left to work if they chose, and to pick up what knowledge they could. Lectures on architecture were given at King's College and University College, the latter by Professor T. L. Donaldson; a life school was established in Madox-street, while at the Royal Academy there was then an antique school, but no system of instruction. In 1855, as a result of a memorial from the Architectural Association, an examination was instituted, which was strengthened and systematised in 1861, and had since developed until they had at last realised the object of the memorial. Not only in England, but in other countries the advance of architectural education had been marked of late years, and especially was this the case in the United States, where courses of instruction for architectural students had been



instituted by Professors Babcock, Ware, and others. He claimed that the board of examiners had avoided the danger of influencing students in favour of one style, and that there had been no attempt to cram. The result of the examinations had been to raise the standard of education in London and all over the country. Mr. Cates's address was greeted by long and hearty rounds of applause.

#### PRESIDENTIAL ADDRESS TO STUDENTS.

The President then proceeded to deliver the prizes in accordance with the list published by us last week (p. 80), prefacing the presentation by an address. He remarked that possibly it was the laudable ambition of some of them to take one of the great architectural geniuses as a pattern; but they should have common sense enough to review calmly and dispassionately their own powers and capacities before entering on a serious attempt to imitate his achievements. A matter which seemed to him of the greatest importance was the recognition by students and their teachers that architecture was a structural art. Until that fact was realised and acted upon, no great improvement was likely to take place. They would all admit, too, that without proportion buildings and their parts were unsightly. They should endeavour to train the eye to good proportion by studying Classical buildings, but their proportion, however, only gave the statical results earned by experience at the time the buildings were erected, and if those studies were pursued too long they were apt to make the student fall in love with a state of knowledge inferior to that which was now possessed. His opinion was that the influence of the age was one of the most important subjects which could be mentioned to young architects. In one direction it was what was called the taste of the nation, and it invariably modified the individual taste of the artist. An old proverb said, "The mind of man is greedy for novelty," and novelty of taste had no doubt a certain charm. It showed them, too, how ridiculous antiquarianism was when it took the place of architecture. They were not Greeks, Romans, or Byzantines; the age was not Romanesque nor Gothic, and if the architecture of the age was to charm the age, it must discover and embody the desires of the age. The paraphrasing of deceased styles only charmed them in so far as their civilisation approached that of the date of the buildings paraphrased, and the buildings wanted novelty too. The nation had lost all desire for art which was the embodiment of ideas, by which alone the bulk of the people could be taught. Now a little semi-scientific jargon, embodied in a newspaper paragraph or an Act of Parliament, was expected to fulfil the function of art, but any person of observation could see that it did not so. Architects could but slightly modify the desires of an age, as there were so many thousands of things, conditions, and influences that combined to mould public taste. All they could do was to have all the attainable knowledge and skill required for their art, and if invention in architecture was extinct, they must try to recreate it. He could not help thinking that if a born architect could arise and be single-eyed in his devotion to this grand art, they might hope to see it again flourish as in the grand epochs of the past. Antiquarianism was not content with gnawing out the vitals of architecture, but was destroying their faith in its being still alive. Their great object was to be sure that they had done their best to learn all they had to learn. How delightful it would be if they were as sure of their progress as were the Gothic architects! If the Institute wanted to start this work of fundamental improvement, it would see that its examinations were not confined to students alone, but were to be passed by every one who joined it, and that everything that was not architectural was excluded from their examinations, and that those things alone were included which every architect ought to know to be worthy of the name. Any one could see that the arts of surgery and medicine had been enormously advanced since surgeons and doctors had to pass a strict examination in those arts, and no sane person could suppose that if architects were required to show that their knowledge rested on the solid foundation of science and esthetics, architecture would not rapidly progress.

The proceedings closed with some critical observations by Mr. W. M. FAWCETT, M.A., Cambridge, on the designs and drawings that had been submitted, in which he pointed out the weak and strong features in each composition.

#### THE ARCHITECTURAL ASSOCIATION.

THE fortnightly sessional meetings of the Architectural Association were resumed on Friday evening at 9, Conduit-street, W., the President, Mr. Beresford Pite, F.R.I.B.A., in the chair. The following four new members were elected: E. F. M. Elms, S. H. Evans, W. V. Morgan, and A. W. Waddington.

#### DECORATIVE PLASTER-WORK.

The following paper on this subject, illustrated by actual examples, working drawings, and sketches and photographs of executed works, was read by Mr. E. PRIOLEAU WARREN.

Among the subsidiary arts with which the architect has to deal there are few of more general application or importance than that of the plasterer. So much of our construction nowadays is of necessity concealed, and plaster is so handy a means of concealment, and indeed, when rightly used, so excellent a one, that its use in the interiors of buildings is inevitable. It is a material so sympathetic and lending itself so easily to decorative treatment and the repetition of ornamental design, that a vast amount of decorative plaster-work—good, bad, and indifferent, and I fear the last two adjectives are fully entitled to qualify two-thirds of the work—is being daily done. There is none of us who can well escape its use even if he wishes to do so. It, therefore, behoves all of us who have to do with building and decorating to consider and to learn what can and should, or what cannot and should not, be done with plaster-work; and it is much more with a desire to direct the attention of the younger members of my audience to some of its uses and abuses, than with any hope or intention of giving technical instruction, that I venture to appear before you. One of the first considerations that borders the subject of plaster-work is that of its fatal facility—which constitutes a great decorative danger. Its comparative cheapness, its possibilities of rapid workmanship, and the endless and easy opportunities of reproduction that it affords—in a word, its immunity from the natural and powerful restraints that cost and structural necessities impose in most other building materials—seem to me in the case of plaster-work to render self-imposed restraint and careful discrimination more than ever necessary to the designer. We are all of us, unhappily, familiar with the incontinent cornices of amazing horticultural suggestion with their basketwork and lattices, their vines and passion-flowers insecurely supported by internal wires, which bedecked the chief chambers of our fathers. We all know, and none of us, I hope, love, the weirdly confectioned "centre flower" with dependent "gasalier" that formed the cherished ceiling ornament of the British householder in the fifties, the sixties, and even the seventies, and dropped, in intermittent fragments, into his tea-cup or his soup-tureen. So fearfully and wonderfully made, so all-permeating were those adornments, that they begat a natural nausea in time, a nausea that—as often happens in such cases—communicated itself in mental connection to the innocent material that they vulgarised, causing sober folk to forswear ornament of any kind in plaster-work, to find a safe and wholesome refuge in absolute negation, absolute plainness. This was, of course, only a partial revulsion, and was accompanied or followed by "revivals," as they are called, of many types in plaster-work, as in all architectural design. The beautiful ceilings and friezes of the 17th century, which made our country famous for its plaster-work, were studied to good purpose by the very few, to evil by the very many, and "Elizabethan" and "Jacobean" travesties became nearly as rife and rampant as the exuberances of the centre-flower period. "Revivals" of Italian, French, Saracenic, indeed, of all and every bygone manner, have been practised, and there are many eminent plaster-shops where you can buy a "reach-me-down" design in imitation, superficially correct, of any style you please, at so much—the term is apt—"per superficial foot." These things have had a great vogue with the uninstructed. They please because they offer a romantic suggestion of a possibly romantic original, or of the manorial or seigneurial appurtenances of romantic fiction; a suggestion only, for even as copies they are poor, with their dead level floated grounds, their railway-line rigidity of "run" mouldings, their sharp arrises, and mechanical "repeats." What a contrast they offer to the

originals they travesty. Anyone who examines, with eyes of discernment, a good 17th century English ceiling, will see that, beautiful as the plan of design and forms of ornament may be in themselves, they only count for a portion of the total sum of beauty. The hand of time, and recurrent coats of whitewash, have often done much in contribution of effect; but the intrinsic, ineffable, underlying charm of handiwork, of human pleasure and interest, of "handling" is there. The plain surfaces are not hard and level, they are full of slight undulations, the ribs or "strap work" have no mechanical rigidity, they are by no means accurate at their intersections, they are softly and pleasantly moulded, and usually undulate somewhat with the uneven surface of the ceiling. The ornamental foliations—bosses, roses, and the like—when they repeat, do not do so with regimental exactitude; awkward corners caused by irregular wall lines, chimney breasts, &c., are lightly and nonchalantly dealt with; there is no strained attempt at fit, begotten of the drawing-board; the design is curtailed, expanded, chopped off, or twisted to meet the emergency in a manner that would look queer on a smart office drawing, but is delightful in reality. Experts differ very much as to the methods of preparing the plaster used for these old ceilings, and as to the way in which they were put up. It is, of course, well known that some were rendered in lathing, some on rough withies, and some on reeds or rushes. It is obvious that casting was employed in many instances for the ornamental foliations and bosses, and it is stated that a sort of stamp or pressing-mould was employed for repeating ornaments of small size, such as the roses in the beautiful ceiling at Chastleton, one or two of which I was able to examine closely, as they had fallen down. They certainly seemed to me to have been squeezed into a mould. There are many indications that a good deal of the rib-work was formed by pressing into the plaster ceiling, while still damp, lengths of rib in a similar damp condition. One finds awkward joins and curious failures to fit to a centre, in the case of radiating ribs, which warrant that idea. If you examine a fallen bit of plaster from one of these old ceilings you will generally find it very thick and coarse—often very earthy, and sometimes full of little bits of gravel, &c., the kind of stuff the conscientious architect would have to condemn. But its very coarseness helped the effect of the plain surfaces by giving them texture, a quality we so often miss nowadays. How the elaborate and complicated ceilings were designed and set out we do not know with certainty; but there was probably a rough plan, which was all that a well-skilled workman needed—he had his tools, his models, and his traditions. That he had models of ornaments for ceilings and friezes we know, as we find exact repetition not only in different rooms of the same house, but in different houses. And you will often find ornamental designs obviously intended for a ceiling formed into a frieze, or used to decorate the spandrels left between the horizontal frieze and the end of a vaulted ceiling, as in the library at Merton College, Oxford. It is probable, however, that much if not most of the decorative design was modelled *in situ* on the ceiling itself, partly with tools, partly with fingers. When fingers were used upon the actual plaster, it is obvious, as any plasterer will tell you, that the lime used cannot have been as sharp as that we use now; it must have been old or deadened, or no man's fingers would stand it. There are many lessons to be learned from the abundant examples, to be found in almost every county of England, of beautiful old plaster-work, while Scotland, Wales, and Ireland have their characteristic examples, and one of them is the extreme importance of plain surfaces of texture. I am glad to know that within the last few years that lesson has been taken to heart by one or two artists who have turned their attention to plaster-work. There were some striking instances of the fact in the work of Mr. Ernest Gimson at the last Arts and Crafts Exhibition; work full of charm and feeling, and quiet originality, and delightful in uneven surfaces, roughish texture, and broad unlaboured modelling—work as different in spirit from the average mechanical plaster-work of to-day as was that of the Elizabethan or Jacobean plasterer. I believe that the first essential of success in plaster-work of frieze or ceiling is the treatment of the ground. It will be difficult, but necessary, if we are to succeed, to wrest from the modern workman his



ideal of perfect even-floated and set levels, innocent of the faintest undulation as fresh thin snow over a sheet of ice—and looking just as cold and hard. It is amazing with what skill a good and conscientious plasterer, armed with his float and straight-edge, will arrive at that result. It is neat, it is smart, it is difficult to do, and he is proud of the achievement, and I don't blame him; he does well what is expected of him, and satisfies his conscience, we will hope. When his ceiling is to be sub-divided by ribs or decorated with ornament of any kind, he still appears to be ruled by the instinct for sharpness, hardness, and rigidity. He starts with a billiard-table surface, the ribs are "run" with a zinc mould *in situ*, or are cast in a "run" reverse mould and put up subsequently, the ornaments are cast from sharp feelingless models, and the work reaches a wonderful perfection of mechanical accuracy which, to the mind of an artist, is its glaring imperfection. The arrises are sharp as razors, the beads are round and smooth as glass tubes, a correspondence religiously exact is maintained on both sides of a centre line. The cornices are run as accurately, as mathematically as the rest, and the drawings and details are faithfully observed. The result is naturally as unsympathetic as the method. I speak of the average. I am well aware that, fortunately, there are exceptions—I am happy in believing that they are many, and the number seems likely to increase rapidly as architects increasingly devote more time and thought to what is one of the most interesting and important crafts amongst the many that they rule. What we need, it seems to me, to fit us for a more competent control of plaster-work—as of so many crafts, is to draw less and model more. Fortunately, within the last few years a good many sculptors of talent have turned their attention to decorative plaster-work, and beautiful ceilings, friezes, and panels in low relief stand to the credit of several men whose names are well known to you. There is an increasing demand for decorative work in plaster. People, even of moderate means, are no longer generally content with the blank white lids of the boxes they live in. This discontent is exemplified in many ways, one of them is that suburban joy, the patterned ceiling paper; other indications are the patent substitutes for modelled ceilings, whose illustrated catalogues, with their alluring titles, are lavished on the letter-box and waste-paper basket of every architect. A desire for decorative friezes is also prevalent, and is exemplified by precisely similar instances. If this discontent is responsible for many queer results and unlovely makeshifts, it is not in itself ignoble. It is our business to divert it into wholesome channels. The instinct to enrich the ceiling or the roof is, I think, a natural and an obvious one—the roof is surely as worthy of adornment as the walls. In a church or a great hall it is, or should be, the crown and glory of the whole scheme. In domestic work, in the home of the average comfortable Briton, the chief substitute for modelled plaster-work obtains a readier acceptance on account of the fact that we dwell—most of us—like hermit crabs, in other people's shells. The leasehold condition of our occupancy has begotten a leasehold type of decoration. The householder wants something that will "last my time, don't you know?"—or, at rate, suffice for seven, fourteen, or twenty-one years. So he not unnaturally shrinks from permanency, which implies cost, and he thinks the real thing costly; but as a matter of fact, it is by no means necessarily so. With care and thought, and a little ingenuity, it is possible to get good decorative results in plaster at small cost. There are many ways, for instance, of redeeming the absolute bareness of a plain plaster ceiling, without much expenditure. You can have a well-moulded cornice and divide your ceiling into plain panels by means of shallow ribs. At very little extra cost, if your design "repeats," you can put some simple little ornament into the panels. You can dispense with ribs, and have ornamental corner pieces and a centre; or you can have the general field plain, and have an ornamental border next the cornice, and modelled in low, broad relief. Where your conditions make it possible, and, I should say, in a longish room or corridor, you can drop the cornice a little way down the wall, and form your ceiling to a shallow curve. This may be delightful in itself, even if quite unrelieved, or can be very effectively decorated with light ribs at intervals and simple flattish ornaments. There is really no end to the simple and effective possibilities of very slightly decorated

ceilings. I have seen an old ceiling in a low room at Oxford which has four corner ornaments and a centre, very simply modelled in a highly conventionalised grape vine design—and it wants nothing more—but the plain surface is such as would horrify the skilled plasterer of to-day. The ceiling under an ordinary collar-rafter roof frequently gives a pleasant opportunity for plaster decoration. You can accept the splayed side between ceiling and cornice, and treat it as a sort of sloping frieze, ornamenting the flat under the collars more simply and sparsely, or you can fix out and form a curved or vaulted ceiling, as I have suggested before; and a vault is one of the most delightful fields for decoration. When cost is not a closely restricted consideration, the range of possibilities is wide—for ceiling, frieze, decorative panels on chimney breasts, or such-like positions, or for the treatment of the walls themselves. It is sometimes desirable—in a hall or a ball-room, for instance—to treat the walls with a permanent architectural decoration that precludes further adornment by means of pictures, wallpapers, or hangings, and this, if you use low relief and have a good protective base or dado, can well be done with plaster-work, by means of pilasters, decorated panelling, reliefs, &c. If pilasters are used, it is generally advisable to inclose the plaster relief in a wooden frame, for preservation's sake. Whatever the field of your decoration, it is necessary, of course, to use restraint, to avoid over-crowding and fussiness, to aim at a broad decorative result, to remember that you will cheapen your devices by over-repetition, and spoil your ornament by over-elaboration. The eye wants some unornamented spaces to rest upon. It seems to me in most cases wise to have rather plainly treated walls and a simple frieze, for instance, where your ceiling is elaborate, and a simple ceiling where you want an elaborate frieze. It is hardly necessary to say that your plaster work should be "plastering" in effect, round and soft, and should not imitate the treatment of any other material. The ceiling, frieze, panels, or whatsoever form the plaster work may take, should fall into the architectural scheme of the interior they contribute to—they must be in coherent relation to the rest. The scale must be preserved. And there are many considerations to be taken into account in designing a frieze or ceiling. The proportion of the room, of course, first. It is obvious that the same design would be inappropriate—in one instance, if applied to two rooms, one of which was 10ft. high and the other 20ft., and that a long, low room needs different ceiling treatment to a high square one. Then the lighting must be taken into account. Where the tops of the windows reach nearly to the ceiling, and especially where a longish room has such windows pretty evenly distributed along one side only, very delicate relief will tell at a considerable height. In the same room, if the windows are low, or so small as to give inadequate light, the relief will require to be bolder in order to tell. A room lit from two opposite sides, giving a strong cross light, is the most difficult to treat successfully. The cross light defeats the shadows and spoils the effect of relief; in such a room greater emphasis, greater sharpness of modelling is advisable. All these remarks are intended to apply to daylight effects; but artificial lighting should be considered, too. In great reception-rooms, chiefly used at nights, and in all rooms intended to be brilliantly lit—say, by electric light—it is well to keep the relief rather softer and more delicate than in rooms of more ordinary character in illumination. As a general rule, in an averagely-lighted room, up to 13ft. or 14ft. in height, the relief of ceiling mouldings or ornaments does not require very great projection if the ceiling is left white or nearly white, as relief looks exaggerated. Ribs, I think, are but rather broad and shallow in form, and with a tendency to round members rather than sharp-arrised ones. Their size, of course, must depend upon the scale of the room, the heights at which they occur, and the effect aimed at. Constructional beams dividing the length of a ceiling frequently help the design greatly, and are capable of very effective treatment in themselves. In many a splendid old ceiling the ornament was confined entirely to the beams and the cornice, with which they intersected. When there are no beams, I am personally inclined to prefer detachment between the decorative design of the ceiling and the cornice. I like a margin left along the cornice. This helps you if you wish to leave the ceiling whitish and to

colour the cornice; and, generally speaking, the cornice must be regarded as the crown of the wall and not as the beginning of the ceiling. However, that is, after all, a matter of design or circumstance; it is risky to generalise too freely. But it is safe to say that too much attention can not be bestowed, first, on the ground surface—whether of ceiling, frieze, or panel—and, second, on the modelling of any ornament, whether simple rib or foliated or arabesque design. If you cannot be sure of getting good modelling, have none at all; find safety in plainness. If you wish to avoid sharpness and hardness, have ribs and cornices modelled, not run. Keep them simple and broad, not liney and wiry. Generally speaking, I believe that for ceilings a more or less geometric basis for the leading lines gives the happiest effect; the arrangement should, at any rate, be ordered, if not formal. But whatever the basis and whatever the treatment, the design should essentially be a ceiling design, the ornamentation of a flat surface—to be seen from below—and in a room where it is intended to be seen from all points, it should "read," as it is called, in all directions equally well, though it may have a main longitudinal or lateral tendency. It is, perhaps, hardly necessary to counsel the avoidance of any obviously unsuitable type of design for a ceiling, such as swags and festoons—suitable, perhaps, on a vertical surface like a frieze, where the sense of vertical dependence is appropriate, but inappropriate and awkward in a ceiling. A frequently effective treatment for a tallish frieze is to have some form of ornament repeated at widish intervals, the interspaces being either quite plain or filled with a plain moulded panel. I have so far dealt with the consideration of plaster-work for the interiors of private houses. Great mansions and great civic buildings differ in degree rather than in kind from these, and, as regards their internal plaster work, the principles applicable to smaller buildings apply to them. Where deep-beamed and coffered ceilings are used, greater structural support is needed for them, and bolder modelling and moulding, of course, to preserve their relation in scale to their architecture. They often, however, present the decorative problem of the treatment of domes, of which in a civil building, I have not yet seen a strikingly original treatment in plaster-work. I have seen—you have all doubtless seen—dozens of domes treated with diminishing coffered panels, whose framework ascends on converging radial lines. Wren left us many fine instances of these. The dome of St. Stephen's, Walbrook, is, I think, the most beautiful instance I know. In this dome there are four tiers of diminishing coffer panels, the second above the cornice, and the final one having panels corresponding in width to two of the first and third. And, indeed, Wren's churches, and those of his pupils and immediate successors, provide an abundant field for study of a certain type of design in plaster-work, mannered and formal very often; but full of vigorous character and excellent workmanship. A great deal of the plaster work, which is by no means confined to the ceilings of our City churches is, of course, subject to the criticism of being in direct and purposeful imitation of Classical Italian models in stone and marble. The coffered soffits of the arches of St. Bride's, Fleet-street, of St. Katherine Cree, show this strongly, and it is observable that in St. Paul's Cathedral stone and plaster details are precisely of the same character. In St. Stephen's, Walbrook, there is much fine plaster-work beside the dome; there are light and narrow arch soffits with running patterns of roses, &c., and the transverse arches of the vaulted roof mark the plain vaulting bays—unrelieved except by a large centre boss—with a boldly-moulded band of convoluted foliage ornament. The churches of St. Mary Aldermay and St. Katherine Cree both have groined Gothic ceilings in plaster—very reprehensible theoretically, but distinctly picturesque. And at St. Mary's Aldermay the arch spandrels of the nave arcade are charmingly filled with coats of arms, and flowers, and fruit, &c.—a good instance of the effect of confining ornament, using it to give special emphasis to particular features of construction—the wall above the arches being perfectly plain. Christ Church, Newgate, shows a sparing use of plaster adornment. And the beautiful little interior of St. Anne and St. Agnes, Aldersgate, shows in its large decorative panel borders, its shallow arch cofferings, and the enriched soffits of its corner spaces, some graceful and delightful examples of this Anglo-Italian



Architectonic style of plaster-work. It has been reserved for the last few decades of this century, and the devotees of the "Gothic Revival," to find that plaster work is inappropriate to the interior of a church. In the 17th and 18th centuries, and until near the end of the first half of the 19th, plaster ceilings were the rule, and not the exception, in churches. A great many very charming ones have disappeared before the hand of the restorer, but several 17th and numberless 18th-century examples remain. I am glad to see that plaster-work is regaining its place in church interiors; it provides, at any rate, a pleasing variant to ceilings of stained or painted deal, or to open roofs with timbers of small scantling and wrought "die-square." For the enriched ceiling of sanctuary chancel or side chapel, I think it is a most excellent material; and the invention of fibrous plaster makes it possible, with little difficulty and comparatively small cost, to use enriched plaster-work, not only for ceilings, but for other decorative purposes in churches. The slabs of plaster which bear portions of the design, or completely fill separate panels, are put up like wood-work, and screwed to the rafters, or firing pieces, put to receive them. Each slab should be composed of thinish plaster, imbedding layers—usually two in number, I believe, of very wide-meshed canvas; the plaster being worked well through the meshes. They are stiffened with laths or battens, and can be worked to any required angle or curve. If the relief is not great, they are very light. Where a number of slabs have to be joined to form a ceiling, without intermediate ribs, it is customary to pack damp canvas between their meeting edges, which not only protects them, but forms a stiff setting when it dries; the fissures are subsequently pointed in with plaster. Brass screws should be used for fixing, and the screw-holes, of course, must be stopped in. If steel screws are used, the heads require to be coated with japan or paint to prevent the inevitable rust from staining the plaster. I put up a panelled ceiling of this kind over the sanctuary at Groombridge Church some two years ago. I believe that many of you have visited that building. In that case the panels were each in one slab, and their edges were clipped by the overlapping oak ribs and fillets. In my Church of St. Clement's, at Bradford, I had the good fortune to secure, for the decoration of the chancel roof, the services of Mr. George Frampton, who modelled the fibrous plaster ceiling, and of Mr. Anning Bell, who coloured it. In this case Mr. Frampton was first provided with a model, to a scale, I think, of one quarter full size, of one side of the coved inner roof. On this he modelled his first sketch, which with some other details of the ceiling, he afterwards exhibited at the Arts and Crafts Exhibition two years ago. He then set to work on a full-sized model of the eastern bay, and upon the repeating ornament of shields and rose-trees, and the frieze of cherubs that fill the rest of the ceiling. Casts were made from his models and were screwed up, joined, and stopped in the manner I have before described. The ridge, cornice, and vertical ribs are of deal, and are painted and gilded with the rest of the ceiling, which was dry and paintable within a day or two of fixing. The use of fibrous plaster enables one to escape the flatness and rigidity I have spoken of as due to floating surfaces and running mouldings. The casts bear the direct impression of the modeller's handling. The use of this material is not without its artistic dangers, the chief of which is that its modelling is not as a rule done upon the actual ceiling. It is possible, of course, to model *in situ*, and then cast from the models elsewhere, and that, I fancy, would be one of the safest ways in which to prepare the design of a fibrous ceiling, for nothing can quite come up to the actual position and the actual lighting of the building for which the work is destined. The next best method is to arrange your model in the workshop at as nearly as possible the height that the ultimate casting will occupy, approximating as far as possible the conditions of light and surroundings, and modelling the ceiling from below. If you cannot manage this, it is wise at least to get your model either conveyed to the site it is to occupy, or hoisted up in some similar position for your judgment of effect. It is essential, in case of a ceiling with a cornice and divided by plaster ribs, to have cornice and ribs cast from models also, not run. In the case of ribs, this can be efficiently done by casting a reverse from the first model, and pressing the clay into it, to form ribs for the model section of the

ceiling. The laying of the moist clay ribs into the ground surface of the model insures the avoidance of rigidity. I have said that it is impracticable to mould with the fingers the actual plaster so as to avoid casting altogether, unless that plaster differs very much from what we generally use. But that difference is now obtained, as I am told, by the use of old or deadened lime, and some special kind of sand, and ceilings and other decorative work are modelled in plaster and in position. That, it seems to me, must be the best plan possible when the object is to avoid repetition, and when cost admits of it; further, where exact repetition can be avoided, the better will be the result. The consideration of decorative plaster-work for the exterior of buildings is almost a subject by itself. As you know, a great use of it was made in certain districts—the Eastern counties especially—in the fifteenth, sixteenth, and seventeenth centuries. "Sparrow's" house at Ipswich is a striking instance of rather coarse and crude, but very picturesque, adornment. A good deal of external plaster work (using that term to cover work in cement and selenitic mortar) has been done, and is doing, in our time, as several of Mr. Norman Shaw's buildings testify. Until quite recent times the old traditional and delightful "stick-work" was done by village plasterers in rendered cottage fronts, but I fear that tradition has gone the way of many others. One suggestion I would make with regard to external work in low relief, is that the relief should be stronger on the north side of a building than on the others. I have now only a few words to say as to the treatment of finished internal plaster-work. When the plaster—fibrous or otherwise—is perfectly dry, it can be treated with a thin coating of wax dissolved in turpentine, wiped or rubbed here and there with a rag; this gives it a pleasant, soft, ivory-like appearance that is more agreeable than the even tint of distemper. (At Groombridge I had the shields and emblems entirely gilded, and then glazed over partially with thin oil colour, the whole of the remainder being waxed.) If heraldry is employed, the coats of arms must, of course, be coloured, or the blazonry is incomplete. There are some good instances of the effect of emblazoned coats occurring in a general field of toned white plaster in the cloisters of Corpus College, Oxford. It is a contrast of which I am fond, that of richly toned heraldry and toned white plaster work. In church work it is likely that colour over the whole surface of the work may be needed, and this presents no difficulties either in the case of oil colour or distemper; in the latter case the suction of the plaster will probably need to be stopped with a coat of priming. I referred just now to the effects of a cross light. In my opinion, a ceiling lit from both sides requires colour, and perhaps gilding, more imperatively than one lit from side or end only, when the relief gets its full value through shadows. Plaster reliefs may, of course, be readily used for decorating wall spaces or arch spandrels in churches. There is, in fact, no end to its decorative applicability. Time, and your patience, would fail me if I endeavoured to cover all the ground of my subject. You will notice that I have omitted all consideration of Sgraffito work and Scagliola, which certainly come under the head of decorative plaster-work. I did so advisedly, for the former subject alone would readily fill the limits of a paper like this. For similar reasons I have not treated of foreign work—Italian, French, Spanish, or Mauresque, European or Asiatic; the subject is really a tremendous one. If I have succeeded in arousing any interest or enthusiasm for a very attractive craft, I have realised the full intention of my paper.

Mr. L. A. SHUFFREY, in proposing a vote of thanks to the lecturer, remarked that he had not referred to the plaster-work of the Brothers Adam, much of which was exceedingly beautiful. The attempt to get a wavy or uneven ground in plaster-work would give the worker great trouble, but often a plain ground gave a very good effect. The speaker learned a very good tip from Mr. Stephen Webb, who when he had modelled the work on the ground, took a little piece of clay in his hand and worked away the material at the intersections of the pattern, removing a good deal of the roughness. The speaker laid stress on the value of the ground, and considered that many designs would be greatly improved if a great deal of the ornament were swept away—for example, the domed ceiling of the meeting-room in which they were assembled (the R.I.B.A. hall) would be

much better if it contained less ornament: the effect would be less confused, and the original cost would have been greatly reduced.

Mr. W. MILLAR, author of a recent book on plastering, said much of the work after Adam's period was not executed in plaster, but gypsum, and gave little opportunity to the plasterer, as was chiefly repeated from wood or metal moulds. Fibrous plaster was not so good a non-conductor of sound nor so fireproof as ordinary plaster. Fibrous plaster, although patented in the present century, was by no means a new material, for it was used in Egypt in ancient times. For ceilings it was very useful, especially for renovating old ceilings, and for theatrical decorations, as it lent itself to repetition and could be executed very rapidly.

Mr. HAMPDEN W. PRATT, in seconding the vote of thanks, observed that he was surprised to find the speculative builder so conservative in his plaster-work, especially in his adherence in centre flowers screwed up to the ceiling. The modelling of plaster to suit the lighting of corners was exceedingly difficult, especially when the use of natural and artificial light had to be considered. The electric light brought out ceiling ornamentation into very sharp relief, and, therefore, arched should not be left too acute. He agreed with the lecturer, that the hanging of swags on a flat wall was absurd, notwithstanding the abundant and ancient precedents which could be quoted for the practice. Where the ceiling was panelled, the cornice had to be worked into the design; but a much better plan was to treat the cornice as the crown of wall, especially where a frieze was introduced below it. The designer of plaster needed to study reserve, for the temptation to over-ornamentation was very great.

The vote of thanks having been heartily accorded, Mr. WARREN briefly replied.

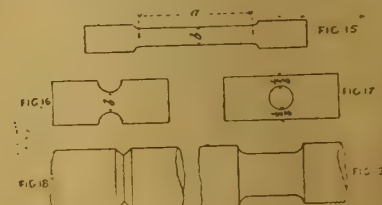
#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—VIII.

THAT the form of test-pieces must be considered when estimating the value of experiments is borne out by many investigations.



FIG. 14.

Many of these might seem to have had little direct bearing on practical work; yet, both directly and indirectly, they are of great value, because they tell the practical man the drift of certain methods and details often otherwise of apparently slight moment. Thus it might seem a small matter whether a specimen were very long or very short, whether adjacent dimensions were of approximately the same or of different areas; whether holes were punched, or drilled, or recesses cut out, whether edges are jagged or smooth, provided that a given net area of section were made the subject of experiment. Yet these



differences do produce very important results, which could not have been anticipated without careful experimenting, and these investigations are bearing good fruit in improved modern practice. Very much can be gathered from the lessons taught by the extension of variously-formed test-pieces and the manner of their fracture—a subject which may be suitably condensed here.

The extension of a test-piece when pulled asunder is comprised in two portions—the general and the local extensions. The first occurs over the whole length between the gauge points, and corresponds roughly with the maximum load. The second, termed "drawing out," denotes that portion of the elongation which is of a very local nature, occurring only at, and in the vicinity of the point of rupture. "Contraction



of area" denotes the reduction of area which takes place at the area of fracture; it, like the elongation, is a measure of the ductility of the material in a test-piece. The last is not usually embodied in specifications, the former always is.

The extension of any bar is, more or less, irregular, if measured on successive short lengths divided out on it; but it is always least near the ends, and greatest in the immediate vicinity of the section of rupture. The total general extension continues until the maximum effect of the load takes place, and nearly to the moment of rupture. Then local contraction sets in. The relations between the two vary from zero in crystalline materials to a very large proportion in the most ductile materials. Being compounded of two factors, general extension and local extension, these are taken as one in giving the results of tests. Obviously it follows that a short test-piece in

FIG. 20.

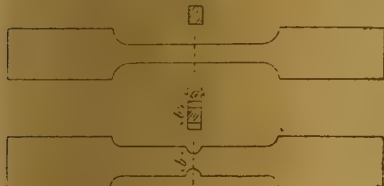


FIG. 21.

which the extension is almost wholly local will give a higher percentage rate of elongation, calculated on its length, than a longer test-piece in which the extension is mainly of a general character. The general elongation is proportional to the length of the test-piece, the local elongation bears no proportion to the length of any but a very short piece; for this reason it is always necessary to state the lengths of test-pieces in order to afford a measure of comparison with other test-pieces. If, however, the local extension is deducted from the general extension, then there will be no difference in the readings of bars of different lengths; hence it has been proposed to discard the local extension altogether, and to measure the general extension only. This, however, would be so much more difficult that it is not likely to be adopted. Differences, due to want of uniformity

FIG. 22.

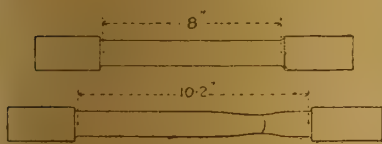


FIG. 23.

in respect of homogeneity and of ductility, are seen in the testing of specimens, and this is quite apart from the local drawing out which occurs in the vicinity of fracture. Specimens do not elongate uniformly, but with more or less of irregularity; that is, if a bar is divided into unit lengths, the percentages of extension will vary in nearly every length. The irregularity is seen in the specimen,

FIG. 26.

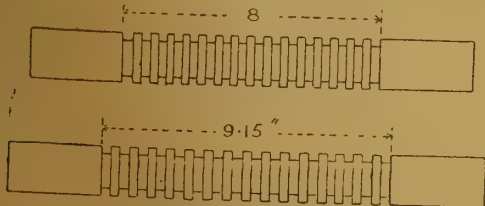


FIG. 27.

Fig. 14, which was marked out in equal divisions previous to testing. The want of uniformity observed points to two reasons in explanation of that fact. The stretching in successive equal sections being irregular and variable suggests that the material is most likely non-homogeneous; but another and more important reason lies probably in the increase in tensile strength due to drawing out, whereby a portion slightly extended will not extend more until an unextended portion else-

where has yielded a little:—this accords with observation and experiment, of which further note will be made immediately. When local contraction sets in, the maximum tensile strength measured on the original area of the bar diminishes, so that at the moment of rupture the strength is always less, frequently two or three tons less, than the maximum; but the contraction of area increases then more rapidly than the strain, indicating increase in strength due to drawing out, so that drawing out results in actual increase of strength, the stress per square inch of reduced cross-section increasing frequently to the extent of two or three tons. This hardening influence, which imparts increased strength, is a very important point, which must be always taken account of, because it has influential bearings on design and workshop practice. It affords lessons on relative values of high absolute strength, and on moderate strength, combined with high ductility. Thus it is well known that any work done on iron and steel increases its strength and elastic limit; some careful experiments on rolled bars illustrate this well. Bars were rolled in the usual dimensions, from 4 in. down to 1/4 in., from piles of the same original dimensions. A few selected results of the turned bars are as follow:—

TABLE IV.

ILLUSTRATIVE OF THE INCREASE OF STRENGTH DUE TO ROLLING.

Size of bar.	Area of bar in percentage of area of pile.	Tensile strength in tons per sq. in.	Elastic limit in tons per sq. in.
4 in.	15.7	20.6	10.45
3 in.	8.8	21.3	11.8
2 in.	4.4	21.6	14.2
1 in.	3.1	22.8	17.2
0 1/2 in.	2.2	23.5	17.4
0 1/4 in.	1.6	26.6	17.9

Again, Professor Unwin found that steel rails 150 ft. long showed different degrees of strength and ductility in the hotter end which passes through the rolls first, and the colder end which follows last; thus a hot end gave 46 tons tenacity, 22 per cent. extension in 2 1/2 in., while the cold end gave 40.84 tons tenacity and 17.6 per cent. extension. Similar results have been obtained by experimentalists on bars and plates, an amount of rolling only sufficient to effect a comparatively slight reduction in diameter or thickness sufficing to increase the tensile strength by two or three tons, and reduce the elongation by one-third or one-half; the changes thus effected are, however, entirely removed by annealing. And it is essential to adopt this practice in any case, in which a good deal of work of any kind has been done upon a plate or bar in the course of its manipulation.

FIG. 24.

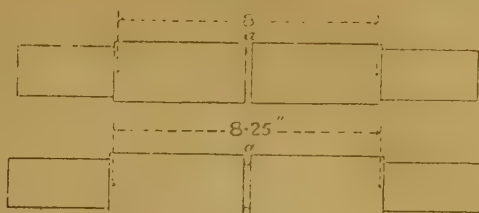


FIG. 25.

than when it is of uniform, or nearly uniform, sections. A nick, of course, is utterly fatal to extension before fracture; but, even without a nick, the mere difference of dimensions, even though a radius is present, weakens the ductility of a specimen. The reason, doubtless, lies in the coercion which the larger, and therefore more unyielding, mass exercises upon the plan of the fibres in the smaller mass adjacent. When a specimen begins to elongate or draw out locally, the general elongation ceases; neither, at any time, is there any sensible elongation in the immediate vicinity of a deep shoulder, though the absolute strength is increased. A nick, or groove, or hole, or abrupt change in dimensions produces the same effect as the shortening of a specimen prevents much general elongation; hence, the shortest pieces are strongest, but they elongate least. In order that considerable elongation shall take place it is necessary that there be a considerable length of uniform section to elongate. To obtain the highest degree of absolute strength with a test-piece the length of uniform section should be almost nil. Thus Figs. 15-17 show test-pieces used in some experiments of Mr. Strohmeyer, each of the same net breadth; b, Figs. 16 and 17, are practically very short test-bars, that is, there is no sensible length of uniform section; Fig. 15 was of the ordinary length, a. The result was that Fig. 16 was stronger to resist fracture by 9 per cent. than Fig. 15, and Fig. 17 was 4 per cent. stronger. A series of experiments, conducted by Mr. Windsor Richards, on pieces like Figs. 15 and 16 gave very similar results, Fig. 16 showing on the average 12.6 per cent. of strength over Fig. 15. Again, taking circular pieces, Fig. 18 shows a nicked specimen, equivalent to a bar having no length, and Fig. 19 one having about 1 1/2 in. of uniform length; Fig. 18 broke at a stress corresponding with 55.25 tons per square inch of section, and Fig. 19 at one of 35.87 tons only. Tests, made by Sir Benjamin Baker, on specimens very similar to Figs. 15 and 16, gave differences of 12 per cent. Evidently the shortening of a test-bar, by diminishing or altogether preventing drawing out, leaves the full, instead of a reduced, area to resist the ultimate tensile stress.

Further, Mr. E. Richards proved that the effect of recessing or grooving is confined absolutely to the locality of the groove; that is, in a specimen like Fig. 20, the reduction of area will be nearly regular on the edges and faces; but in a specimen like Fig. 21 it will be normal in the thickness a, but less than about one-half the normal amount in the narrowed width, b.

The effect of shortening a test specimen is also seen in a comparison of Figs. 22-25. Fig. 22

FIG. 28.

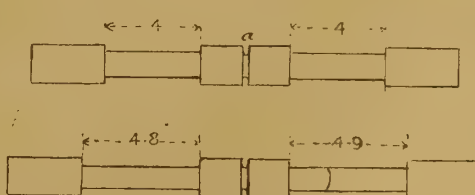


FIG. 29.

Other lessons are learned incidentally by means of test-pieces which would hardly be learned otherwise: it is well-known that fracture is more likely to occur in cast crystalline metals when there are abrupt and considerable differences in the mass of adjacent parts than when they are tolerably uniform in section; the same is true, though in a lesser degree, in fibrous materials. A test-piece will stand less elastic strain when there is a considerable difference in adjacent dimensions

was a test-bar of Mr. E. Richards, of Siemens-Martin steel, which bore the appearance of Fig. 23 after fracture. Fig. 24 was a test-bar of the same steel nicked, to give the same sectional area—one square inch at a, as in the case of Fig. 22. Fig. 23 fractured at 28.35 tons per square inch, Fig. 25 at 40.8 tons, Fig. 23 elongated to 2.20 in. before fracture, Fig. 25 .09 in. only on the actual width, a. The reduction of area in Fig. 23 was 44.5 per cent., that in





DETAIL OF PANELS OF STAIRCASE BALUSTRADE.

Fig. 25 13.45 per cent. only. The general stretching was slight, causing a small contraction of 2.82 per cent. of the sectional area of the large portion.

Yet another experiment was tried with a specimen in which, instead of the very short and abrupt groove, a series of grooves, Fig. 26, was turned along an 8 in. length of bar; the widths of the grooves were  $\frac{1}{2}$  in., and the intervening collars  $\frac{1}{2}$  in., and the angles were left square. The diameter at the bottom of the grooves was the same as before. The result lay between that of the plain standard bar, Fig. 22, and the nicked bar, Fig. 24. A stress of 34 tons fractured the bar across at a groove, being 20 per cent. more than that which fractured the plain bar. The bar extended from 8 in. to 9.150 in., Fig. 27, being about one-half the extension in the plain bar.

A striking confirmation of the difference between mere tensile strength and useful strength, meaning by that, strength combined with ductility, is afforded by another experiment, in which the two kinds of stress and strength—that due to nicking, and that due to a plain specimen—were associated in the same bar. Fig. 28

Mr. Adams's experiments proved that the sectional form of a bar, that is, of a bar of uniform section lengthwise, does not influence the strength. Thus bars, channelled like Fig. 30, carried the same loads as bars of plain, rectangular cross-section of the same area.

The foregoing facts have their application in questions involving relative dimensions of adjacent parts, in punching, drilling, perforating, &c., of work done upon material, the hardening effects of which must be removed by annealing, and in many other ways, the reasons for which would not be clear without a knowledge of these facts.

J. H.

#### THE MONIER SYSTEM.

At a students' meeting of the Institution of Civil Engineers on the 15th of January a paper on "The Monier System of Construction" was read by Mr. Walter Beer, Stud. Inst. C.E., Mr. Ewing Matheson, M. Inst. C.E., occupying the chair. In the brief historical account of the Monier system, with which the paper opened, the author showed how it originated in the attempts

pansion of the two constituents were for all practical purposes identical. The economy of the system in the construction of girders and arches was considerable, owing to its great strength and compactness, and further, it was absolutely fire-proof. Large spans might be used for floors, and the small amount of head-room required was a factor often of great value. Arches of 150 ft. or even greater span might be constructed, and the rise need not exceed one-tenth of the span, so that the system could be used in situations where brick and stone would be impossible. The author dealt with the practical details and cost of the method, stating the particular qualities of materials most advantageously used, and he also entered into a mathematical consideration of the relations existing between the dimensions and quality of the different portions of the structures and the stresses in them under known loads. The paper concluded with an account of tests to destruction of three Monier arches with a span of 12 ft. and a width of 4 ft. They were composed of three to one concrete, for which crushed granite, coke breeze, and crushed brick were respectively used, with a simple netting of 4 in. mesh, formed of  $\frac{3}{8}$  in. longitudinal rods and  $\frac{1}{2}$  in. transverse rods, imbedded 1 in. above the undersides of the arches. The first arch was loaded uniformly, and after a central deflection of 2 in. failed when the load reached 11.7 cwt. per square foot. The second was loaded at one side of the centre only, and failed under a load of 4.8 cwt. per square foot, when the deflections at the unloaded and loaded sides and centre were respectively  $\frac{3}{8}$  in.,  $\frac{1}{2}$  in., and  $\frac{3}{8}$  in. The third arch was also broken by a load on one side only, but withstood a pressure of 7.0 cwt. per square foot. The paper was accompanied by drawings illustrating several examples of the system, including the arches upon which the author's tests were performed.

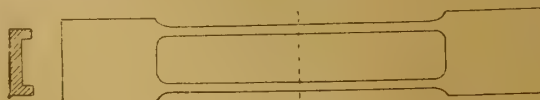


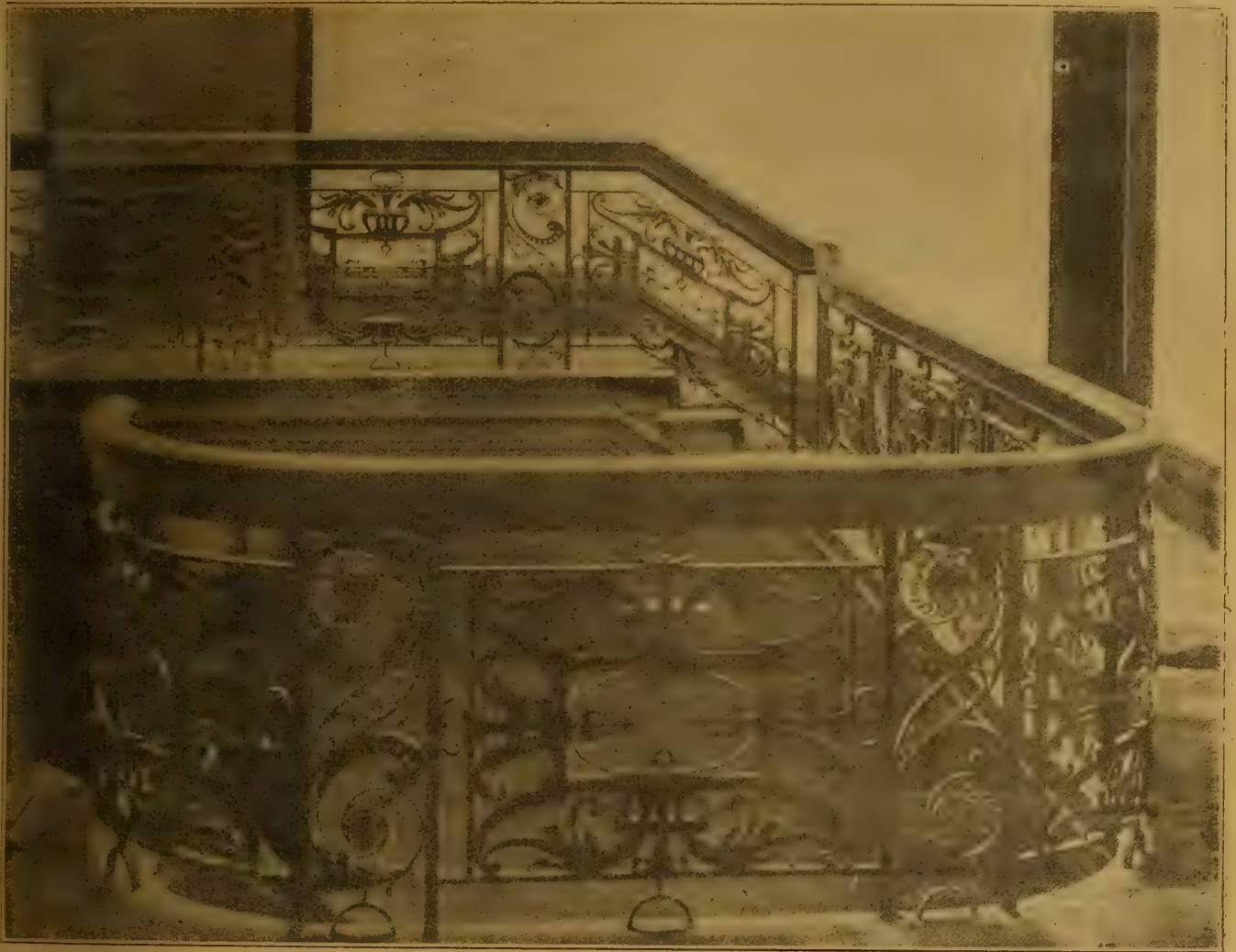
FIG. 30.

represents a specimen in which two portions 4 in. long are plain, of  $\frac{1}{2}$  in. diameter, or area equal to one square inch, and a centre groove  $\frac{1}{2}$  in. wide, is turned down to 1 in. diameter, or about 20 per cent. less in area than the plain portions. One would naturally expect the narrower section would have broken across first, apart from knowledge previously gained respecting the rigidity afforded by adjacent larger portions, and so the specimen did not break at the centre, but at one end, as in Fig. 29. The plain portions extended, and their area was reduced 16.3 per cent., while the area of the grooved portion was only reduced 2.5 per cent.

of a Parisian florist of that name to obtain large vessels of a material more durable than wood and lighter than concrete. The principle of the system was stated to be the combination of Portland-cement concrete with iron or steel in such a manner as to develop in the same material the high resistance to compression and binding of the former, and the great tensile strength of the latter. It had been found that in such a combination the good qualities of both materials were retained, and no chemical action was found to occur between the iron and the moisture in the concrete. The latter adhered firmly to the smooth surface of the metal, and the co-efficients of ex-

The third meeting of the Auctioneers' Institute this session will be held in the lecture-hall of the institute, 57 and 58, Chancery-lane, on Tuesday next, the 26th inst., at 8 p.m., when a paper will be read by Professor Banister Fletcher upon "The Practice of Compensations."





HAMMERED IRON STAIRCASE BALUSTRADE.

## HAMMERED IRON BY MESSRS. JONES AND WILLIS.

THE example of hammered ironwork here illustrated has been made and fixed by Messrs. Jones and Willis, of Birmingham, London, and Eagle Works, Hornsey, to the designs and under the superintendence of Mr. Theophilus Allen, architect, at 184, Queen's-gate, W. The illustration above shows the balustrade in position, and that on the opposite page a detail of one of the panels. It is a very fine piece of hammered work.

## ADAPTABLE SPECIFICATIONS.—XXVII.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued).

**DRAINAGE.**—Though drainage, in a specification, is frequently placed along with excavating and brickwork, it is better, when there are no urgent reasons for haste, not to set about it till the external scaffolding is taken down. Where the drains, too, or part of them, have to be laid on newly-made ground, the longer this ground can previously be left to settle the better. With the view of keeping on the safe side, it is the custom now, with writers on this subject, to state that all foul drains should be laid on concrete. Where the shallower parts of them run near the surface this is desirable, for the surface soil around a house is generally of garden-mould, or something similar. Near London, again, even the deeper portions of a drain are, oftener than not, in clay; and in other places, as, for instance, at Bournemouth, the pipes have to be laid in soft, peaty sand. In all these and similar cases concrete is essential if the drains are not, sooner or later, to settle irregularly. But there is no need for it in solid, compact gravel, in chalk, and in firm and very

stony soils. Here the great point is not to dig the trenches deeper than they are required for the drains. In other words, the pipes should rest on the natural soil, and not on material which has been filled in to reduce an excess of depth in the trenches. The pipes should rest on the ground throughout their whole length, which implies that shaft sinkings must be made in it to take the projecting socket.

To keep the fall of each drain true and uniform, "sight-rails" will have to be set up by the contractor, except in the case of being short branches. A "sight-rail" is a horizontal strip of wood, placed right across the intended line of the drain, and carried by two strong uprights, one on each side of the trench, fixed firmly in the ground. The sight-rails may be fixed one above the upper and the other above the lower end of the straight length of drain, in the laying of which they are to be used, and the essential point about them is that they must both be exactly at the same distance above the slope or gradient which has been decided on. Thus, if the straight piece of drain for which they are provided is to be 60ft. long, and if it is to fall 1in. in 5ft., the lower sight-rail will be exactly a foot lower down than the upper one. If the upper one is, say, 8ft. above the invert of the drain immediately below it, the drain must be so laid that its invert will also be 8ft. immediately below the lower one. But this is not enough. The pipes might be correctly laid at both these points, and yet be full of all sorts of up-and-down undulations in the space between. To prevent this, a "boning-staff" is used, and if this in the supposed case is also 8ft. long, it needs only to be held upright at any intermediate point in the trench, with its top just touching the "bone line" between the two sight-rails, and its lower end will give the proper depth for the invert at that point.

Where the drains are to be laid in concrete the bottom of the trenches should first be well rammed.

It is usual to make the concrete from 4in. to 6in. thick under the middle of the pipe, to let it project 5in. or 6in. on each side beyond the outside diameter of the pipe, and from thence to weather it up on each side so that it forms a channel, inclosing and supporting the lower half of the drain. The flat part of the concrete should first be laid, following accurately the gradient intended for the drain. It is a good plan to form grooves across it about 5in. wide by 2in. deep by inserting pieces of wood of that scantling, and as long as the width of the concrete, at the point where every socket will occur. With ordinary pipes this will be every 2ft., but pipes in 3ft. lengths can now be obtained, which save a proportionate amount of labour in jointing. The "flaunting up" in concrete to support the sides of the pipes should be done after all had been laid and tested.

The socket of each pipe should, of course be laid next the higher end of the drain. In long drains workmen will sometimes adopt the bad plan of beginning to lay the pipes from each end at once, so that they meet in the middle. This meeting is seldom quite accurate; either there turns out to be too great a space between the pipes there, or not quite enough, and in either case defective work results. The jointing of the pipes is often done with extreme carelessness. Sometimes spaces are left through which sewer-gas can escape. Sometimes the lower part of the joint is anything but water-tight, and then the sewage soaks into the ground and softens it, so that the drain-pipes sink irregularly. At other times the cement used for jointing runs into the interior of the pipes, forming hard lumps there which cause stoppages. Again, where neat cement is specified, cement mixed with a large proportion of sand may be actually used, and even the sand may be contaminated with loam or clay. Clay by itself was once much used for jointing, and it has some advocates still. They say that it adapts itself to accidental settlements better than cement does.

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But it is liable in time to be quite washed out of the joints, while roots easily penetrate it, and in time may fill up the whole interior of a pipe.

Various forms of joint are manufactured to avoid these evils. In some of them there is a ring of some bituminous substance, such as a mixture of tar and sulphur and ground pipes round the lower part of the spigot and socket. When the two are pressed together the bituminous substances adhere and form a tolerably close joint. A space is still left between the upper part of the spigot and the socket, and this space is then filled with neat Portland cement in the usual way. There is thus a double joint, and the bituminous part of it keeps the cement from running through and forming obstructions in the pipe. The plain cement joint, however, by itself, may with care be made better than it usually is, and obstructions in the pipes, caused by the cement, can easily be prevented. One way of preventing them is to make up a bundle of hay, fitting the bore tightly, and to draw it, by a cord, through every pipe just after the joint has set, but before the cement has hardened. If properly done this wipes the inside of the bore clean.

Gullies and traps should be set level, and in concrete. Being often near the surface of the ground, they may probably be in more treacherous soil than the general line of drain, and are hence even more liable to sink and to allow their joints to open. They are also more exposed to injury from blows and heavy weights. Junctions are often very carelessly made, even by men who know better. To save the trouble of ordering them, they will knock a hole in the side of a pipe, and turn another into it, patching it up, very roughly and imperfectly, with cement, and throwing a spadeful of earth over the place to conceal it from the architect until the work is filled in. Bends are sometimes constructed by the ingenious bricklayer on the same principle. Fragments of pipe, even brickbats, are cemented together into an approximation to the desired shape. Of course the interior is full of angles and projections, and there is very soon a "stoppage of the drain." The dexterous mechanic who provides this sort of substitute for a proper curved pipe, seldom puts his name on his workmanship. He modestly keeps his own share in the matter out of sight, and when, after his departure, it is discovered, the blame for permitting it naturally attaches to the architect. Where the drains are laid on concrete, tricks like these are not so easily concealed; but in other cases, and especially if the builder is allowed to fill in a few yards of the drain at a time, as they are completed, there is no knowing what abominations this filling-in may conceal.

The drains should not be covered in till they have been tested, and before they can be tested, the cement must have time to set. Stoneware drains should be able to bear, without leaking, a head of 8 ft. or 10 ft. of water. To test them, the lower end of the drain should be stopped with a drain-plug. A vertical length or two of drain-pipe may be temporarily fixed to the upper end of the drain by well-tempered clay, so as to give the necessary height, measuring from the bottom of the drain close to the plug. Then the drain and the upright addition must be filled with water up to the point decided on, and the level of the water here must be carefully marked. If it falls perceptibly in the course of an hour or two, a search must be made for the point or points at which it leaks away, and when these have been made good and time has been allowed for the cement to set, the drain must be tested and re-tested till it is proved to be sound. At best, however, stoneware pipes are not absolutely impervious, and with a great pressure of water there will be a considerable leakage, even when the joints are sound.

An important point is the filling-in of the drain trenches. This is often done too soon—a thing which can hardly happen if time is given to allow the joints to set and then to test them. Where earth and stones are filled in while the cement is soft, and when they are then heavily rammed down, leakages are sure to be produced, even if they did not exist before. No ramming should be in any case allowed until at least 2 ft. of soil has been carefully put in and pressed down over the pipes; but this needs to be done solidly, or the filling-in will settle considerably, and this will cause objectionable holes in the garden, the paths, or the pavements. Drains should not come too near the surface of the ground, or they are liable to injury from gardening operations, from the use of ladders, and from many other causes.

Gullies should have a deep water seal, to prevent their drying and allowing bad smells to issue from them. It is no unheard-of thing for the occupier of a house to suppose—and to assure his friends—that the whole system of drainage on his premises is faulty, when nothing is needed except the occasional filling of a trap by means of a pail of water. If gullies are not fixed level, or if they afterwards get out of level by a sinking of the ground, the depth of the water seal is probably lessened, if not absolutely reduced to nothing.

#### CEMENT TESTING AT PHILADELPHIA.

THIS number of the *Proceedings of the Engineers' Club of Philadelphia* (August to November, 1896) contains an account of "The Cement Laboratory of the City of Philadelphia," by Richard L. Humphrey. The author describes the testing laboratory of the Department of Public Works, where all the cement used in municipal work is examined, and the apparatus employed for the purpose. A set of specifications is adopted as the city standard, and forms a basis for the acceptance or rejection of cement. The author describes the system used by which the cement is inspected and tested. The tests are made from samples from actual shipments on the work. These are notified by inspectors. The brand and number of bags or barrels, time and place of delivery, and the purpose, are set forth on cards. The sampling is done to prevent any unfair advantage being gained, a small quantity being taken from one barrel in every five or ten, and the cement is obtained from the heart of the barrel to secure a fair sample. Special collection cans are used to bring the sample to the laboratory, one holding two and the other four samples. The recording is then done, taken from the notification card, which gives all the data relating to the cement. The author describes the method of making briquettes, the weighing the material being done by a pair of scales sensitive to  $\frac{1}{2}$  gramme under a load of two kilogrammes in each pair. The mixing and moulding is done on a special table in two parts, each having a plate-glass top. The method of moulding is with brass moulds, the "three-gang" mould being generally used. Details are given of the mode the sand is incorporated with the cement, and it is stated that mixing and moulding by hand has been found to give more uniform results than can be obtained with any of the machines in use. Other processes are described—the time of setting determined with a Vicat needle; the mode of determining fineness, tensile strength, &c., are each treated, and the paper is illustrated. We should like to see our leading municipal authorities taking the subject of cement-testing up, as is done in Philadelphia, Paris, and other places. The Zurich laboratory is the most complete of any. It occupies a large building where every sort of building material is tested before it is employed in large structures.

#### STABLE CONSTRUCTION AND SANITATION.—I.\*

##### INTRODUCTION.

DOMESTICATED animals, such as horses, cattle, &c., cannot be maintained in a thoroughly robust state of health unless the buildings in which they are housed are designed and constructed with due regard to sanitary efficiency. Of late years great improvements have been made respecting the general details of construction, and for stables, cowhouses, &c., of the best class, the arrangements are now practically all that can be desired.

At one time—to judge from the stable buildings that were commonly met with in all parts of the country—it was apparently considered that any sort of insanitary and dilapidated shed might be permanently utilised for this purpose. Such erections were frequently damp and dark, having also a close, evil-smelling atmosphere, so that the conditions of animal life amidst such unwholesome surroundings were the most unfavourable that could well be conceived. It is, therefore, scarcely to be wondered at that places of this description in time became breeding grounds for various diseases, which, in many instances, were capable of being communicated to man, either directly or indirectly.

The sanitary condition of cowhouses especially

exerts a most important and direct influence upon the health of the community at large, for certain diseases which are liable to be contracted by cows as a consequence of their confinement within dirty, badly-drained, and ill-ventilated buildings may be directly transmitted, through the medium of their milk, to persons using the same as an article of diet. As an instance of the serious attention which should be given to this view of the matter, it may be mentioned that some of the most virulent epidemics of typhoid or enteric fever which have occurred in this country within recent years are directly traceable to the use of milk which has previously become infected. This has been demonstrated by the fact that the disease has in many instances been confined within the limits of certain families receiving their milk supplies from the same source.

From time to time much has been done towards the compulsory improvement of the hygienic condition of this class of building by means of judicious legislation, so that local and other authorities are now in a position to enforce some degree of sanitation—at least, as regards the lighting, ventilation, cleansing, drainage, and water supply of cowhouses in the occupation of all following the calling of a cowkeeper or dairyman. Under the Dairies, Cowsheds, and Milkshops Order of 1885, and the Contagious Diseases (Animals) Act of 1886, the local authorities may insist on the provision of adequate sanitary arrangements in cowhouses for the prevention of disease amongst animals, and for properly safeguarding the public health.

In addition to the provision of stables which are properly drained, ventilated, and lighted, it is necessary that they should be frequently and systematically cleansed, or the advantages to be gained from well-designed and constructed buildings may be rendered in a great degree inoperative. Considering that a large amount of solid excrement is deposited within the building where the animals are sheltered—the emanations from which are deleterious to health—it is important that such effete organic matters should be removed as soon as possible.

The word "stable," when used in its broadest and most extended significance, includes all buildings designed for the lodgment of animals in a state of domesticity; but as generally understood, the term more particularly refers to a building used for the accommodation of horses only. Whilst, therefore, using the word stable in its restricted and commonly accepted sense of referring to any erection exclusively intended for the reception of horses, yet at the same time it is proposed to consider in the following articles any special requirements which are necessary to the proper construction of buildings for effectively housing various other kinds of domesticated animals. When buildings of this description are under consideration they will be specifically referred to as cow-houses, &c., as the case may be.

Stables vary considerably in details of construction and arrangement according to the class of horses they are designed to accommodate; but whatever the differences which are thus necessitated, it is essential that they should one and all comply with certain sanitary requirements if they are intended to exercise no injurious effects upon the health of the animals confined therein. For general purposes, stables may be divided into five classes—viz.:—

1. Stables for racing and hunting establishments; also those intended for carriage and saddle horses of the wealthy, such as are attached to country and town mansions. These stables are frequently designed and fitted up regardless of expense, providing at once the most convenient and luxurious description of stables that can be erected; but they cannot in all cases be considered the most healthy, as they are sometimes deficient in adequate means of ventilation.

2. Stables attached to the town and country residences of gentlemen of moderate fortune. Whilst every attention is usually given so as to secure the health and comfort of the horses, they differ from the previous class, inasmuch that the fittings and furnishings generally are of a simpler and less expensive character, but at the same time thoroughly good and serviceable.

3. Stables for the accommodation of large numbers of horses, as required for army purposes, omnibuses and tramway companies, and for large business firms and general carriers. In stables of this type, the question of first cost of construction and the amount of annual maintenance involved becomes an important matter, so that it is necessary that everything connected therewith shall be



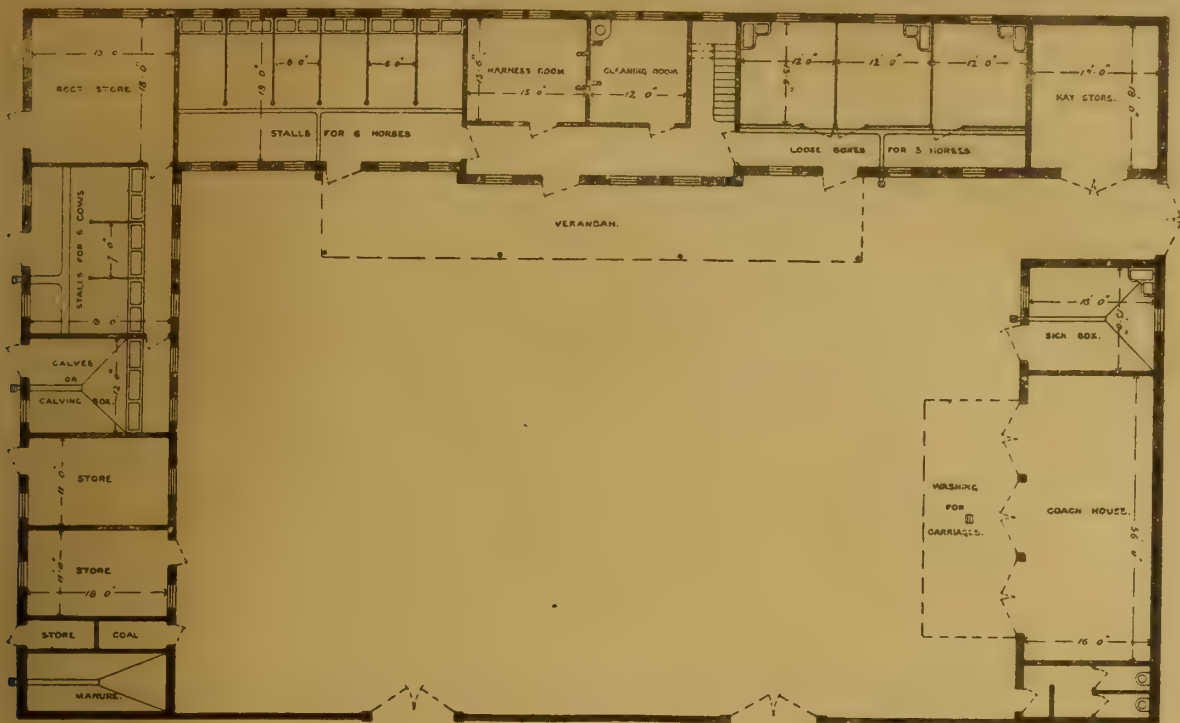


FIG. 1.

of the utmost simplicity of construction consistent with the health and comfort of the horses. The horses themselves are generally of a hardier and more robust nature than those for which the preceding descriptions of stabling are intended, so that the ventilating and other arrangements may be greatly simplified. As horses of this class do not usually pass so much time within the stable as those previously mentioned, the amount of space provided per head is frequently reduced on economic grounds so far as this is compatible with sanitary efficiency.

4. Livery and Hackney Stables. Cheapness of construction is usually the first consideration in stables of this class, adequate provision for the maintenance of the health of the horse being frequently a minor matter. The fittings are of a simple and inexpensive description.

5. Farm Stables. As a rule, these are the cheapest class of stable buildings erected. The fittings are generally of a primitive character, being largely constructed of wood. Such fittings, although they cannot be considered as complying with modern sanitary requirements, have the advantage that they can be easily repaired by any handy man, which is a great consideration in country districts. The drainage arrangements are frequently inadequate; whilst the ventilation consists in most cases of a few hit-and-miss ventilating windows arranged in a haphazard fashion.

Cow-houses, as a whole, are more uniform in general design, the chief differences being in the character of the fittings and ventilating appliances. In cow-houses of the best and most modern construction the fittings are of iron, whilst an ample supply of light and air is provided; but for ordinary dairies and farm buildings the fittings are still in a great measure made of wood, the drainage and ventilation of the building being effected in the simplest and cheapest manner.

To secure the highest degree of sanitary efficiency in the construction of stables and cow-houses, the chief objects to be attained may be summarised as follows, viz. :—

1. A well-drained site, sheltered from cold winds, together with abundance of light and pure air.
2. The buildings to be quite dry, and free from damp.
3. Adequate drainage arrangements.
4. Thorough ventilation.

The importance of supplying an abundance of fresh air for breathing purposes cannot be over-estimated, for it is found that consumption and other lung diseases are directly attributable to defective and insufficient ventilation, whilst a general loss of vitality and power of resisting various diseases common to horses and cattle are traceable to the same cause.

Even from a business point of view it is desirable that stables, cow-houses, &c., shall be so designed as to be perfectly healthy and comfortable. Where horses and cattle are confined for any length of time in a badly-lighted, ill-ventilated, and defectively-drained building, their general health must of necessity suffer, and their market value be proportionately reduced. Indirectly, another pecuniary advantage is obtained, inasmuch that the animals derive more benefit from their food when confined and fed in a warm, well-ventilated building. Accordingly, the provision of thoroughly sanitary buildings becomes a matter of the utmost consequence, and it is now proposed to consider in detail the best practical means of effecting this desideratum.

#### THE SITE.

The choice of a site for stables is usually limited by the local circumstances governing each specific case, so that it may be necessary to erect the buildings on a particular plot of land irrespective of its suitability for the purpose. In places where the free selection of a suitable site can be made, it is important to consider the situation and nature of the ground, and the position of the buildings in relation to aspect, wind, air, and light.

The best situation for stables is on high, dry land, having such a physical conformation that the whole of the surrounding area is naturally drained so far as the surface-water is concerned. Marshy, low-lying ground should be avoided where possible. With regard to the nature of the ground itself on which to erect buildings of this description, nothing can be better than a thick bed of gravel or sand, so that any surface-water is quickly carried away, leaving the upper part of the ground dry. Next to porous self-draining soils of this class may be placed a rocky formation, such as limestone, sandstone, chalk, or granite. Land of a stiff, impervious nature—such as heavy clays, &c.—are objectionable, whilst alluvial soils and made ground should, as a general rule, be regarded with suspicion, and, in any case, should be carefully examined before building thereon.

The site having been duly selected, it becomes necessary to ascertain what is required in the way of subsoil drainage. It is desirable that provision should be made for the whole of the surrounding area being thoroughly drained to a depth of about 5ft. from the surface, in order that the normal level of the ground-water or land soakage may be kept well below the surface of the ground.

If practicable, the stables should be so arranged that they are protected in some measure from excessive and cold winds; but the air should be free to circulate on all sides of the building. Provided they are sheltered in this manner, the

actual aspect obtainable does not become a matter of very great moment; but in places where a choice is given, a south or west aspect is to be preferred where possible. Similar considerations to those mentioned for stables should also govern the selection of a site for cow-houses and other buildings of a similar character.

#### GENERAL ARRANGEMENT AND CONSTRUCTION.

The disposition of the various buildings required for stable purposes will differ in almost every instance, according to the site available and the amount of accommodation desired. Fig. 1 is a typical arrangement of the principal stable buildings and accessories required in connection with a gentleman's country residence. Accommodation is provided for nine horses, together with a sick-box, coach-house, harness-room, hay and straw store, manure-pit, &c.; stalls for six cows, a loose-box for calves, root and other stores are also provided. The entrances to the latter group of buildings are quite distinct from the stable-yard proper, so as to avoid any subsequent confusion in the management of horses and cattle.

(To be continued.)

#### CHIPS.

On the 30th inst. the Mayor of Gateshead will formally open the branch bank which the trustees of the Newcastle Savings Bank have erected in the sister borough, from the plans and designs of Mr. Stephen Piper, M.S.A., of Newcastle.

The Master of the Rolls and Lords Justices Lopes and Chitty have dismissed the appeal of Messrs. Lee, Scott, and Gibbons, solicitors, of Manchester, from the verdict and judgment of Mr. Justice Cave and a special jury at Manchester December Assizes, holding them liable as mortgagees in possession for goods supplied in completing some new houses erected by one Golding, a speculative builder, in Clare-road, in that city.

The new board schools at Stroud Green, built for the Hornsey School Board and opened last week, were designed by Messrs. Mitchell and Butler, whose plan was selected in competition. The schools house 1,351 children, and the contract was taken by Messrs. Kirk and Randall, of Woolwich, at £24,218.

The case in which a coroner's jury empanelled by Dr. E. M. Grace had found a verdict of manslaughter against the chairman of a district council and an inspector of nuisances, on the ground that they had neglected to fence a quarry, came before Justices Wright and Bruce on Tuesday. It was mentioned that the facts had been laid before the Public Prosecutor, who stated that the whole proceedings were bad on the face of them. Counsel also mentioned that the quarry had been fenced by the local authority, but that on the day of the accident a man was charged with stealing some of the fencing. The court quashed the inquisition.



## OBITUARY.

COLONEL P. K. SEDDON, chairman of the directors of Price, Walker, and Co., Limited, timber importers, Gloucester, died on Sunday. Deceased, who unsuccessfully contested Grimsby in the Conservative interest in 1877, was sixty-five years of age, and had been connected with the above firm at Grimsby and Gloucester for 45 years, with a short interval spent in Canada and Chicago; at the latter place he was British Consul.

## CHIPS.

Electric power for drawbridges is to be adopted for all the bridges over the Chicago River, at Chicago, Ill., replacing the steam plant now required for each bridge.

The building of a new Roman Catholic church at Eccles will be begun in the spring. The new church, which will be in the Early English style, will cost £6,000, exclusive of the tower, and will seat about 650 persons. The church and presbytery will adjoin the present mission schools in Liverpool-road.

Some extraordinary proceedings took place on Sunday at Farnham, on the Moor Park estate, owned by Sir William Rose. His solicitors had notified to the Farnham Urban Council that the gates leading to the footpaths through the estate would be closed on that day, Sunday being "the day on which the public mostly trespass." A special meeting of that council and of the rural district council had on the previous day instructed their surveyors to attend at the gates on the Sunday morning and demand admission. They found the gates locked. They asked to be allowed to pass through the park, but were refused. The chains of the gates were then broken, and a large crowd rushed through, but there was no serious disturbance.

A new branch dispensary is being erected in Malaga-road, Bedminster, Bristol, from plans by Mr. W. V. Gough, of the latter city. The building is of red brick with freestone dressings, and is three stories in height. The contractor is Mr. George Humphreys, also of Bristol.

The carpenters and joiners of Peterborough are uniting in asking their employers for 3d. per hour increase.

The Sheffield City Council discussed at great length at their last meeting the proposals for the rearrangement of the water office. The proposal of the water committee that, having regard to the altered position of the management of the water department, and to the increased responsibilities and duties which will devolve upon Mr. Terrey, that he be appointed general manager of the undertaking, and that his salary be £800 per annum, an increase of £200 per year, was adopted; but a further recommendation that Mr. Leonard S. Marsh be appointed engineer, at a salary of £600, an increase of £150, was rejected, and by 29 to 21 votes it was decided to increase Mr. Marsh's salary to £500 only.

At Truro, on Thursday in last week, the Cornwall County Technical Education Committee deputation attended from the Central Technical School Committee to make an application for a grant in aid of the proposed Technical Institute. General approval was given to the scheme, and a special committee was appointed to confer with Mr. Silvanus Trevel, F.R.I.B.A., the architect, and to go confidentially into the question of finance with a view to reporting further to the general County Technical Committee in respect to the application.

At a special meeting of Smethwick District Council, Mr. Charles J. Allen has been appointed surveyor to the council, in the place of Mr. J. C. Stuart, resigned.

At the offices of the Wolverhampton Brick, Tile, and Pipe Company, a meeting of brick manufacturers was held on Friday to consider the advisability of forming an association of members of the trade, and to discuss the price of bricks. Mr. D. Jones presided, and there were also present Messrs. W. Shepherd, M. Johnson, G. Holt, T. Jones, jun., I. Onions, F. W. Dugmore, A. Gregory, and M. Davis. On the motion of Mr. W. Shepherd, it was resolved that those present form an association to be called "The Wolverhampton Brickmakers' Association." Mr. D. Jones was appointed president, and Mr. Holt, New-road, Willenhall, the secretary. It was afterwards resolved to notify the public that after Feb. 1 the price of bricks would be advanced 1s. per thousand.

The ratepayers of Islington have rejected Mr. Passmore Edwards' offer of £10,000 towards the cost of erecting three public libraries in the parish. The result of the poll, taken under the Free Library Acts, was declared on Tuesday night as follows:—For the adoption of the Acts, 11,341; against, 14,416—majority against, 3,075. 36,286 voting papers were sent out. A very large number were spoiled or not returned.

## Building Intelligence.

DEVONPORT.—The Conservative party at Devonport will in a few weeks be in possession of a centrally-situated and commodious club at 7, Fore-street. Since the premises were acquired they have undergone the necessary alterations according to the drawings, and under the superintendence of Mr. Henry George Luff, A.R.I.B.A., and in the course of the next fortnight will be furnished with all modern appliances in readiness for the opening early next month. The premises include a large and lofty billiard-room, with pitch-pine open roof, with a lantern-light extending over the two tables. The contractors for the work were Messrs. G. H. Smith and Son, of Devonport.

IRTHINGTON.—The parish church of St. Kentigern was reopened on Thursday in last week after having been restored, from plans by Mr. T. Taylor Scott, F.R.I.B.A., of Carlisle. In the restoration no characteristic of the old Norman work has been interfered with, care having been taken to avoid even cutting the walls for purposes of bond. Where the new vestry walls, for example, abut upon the old chancel, the connection has been made by means of wrought-iron ties. The new vestry is on the south side of the chancel, and incloses a Norman doorway, being designed to harmonise with the adjacent work. A heating chamber is constructed below it, whence the church is heated by the low-pressure hot-water system. The whole of the seating is new and of Dantzic oak, replacing straight-backed seats. A vestibule, constructed of Dantzic oak, has been built at the main entrance. The organ has been renovated by Mr. A. Barton, organist, Silloth. Numerous other works have been carried out. The cost has been about £800. It is hoped that some day the church will possess a tower and a peal of bells. The chief local contracts were in the hands of Mr. R. Mark, Laversdale, builder; Mr. W. Edger, Brampton, joiner; Mr. W. Anderson, Carlisle, plumber; Messrs. Atkinson and Elliott, Brampton, painters; and Mr. John Corbett, Carlisle, heating apparatus. Mr. J. F. H. Harriman, Nottingham, was clerk of works.

WINCHESTER.—The repair and restoration of the great timber roof of the nave of Winchester cathedral is now practically completed by the staff of Mr. John Thompson, of Peterborough, under the direction of Mr. Russell, the foreman, and the groined vaulting will be proceeded with at once, the workmen being busy constructing the tramway on brackets under the vaulting, on which the "hanging" scaffolding and staging will be moved as the work progresses. The seven bays from the tower will be first examined and made tight, and thereafter the remaining bays to the west end, and then the transept roof and lead will engage attention.

WOLVERHAMPTON.—St. George's Church, which has been closed for extensive alterations, will be reopened on Sunday. The structural changes which have taken place comprise the removal of three bays of each of the side galleries, and the whole of the high-backed pews and free benches on the ground floor, together with the upper galleries, which had provided accommodation for about 200 children. The choir has been extended one bay further into the nave, the altar has been elevated so as to render it visible from all parts of the church, and the sanctuary has been enlarged by the addition of a curved step and altar-rail extending into the choir. A vestibule has been formed at the west entrance. The floor has been laid with oak blocks, and oak open seats have been provided. A new oak pulpit on a stone base replaces the former structure. The works are being executed from designs by, and under the supervision of, Mr. Fred. T. Beck, architect, Darlington-street, Wolverhampton.

A receiving order has been granted in the case of Edward Swain Mansergh, late of Hart-street, Bloomsbury, W.C., and now of Herne Hill, S.E., surveyor.

At the present time no fewer than three different sets of building by-laws are in use in Greater Cardiff. There are the old ones of the Canton Local Board, those of the old Roath Local Board, and those now in force of the corporation of Cardiff. A new code of rules has been adopted by the Cardiff Corporation, and is now under consideration by the Local Government Board.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of this body held on Wednesday, at the Royal Institution, Princess-street, Edinburgh, the president, Dr. R. Rowand Anderson in the chair, a paper was read by Mr. Alexander Drew, consulting engineer, on "The Practical Designing of Iron and Steel Roofing," being introductory to a course of six lectures. The author dealt with dead and live loads coming on roofing, and how to allow for these. He demonstrated the practical methods of determining stresses on roof members, graphic method and method of moments being briefly touched on, with hints on their application. Types of roofs, good and bad, were explained, and the lecturer treated upon points to avoid, if possible, when outlining roof framework. The simple members of framework—struts, ties, beams, beam-struts, beam-ties, bolts, and rivets, their strengths and practical values, were described before passing on to consider practical forms of rafters, struts, and ties; also shoes, junction, and connection plates, &c. Finally, Mr. Drew considered corrugated sheets as used for roof covering, and how they are laid and fixed.

THE EDINBURGH ARCHITECTURAL SOCIETY.—The annual smoking concert of the above society was held in the Imperial Hotel on the 6th inst. There was a large company present, and the programme embraced some of the best talent in the city. The opening meeting of the present session was held in the rooms on the 13th inst. There was a good attendance, Mr. J. A. Williamson, A.R.I.B.A., president, in the chair. The hon. president, Mr. R. M. Cameron, delivered an opening address on "The Dean of Guild Court" and "Hints on Valuation." He pointed out the necessity of attending minutely to the requirements of the Court, in the preparation of plans, so as to avoid any unnecessary delay in passing such plans; also indicated the limit of the powers of the Court, besides giving some very interesting instances where the Court had used its utmost powers to the advantage of the amenity of the city. He afterwards gave some very valuable hints on valuation of property, pointing out that valuation may not be learnt from books, but must be gained by study of sales of property, land, &c., combined with forethought and common sense. At the conclusion of his address Mr. Cameron, on the motion of Mr. Cumming, seconded by Mr. A. R. Scott, was accorded a hearty vote of thanks.

YORK ARCHITECTURAL SOCIETY.—Members of this society and invited guests passed a pleasant evening at Mr. Wm. Hornsey's White Swan Hotel, York, on Saturday week. After dinner a brief toast list was gone through, the remainder of the night being devoted to social intercourse and music (vocal and pianoforte). Mr. Henry Perkin, F.R.I.B.A., the president of the society, occupied the chair, and there were present:—Mr. W. Watson, of Wakefield, president of the Leeds Architectural Society; Mr. A. W. Turner, York, one of the vice-presidents; Mr. Wm. Hepper, past president; Mr. Geo. Benson, Mr. J. W. Knowles, Mr. Norman R. Yeomans, hon. treasurer; Mr. A. B. Burleigh, hon. secretary; Mr. E. A. Pollard, hon. assistant secretary; Mr. J. T. Pegge, Mr. Geo. Bell, Mr. Arthur Harris, &c. Mr. A. W. Turner submitted "The Royal Institute of British Architects and Kindred Institutions," to which Mr. W. Watson responded. Mr. J. W. Knowles proposed "Success to the York Architectural Society," which, he said, was progressing, and had been in existence about 15 years. The president made response. He stated that next session Mr. Godfrey Bingley, of Leeds, the Dean, Canon Argles, and Mr. A. J. Penty would read papers. Songs were rendered by Mr. Whitby, Mr. Loftus, Mr. Watson Hirst, Mr. W. Hepper, Mr. N. R. Yeomans, and others. On Thursday evening, the first meeting of the winter session was held in the Church Institute, Mr. H. Perkin in the chair. Mr. Godfrey Bingley gave an address upon "A Study of English Architecture," illustrated with limelight views.

A movement is on foot in Cardiff to form a builders' association for the district, and following a meeting held for the purpose of protesting against the contemplated action of the district council to carry out the private improvements by their own workmen. Other matters affecting their interests will be discussed.



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## ILLUSTRATIONS.

THE INNER DRAWING-ROOM AT GROCERS' HALL.—STAFFORD COUNTY COUNCIL BUILDINGS.—DECORATIONS FOR THE M'EWAN HALL, EDINBURGH UNIVERSITY.—VILLAGE SCHOOLS, STOW-ON-THE-WOLD.—NEW VESTRY, BOURTON-ON-THE-HILL.—HOUSE AT THORPE, NEAR NORWICH.—BURNS MEMORIAL AT MAUCHLINE.—PRIE-DIEU AND CHAIRS.—CROSS-SECTION OF NEW FACTORY ROOF ON THE "NORTHERN LIGHT" PRINCIPLE.

## Our Illustrations.

CITY GUILDS: NO. XXXI.—THE HALL OF THE GROCERS' COMPANY.

We have already given the plan and several illustrations of the sumptuous group of buildings which form the hall of this great City Guild. To-day a double-page plate represents an interior of the second or inner drawing-room, which, like the remainder of the reception-rooms, is replete with every convenience, and rich in elaboration of fitting and furniture. A description of the work has been given in previous numbers of the *BUILDING NEWS*.\* Mr. Henry Cowell Boyes, F.R.I.B.A., was the architect, and our views were specially photographed for us by Mr. J. T. Sandell with his famous plates.

COUNTY COUNCIL BUILDINGS, STAFFORD.

In the *BUILDING NEWS* for Nov. 27th last we gave an interior view of the council chamber and a plan of these buildings, as well as some photographs of the sculptured figures executed by Mr. Schenck for their internal decoration. To-day we publish a general exterior view, together with a detail sketch of the entrance. The original perspectives thus reproduced were in the Royal Academy Exhibition of last summer. We gave a description of the work on the above-mentioned date. Mr. H. T. Hare, A.R.I.B.A., was the architect.

DECORATIVE FIGURES FOR THE M'EWAN HALL, EDINBURGH UNIVERSITY.

The first illustration of this series from the decorative paintings of the M'Ewan Hall appeared in our pages for Dec. 11th last when we printed an account of Mr. W. M. Palin's admirable work. To-day we publish four more of the principal figures, "Jurisprudence," "Fine Arts," "Mathematics," and "Oratory."

STOW-ON-THE-WOLD BOYS' SCHOOL.

This school, now being completed, will accommodate 120 boys, with provision for an additional classroom for 40 more. It is built of local stone, with stone slate roof and bell-turret of oak and copper. The building is heated by means of hot-water radiators and pipes, and especial care has been given to the ventilation. The building was carried out by Mr. Mark Hookham, builder, of Stow-on-the-Wold, Gloucestershire, from designs by Mr. E. Guy Dawber, of London.

NEW VESTRY, BOURTON-ON-THE-HILL CHURCH, GLOUCESTERSHIRE.

It is proposed shortly to add a new vestry to this fine old church, which, during the past few years, has had new chancel stalls and pulpit and new oak sittings throughout. These have been carried out by Mr. Geo. Poole, in the village, from the designs of Mr. E. Guy Dawber, of London.

RESIDENCE AT THORPE.

This house, built for Mr. Stephen Getting, stands on a site formed out of the hillside, and is thickly wooded in the rear towards the north, whilst the ground in front slopes downwards and reaches the river at a half-mile distant. The prospect is very charming from all the windows. The principal rooms are planned in line with each other, to avoid cutting too much into the hill. The materials are red brick, relieved by stone dressings sparingly used, with Broseley tiles for roofs. The builder was Mr. Hurn, of Norwich, and the architects Messrs. George J. and F. W. Skipper, also of Norwich.

ITALIAN "PRIE-DIEU" AND OLD ENGLISH CHAIRS.

THE "Prie-Dieu" on the sheet of accompanying sketches is carved in walnut wood, and stands 2ft. 10½in. high. The width is 2ft., and the total depth from back to front of kneeling platform 2ft. 1½in. The front between the winged terminal figures is occupied by door to cupboard, which latter is about 1ft. deep, fitted up with shelf, the front being slightly on the slope. There is, in addition, a drawer between the masks under top cornice, and a locker under the kneeling platform, with lift-up flap, which goes back the whole depth of the prayer-desk. It is of Italian workmanship, and dates about 1600, and was purchased by the museum authorities at South Kensington for £19 1s. The Chippendale Chair with cabriole legs and claw-and-ball feet and shell ornaments on the knees of the legs, formed part of Sir E. Dean Paul's collection, and is one of a set of six which was sold at Christie's for 50gs. The Chair of Sir Isaac Newton is remarkable for the heavy semicircular rail stuffed and covered with leather, which seems a somewhat strange production for the time in which the philosopher lived. The legs are square in section, and set anglewise. The two heavier struts to arm-piece are of wood, the two forward ones are of brass, and seem a later addition. There is a plate on the back stating that the chair formerly belonged to Sir Isaac, and was bequeathed in 1812 by Richard Saumarez. It is in the possession of the Royal Society. The arm-chair from the India Office is in walnut with stuffed back, seat, and arms, and covered with red morocco, the lion and crown in back being embroidered in silks and silver thread. The cabriole legs in front terminate, after the manner of the middle of the 18th century (to which period the chair belongs), with heads of dolphins.

NEW FACTORY ROOFING ON THE "NORTHERN LIGHT" PRINCIPLE AT ALNWICK.

CONSIDERABLE additions have been recently made to the London and North British Works of the Messrs. Hardy Bros., the well-known fishing-rod and tackle makers, at Alnwick. The extensions have been roofed on the modern principle of northern lighting, and the form generally known as a weaver's roof was adopted. This method gives the advantage of a steady northern light over the whole of the new part of the factory, and does away with the inconveniences arising from the rays and heat of the sun. The drawing we publish is part of the detail prepared by the architect, Mr. M. Temple Wilson, Alnwick, from which the roof was constructed. The trusses, or couples, were placed about 8ft. apart. In one roof the tie-beam was abolished, in order to gain extra height for the purpose of trying new fishing-rods. The iron stanchions are made on the H section, for the convenience of attaching shafting. The whole of the inside walls and roof-timbers are lime-washed. The cost of this roofing thus devised proved to be about half of what it would have been if executed in iron.

Mr. John Cropper, builder and contractor, Brimington, died at the Hollies on Saturday afternoon. Deceased was the eldest son of the late Mr. Thomas Cropper, builder and contractor, of Tinkersick, with whom he was in partnership until the senior died. He was equally well known in cricketing circles, and was one of the first members of the Brimington School Board.

## COMPETITIONS.

NUNEATON.—The urban district council of Nuneaton considered at their last meeting three sets of competitive designs for a proposed public free library sent in by Messrs. Wood and Kendrick, of Birmingham and West Bromwich; T. F. Tickner, of Coventry; and F. J. Yates, of Birmingham. The design by Messrs. Wood and Kendrick was selected but was considered too expensive, and the authors were requested to reduce the cost to the limit of £1,200.

## CHIPS.

At a meeting of the Raydon School Board, held on Tuesday, Mr. Henry Geo. Bishop, M.S.A., architect, Stowmarket, was appointed architect to the board.

The new free library, Harrogate, is being warmed and ventilated by means of Shorland's patent Manchester stoves and patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Darley Abbey Church, near Derby, has just been presented with a handsome brass eagle lectern by a member of the congregation. It was manufactured by Messrs. Jones and Willis, of Birmingham and London.

The Metropolitan Asylums Board, at their meeting on Saturday, approved and adopted, subject to the sanction of the Local Government Board, certain revised plans for the partial reconstruction of the North-Eastern Hospital. The plans provided for a total accommodation of not more than 548 beds, and the architects' estimate of the cost of carrying them out was £107,111. It was announced that there was absolutely no foundation for the statement that the cost of the works of the Brook Hospital had exceeded the estimate by upwards of £100,000.

The Mayor of Brighton proposes that the sum of £600, the balance of the £1,000 presented by him to the corporation, should be expended on the purchase and erection of a statue of the Queen in one of the public pleasure grounds, in commemoration of the 60th year of her Majesty's reign.

Upwards of £2,000 has been promised for a Church Institute, which is to occupy a site contiguous to Portsea parish church, towards the erection of which the late Mr. W. H. Smith contributed sums amounting in all to more than £40,000.

In the Manchester City Art Gallery, on Friday, there was presented to the city of Manchester a life-sized portrait of the Rev. Dr. Maclaren in commemoration of that gentleman's jubilee as a preacher.

A parish hall at Playford, near Ipswich, was opened on Thursday in last week. It is Gothic in style, is built of red brick, and measures 34ft. by 22ft. Mr. W. Sadd, of Playford, was the builder.

Sir John Stirling Maxwell, M.P., performed, on the 14th inst., the ceremony of opening the classrooms which have just been added to the Glasgow Institution for the Deaf and Dumb at Langside, at a cost of about £4,500.

Consequent on the retirement of Mr. George F. Lyster from the post of engineer-in-chief to the Mersey Docks Board on a pension of £2,500, and the appointment of his son, Mr. Anthony G. Lyster, as his successor with a salary of £3,500, the Mersey Docks Board have this week appointed Mr. William H. Le Mesurier, principal assistant to the engineer, as principal assistant engineer, to be located at the Dockyard, Coburg Dock, at a salary of £1,500 a year.

At Tranwell, on the 14th inst., the Mayor of Morpeth performed the ceremony of cutting the first sod of an extension to the waterworks at that place, whence the water supply will be drawn for Morpeth.

The Louvre Collection has acquired by a bequest the late Ford Madox-Brown's "Haidee and Don Juan."

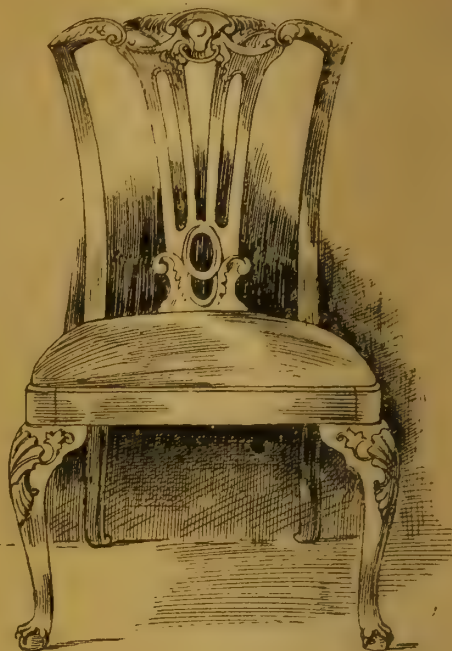
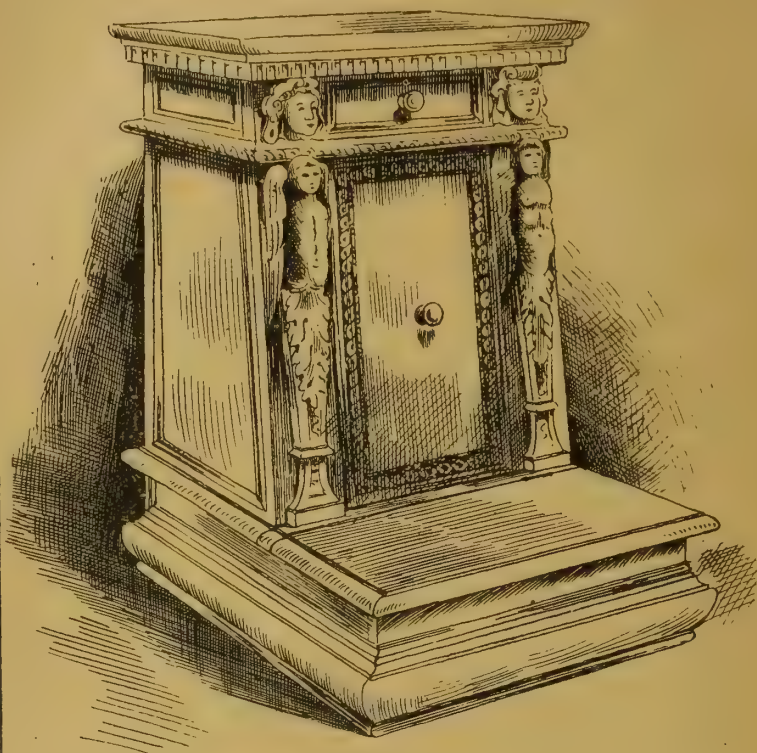
The town council of Glossop have decided to increase the salary of Mr. T. Haynes, the borough surveyor from £180 to £208 a year.

New buildings have been erected on the southern side of Friar-street, Reading, for Messrs. Fidler and Sons, seedsmen. The shops are used for wholesale and retail business, and at the rear is a suite of offices and clerks' rooms. Behind are four stories of stores approached from a covered yard, and beyond are the stables, stores, &c. The lower part of the façade towards Friar-street is built in polished granite, the upper stories being in local red brick with Bath stone dressings. The buildings, which are warmed throughout with hot water and lighted by electricity, are from the design of Messrs. Charles Smith and Son, of 164, Friar-street, in the same town.

\* See *BUILDING NEWS*, Jan. 25, March 22, and August 2, 1895; April 17 and Oct. 9, 1896.

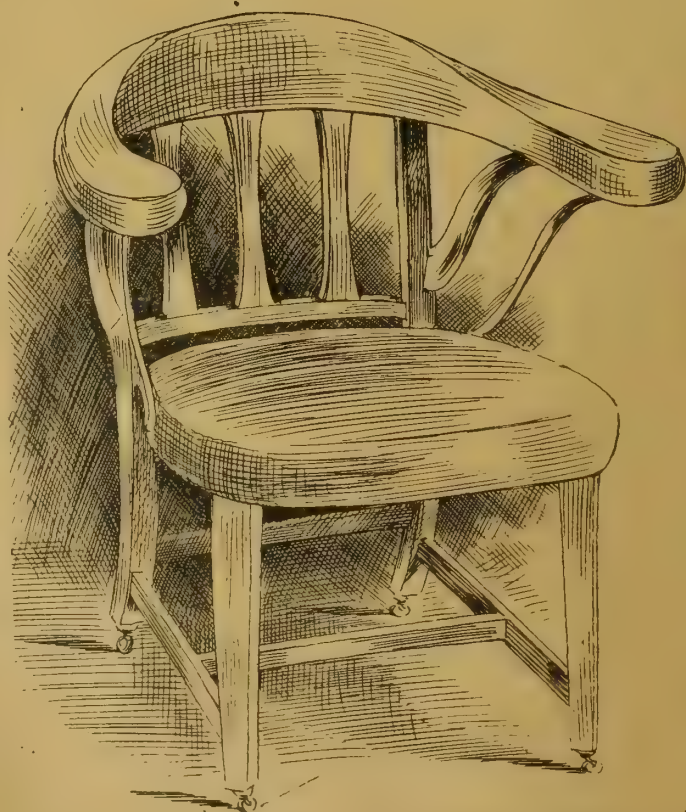


ITALIAN "PRIE DIEU" IN WALNUT WOOD.  
ABOUT 1600

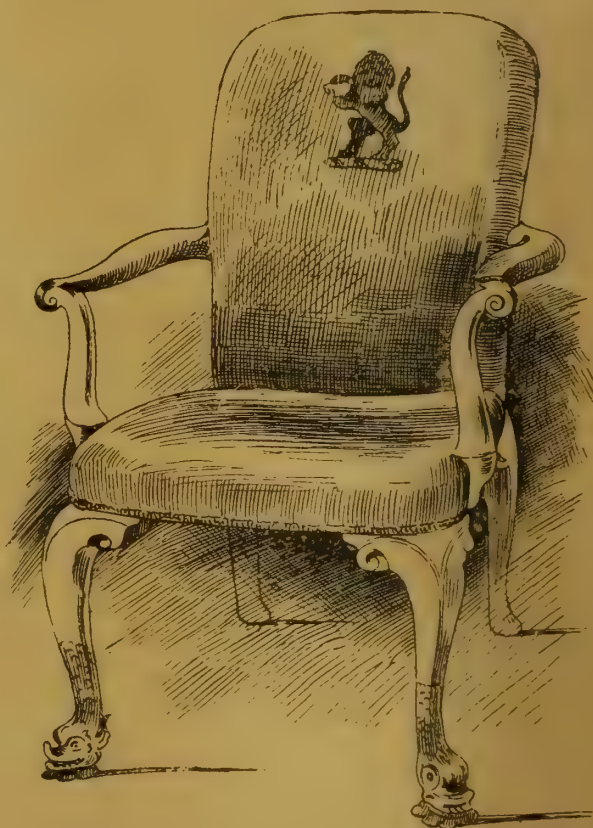


CHIPPENDALE CHAIR

ITALIAN "PRIE DIEU"  
AND OLD-ENGLISH CHAIRS.



SIR ISAAC NEWTON'S CHAIR  
IN THE POSSESSION OF THE ROYAL SOCIETY.



EIGHTEENTH-CENTURY CHAIR  
AT THE INDIA OFFICE

*A. West Chancellor Del.*

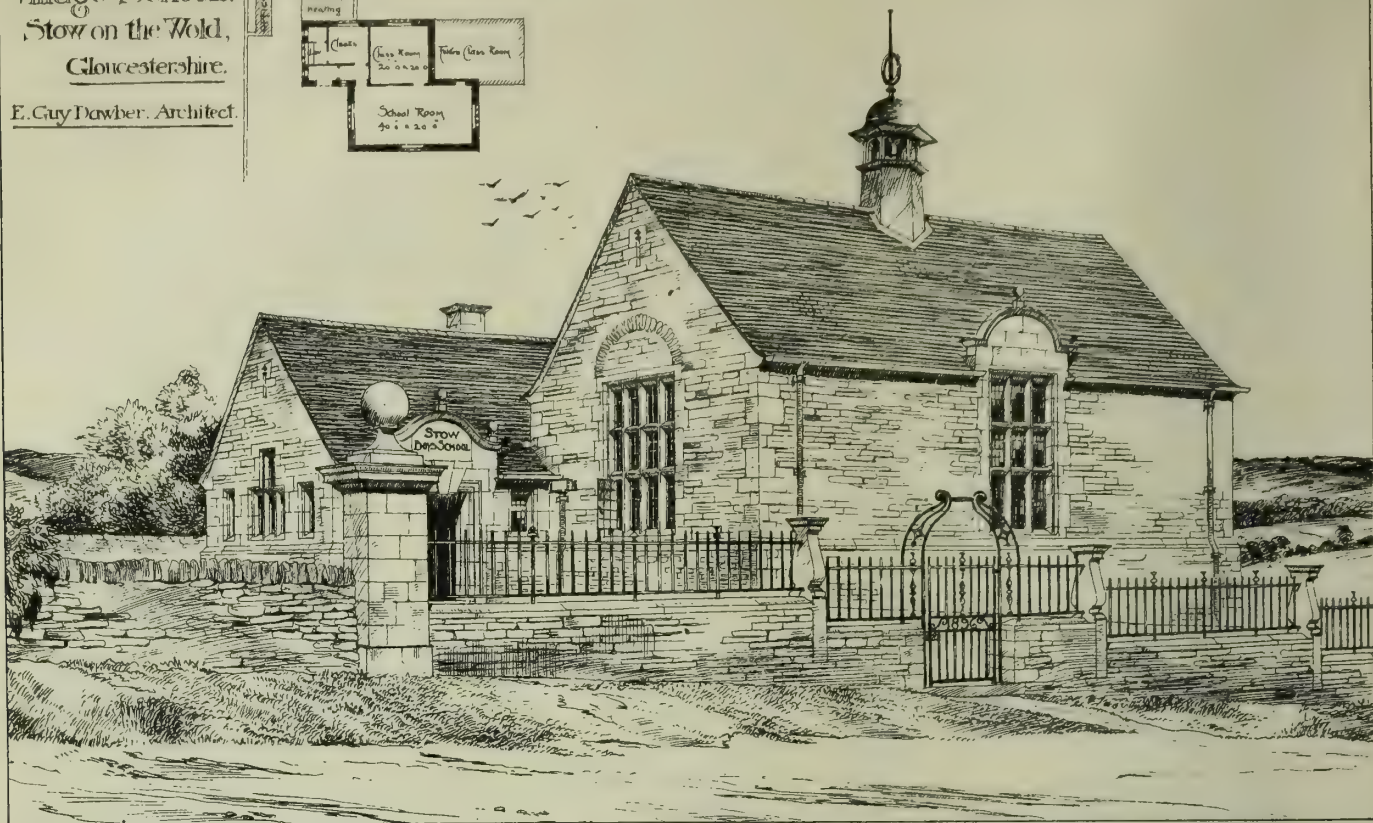
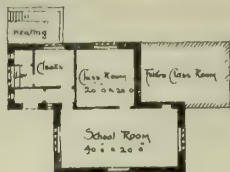




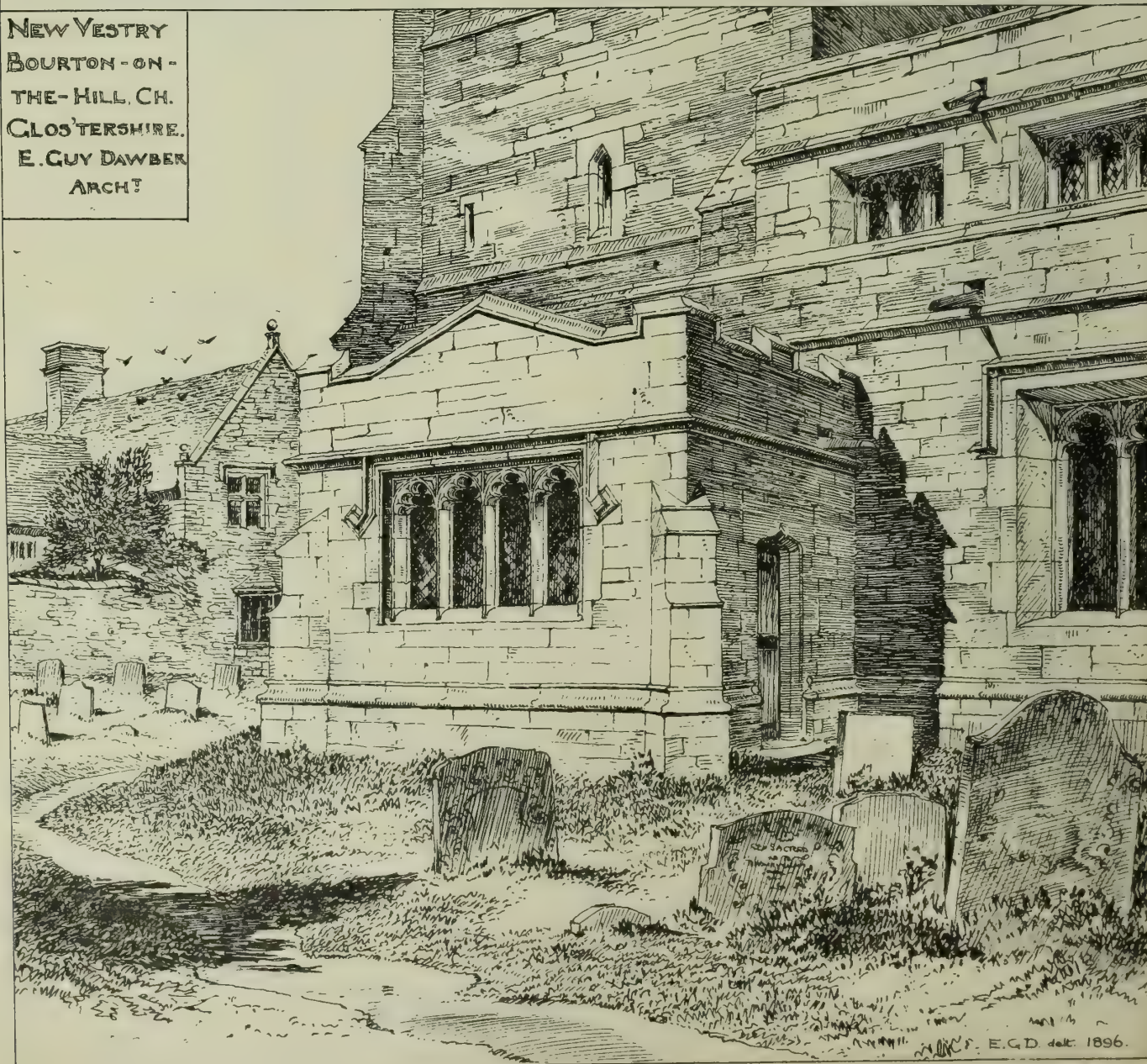


Village Schools.  
Stow-on-the-Wold,  
Gloucestershire.

E. Guy Dawber, Architect.



NEW VESTRY  
BOURTON-ON-  
THE-HILL, CH.  
GLOS'TERSHIRE.  
E. GUY DAWBER  
ARCHT.

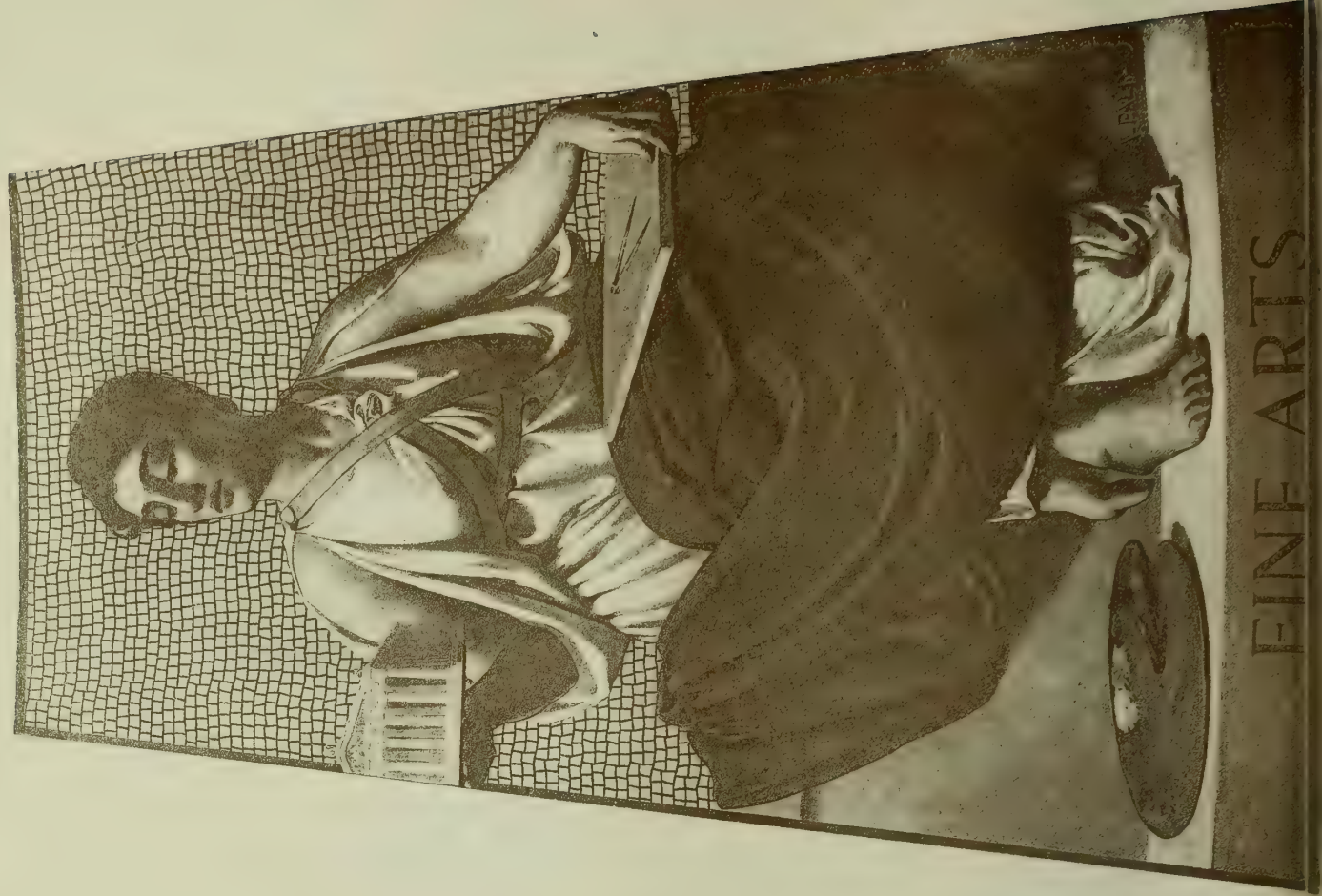
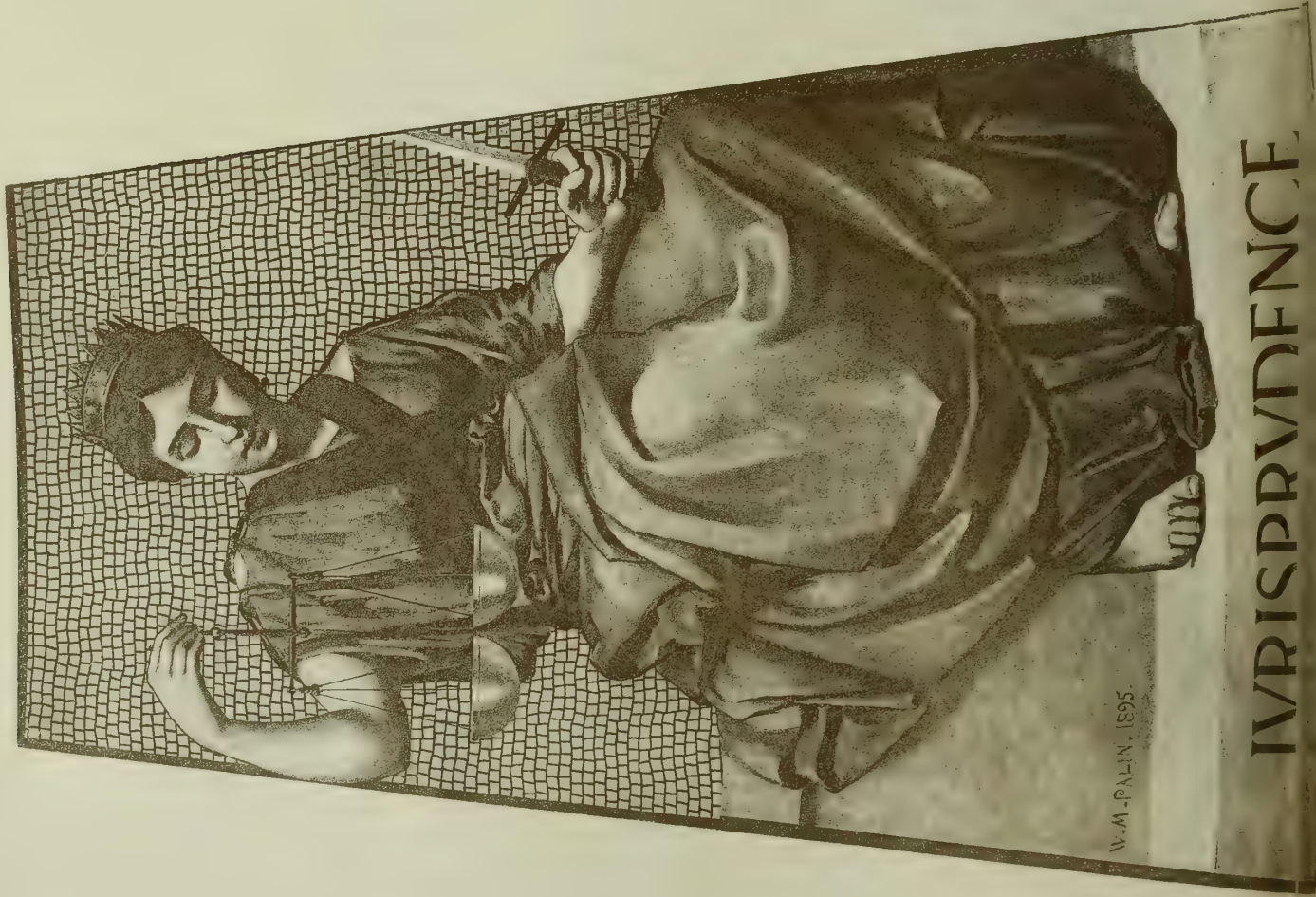


E. G. D. del. 1896.

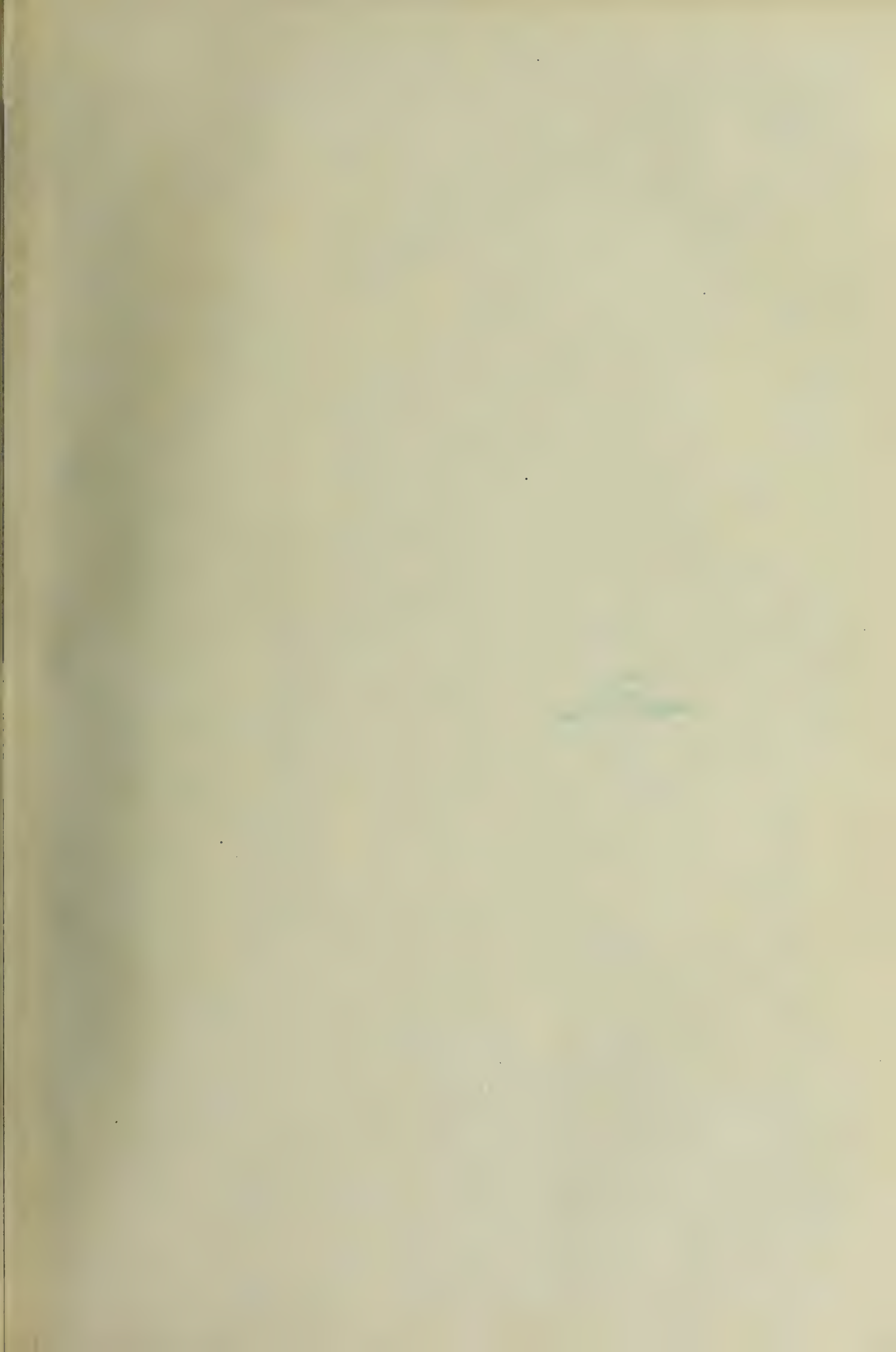




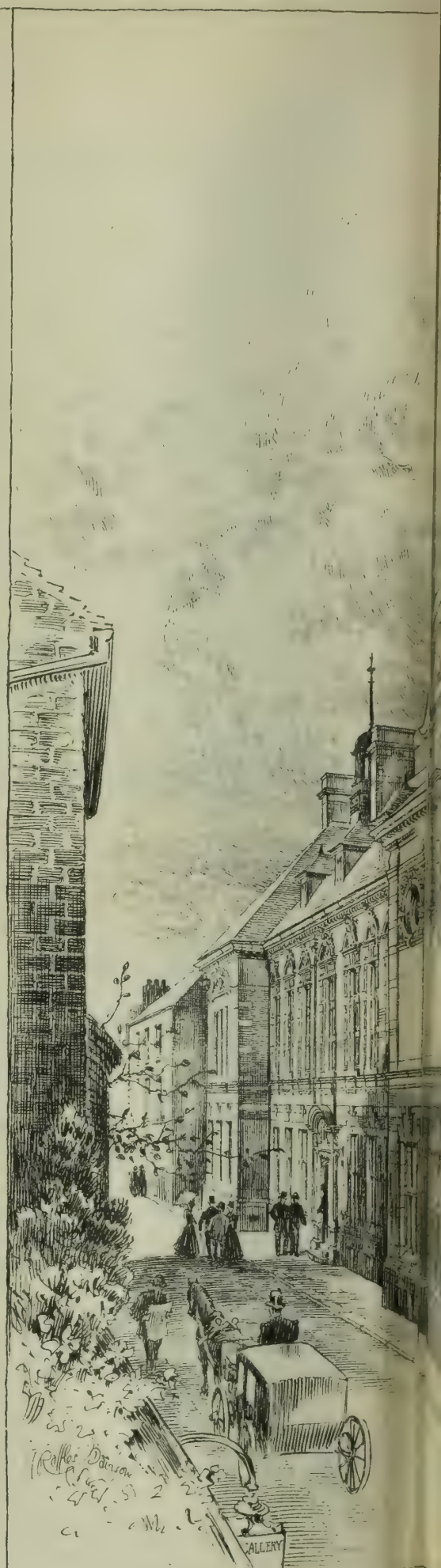
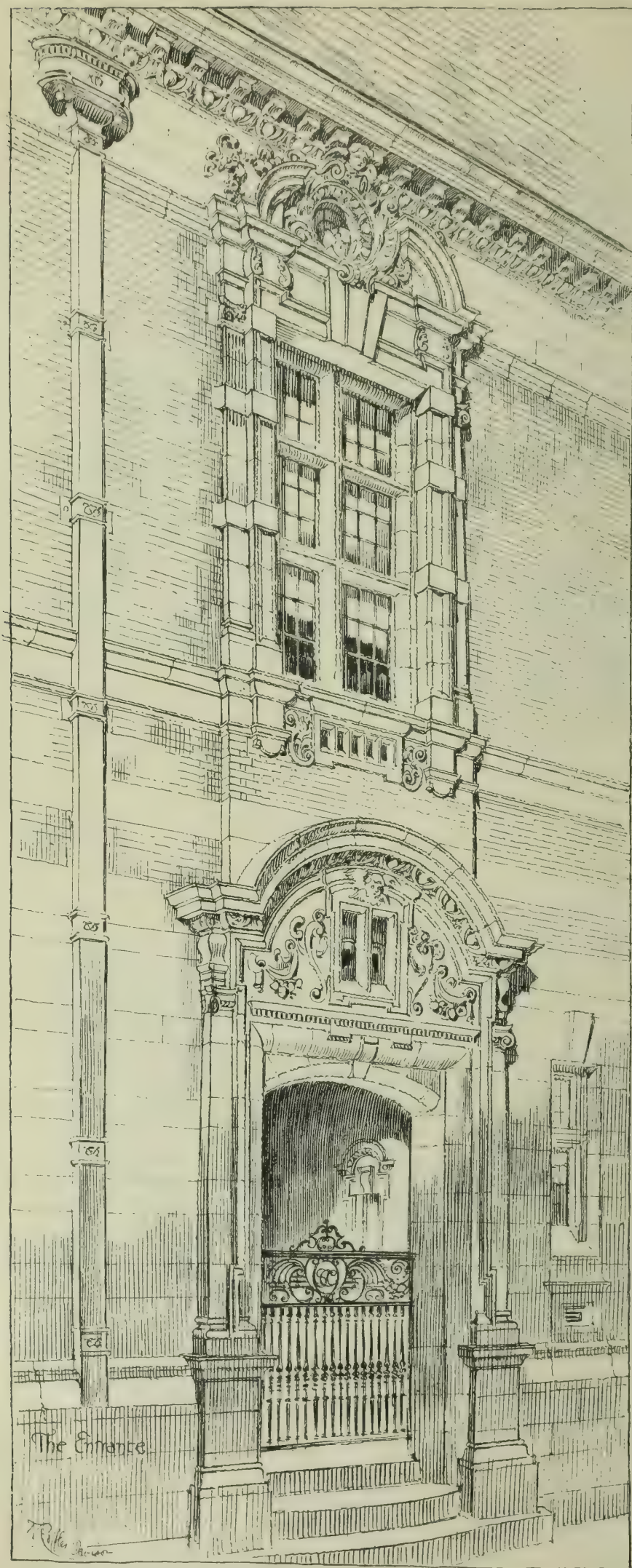




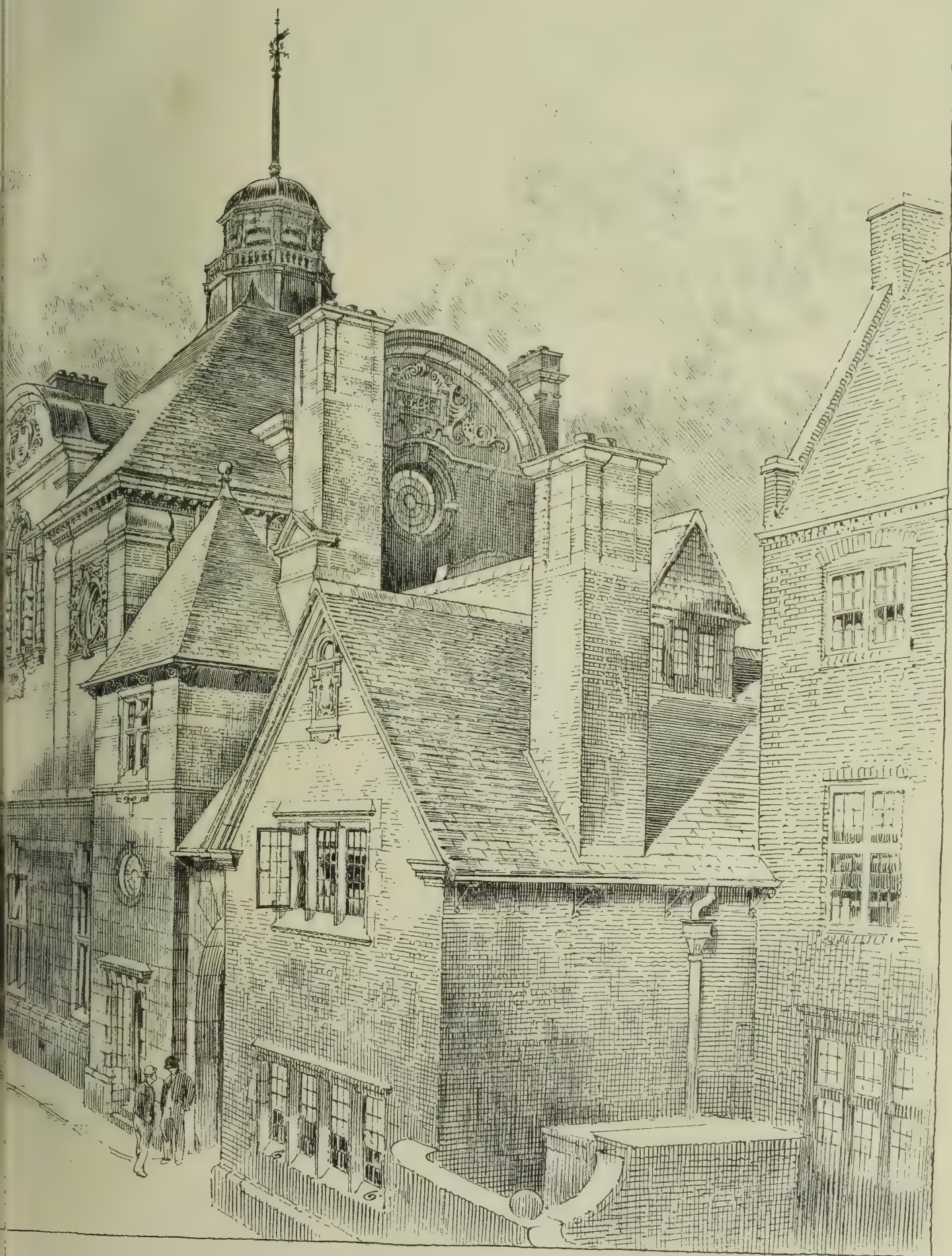












COUNCIL BUILDINGS STAFFORD H.T. HARE ARIBA ARCHT

VIEW













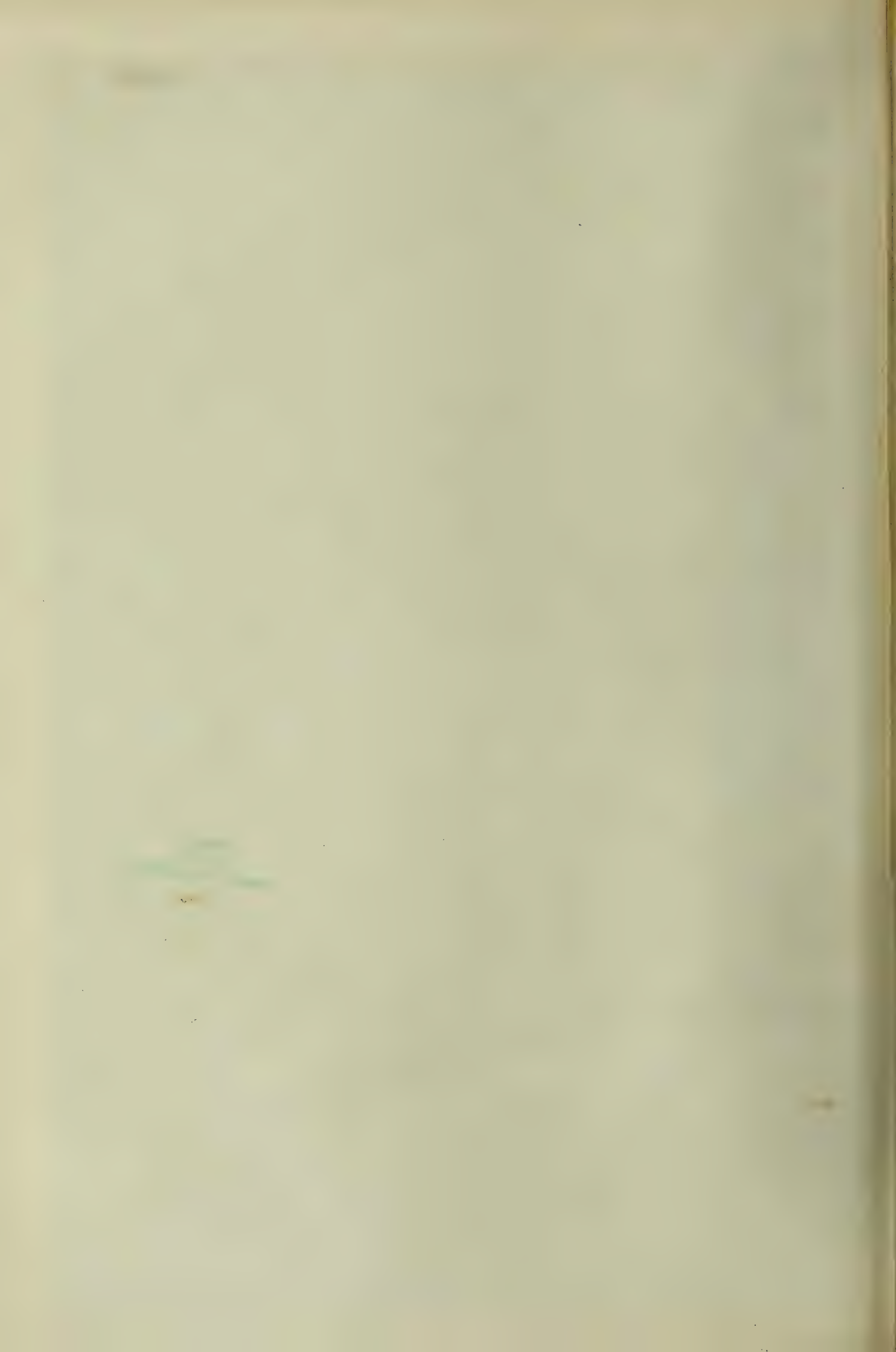
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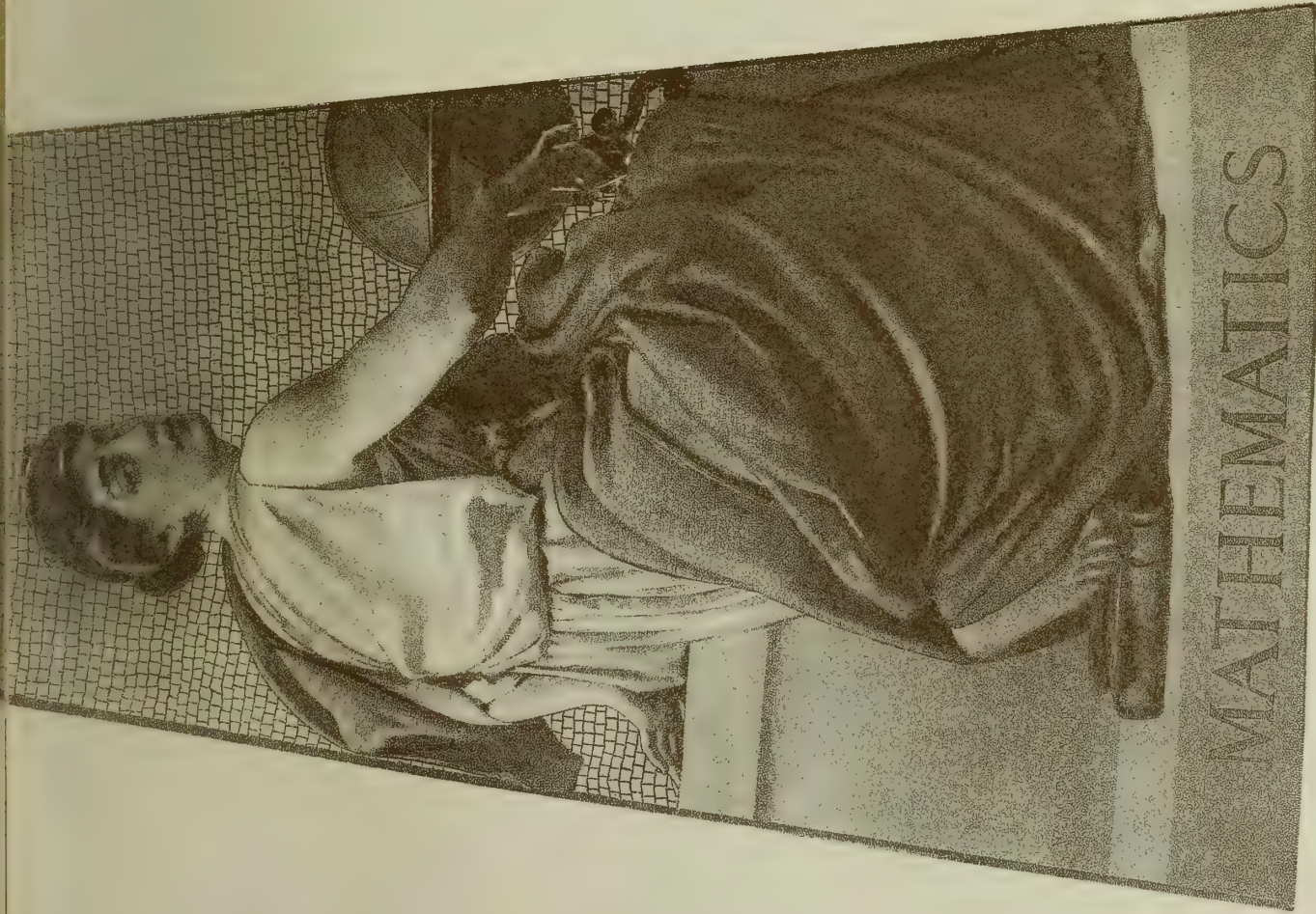
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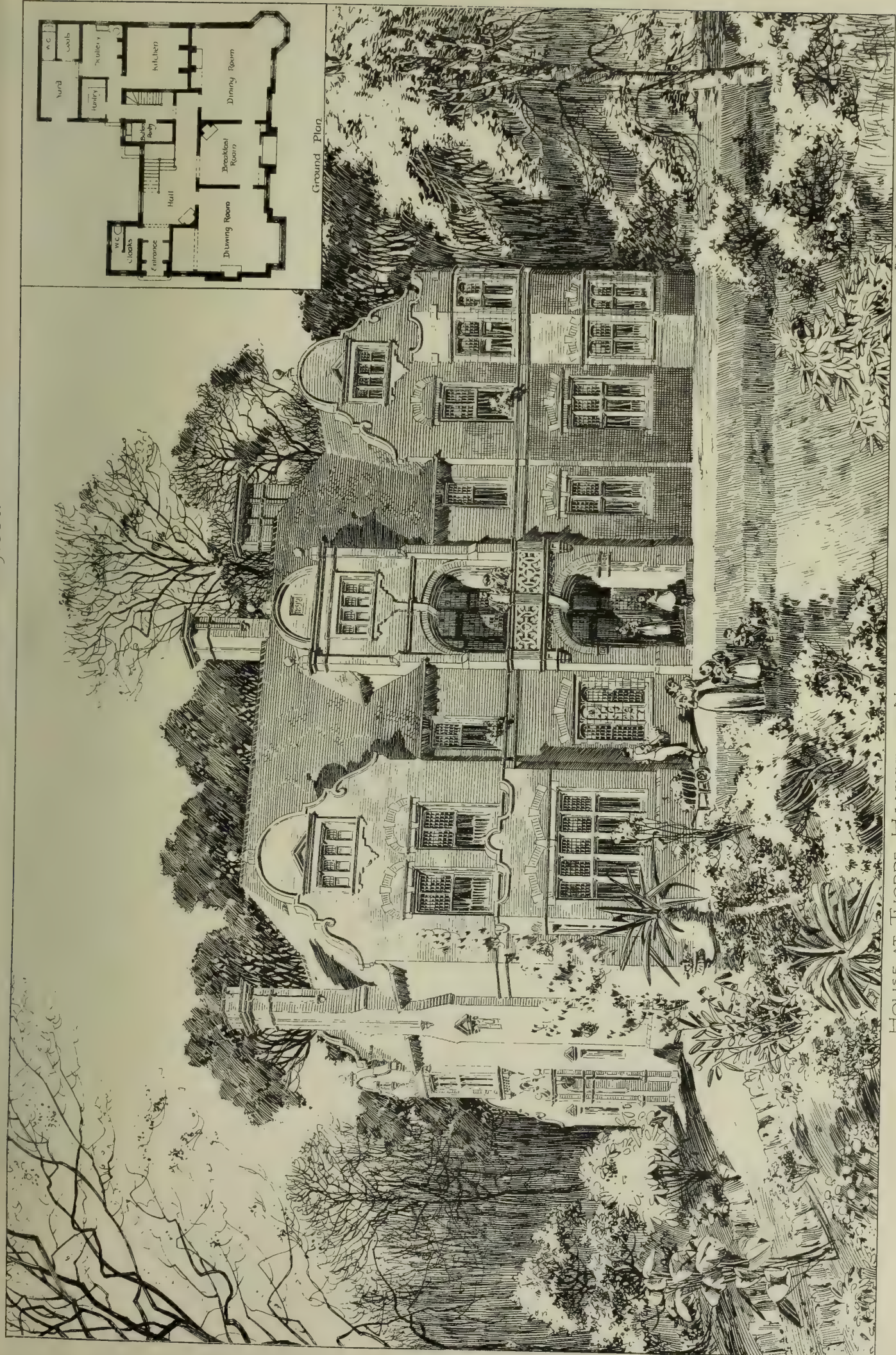


DECORATION FOR THE McEWAN HALL, EDINBURGH UNIVERSITY BY W. M. PALIN  
"PHOTO-TINT" BY JAMES AKERMAN, 6 QUEEN SQUARE, LONDON W. 1









Ground Plan

HOUSE AT THORPE HAMLET N<sup>o</sup> NORWICH MESSRS GEO J & F W SKIPPER ARCH<sup>ts</sup>

Photo Lithographed & Printed by James Alderman, 6 Queen's Square, W. C.

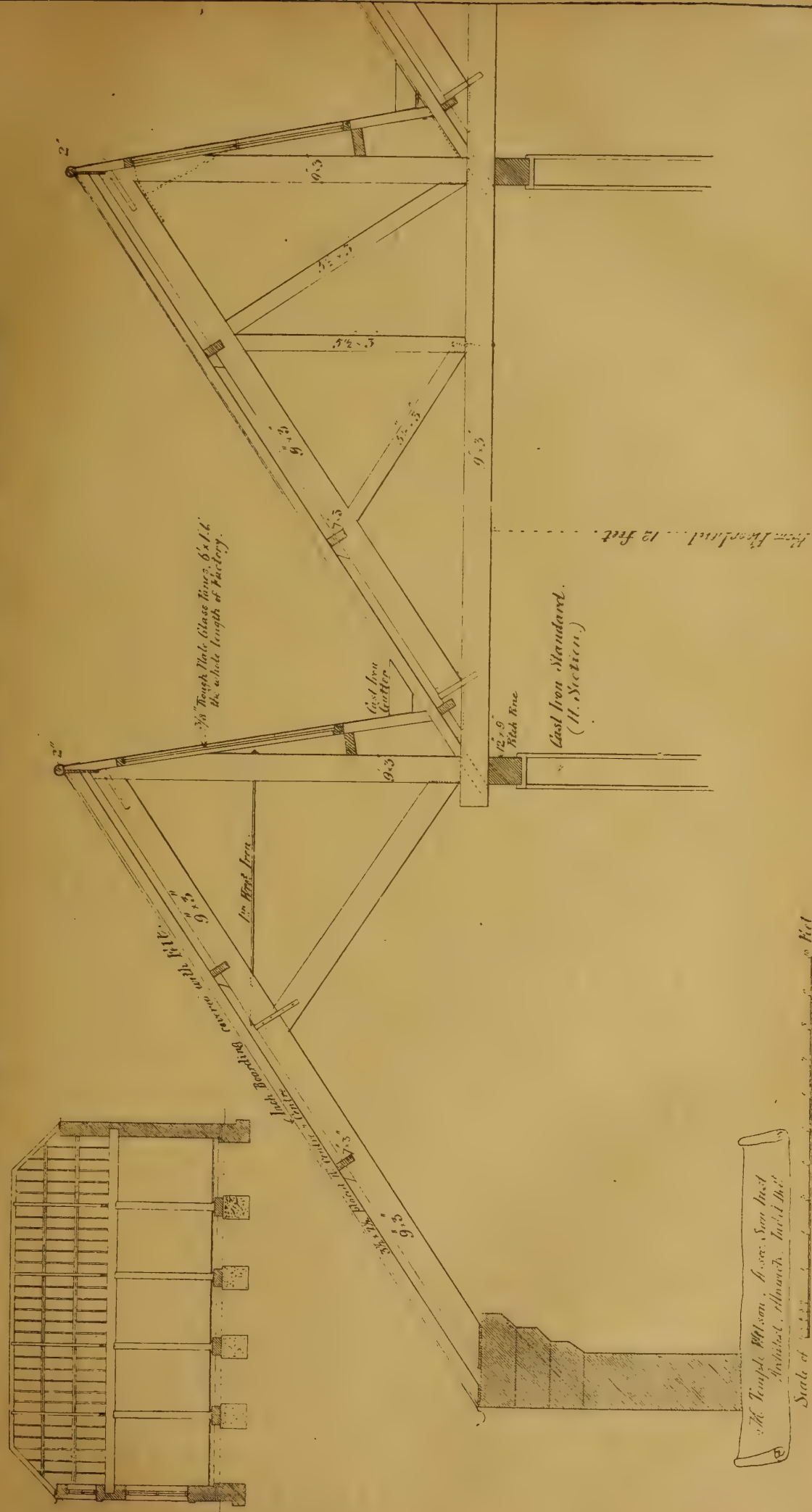






—Cross Section of New Factory Roof on the "Northern Light" Principle.

For the London and North British Works of Messrs Hardy Bros. Alnwick, Northumberland.





## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. J. B. R.—Dextrose.—C. S. and P.—C. Mawson.—J. H. H.—D. R. Co.—Fan Fan.

## Correspondence.

## RE ST. DAVID'S CHURCH, EXETER, COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—As there has been so much misrepresentation upon this matter, I think it may be interesting to know that the building committee have adhered to the award of the assessor, Mr. James Brooks, despite the strong attempt made by others to override it. He placed Mr. W. D. Carvé's design first, and a tender having been accepted for it last week, the objectors on the score of cost were silenced. Mr. Brooks having awarded the second place to my design, D 1, it was on Friday last decided that the second premium of £50 should be paid accordingly. I should not have troubled you with this, had it not been extensively published that the award was different, and these statements were never officially corrected.—I am, &c.,

HARBOTTLE REED.

12, Castle-street, Exeter, Jan. 20.

## CONCRETE TESTS.

SIR,—In your issue of the 15th inst. *re* tests of concrete arching at Mr. Lockwood's yard, Sackville-street, Manchester, and of which I was a witness, kindly permit me to say that the concrete arching for these works was let some months ago, and is taken on the Monier system, consisting of ½ in. round iron rods sprung in between R.S. joists, and interlaced to form a 4 in. mesh. The spans of arching being 12ft. and thickness of arch 3 in., mixed, three of broken bricks to one of cement, and haunches filled in with concrete mixed 10 to 1. I also beg to inform you that the whole of these works,

including the tower, are under the supervision of Mr. F. W. Maxwell, F.S.I., son of the late Mr. James Maxwell, F.R.I.B.A., and of the firm of Messrs. Maxwell and Tuke, architects and engineers, Corporation-street, Manchester.

Sir Benjamin Baker checked the strains of tower, and reported very favourably. Beyond that, he has had nothing to do with these works.—I am, &c., J. ASHLEY, Clerk of Works. Tower Works, New Brighton, Jan. 19.

SIR,—In a report in your last number of some tests which we made on two systems of concrete flooring, you state that the New Brighton tower is being carried out under the supervision of Sir Benjamin Baker. Will you allow us to point out that we designed, and are carrying out this structure, as well as the surrounding buildings, and the whole work on the estate? A publication of this correction will oblige.—We are, &c.,

MAXWELL AND TUKE.

41, Corporation-street, Manchester, Jan. 19.

## A WARNING.

SIR,—In the interests of fellow quantity-surveyors we think it right to inform you that a man called on us on Wednesday last professing to be an architect, and proposing to place a job in our hands for quantities. He promised to bring the drawings to-day (Tuesday). He said he had been sent to us by an architect who is known to us—one well-known in the profession. Before he went he borrowed money, with the plausible excuse that he had left his overcoat, which contained his money, at the dentist's.

One Monday one of us happened to be at another surveyor's office, when this same man turned up with the same tale of the job he proposed to bring, and with an introduction from another well-known architect. It appears that neither of these architects knew him personally, though he called on them both, and asked them to recommend him a surveyor. It is needless to add he failed to keep his appointment with us.—I am, &c., SURVEYOR. Jan. 19.

In the Court of Appeal, before the Master of the Rolls and Lords Justices Lopes and Chitty, an appeal has been heard of the Conservators of the Thames against a judgment of a Divisional Court holding them to be liable for assessment to Poor Rate in respect of the building containing their offices on the Victoria Embankment. Their Lordships dismissed the appeal.

Colonel J. D. Hasted, R.E., an Inspector of the Local Government Board, will hold an inquiry in Leeds to-day (Friday), relative to the application of the Leeds Corporation for sanction to borrow £100,000 for purposes connected with the City Gas-works. A considerable portion of the money is required to pay for the new stoking machinery which is being introduced at the works at New Wortley, for the new retorts at Meadow-lane, and for the additional coal stores that are being provided at the different works.

The new Established Church at Skipness, Argyleshire, was formally opened on Wednesday week by the Rev. Dr. Blair, of Edinburgh. The church is from the designs of Mr. B. V. Johnston, Victoria-street, Westminster. A feature of the building is a large stained-glass window, presented by Mr. Graham, of Skipness, in memory of his mother. Mr. Graham, who designed the window, is a well-known writer on Celtic art, and the conventional lines of the scheme are lighted up by drifts of rainbow colour.

In the Bristol Bankruptcy Court on the 15th inst., the case of E. T. Hatherly and Henry Carr, trading as Hatherly and Carr, 39, City-road, Bristol, builders and contractors, was investigated. Mr. Watts appeared for the trustee, and stated that an adjournment would be necessary, as the accounts filed were very voluminous, and comprised about 10,000 items, and would require to be gone carefully through. The examination was adjourned to February 26.

The Bridport Church Restoration Committee have accepted the tender of Messrs. F. Merrick and Son, ecclesiastical builders, of Glastonbury, for the sum of £745. Tenders were also received from Messrs. A. Poole, Ilminster; A. H. Green, Blandford; the Ham Stone Company; R. B. Brooks, W. J. Cooper, and T. Patten, Bridport; and Hy. Bartlett, Shipton. It is hoped that the work will be commenced in March and finished by September, but it will not interfere with the Sunday services. The architect is Mr. C. E. Ponting, diocesan architect, Marlborough, and the restoration includes the tower and the north and south transepts.

## Intercommunication.

## QUESTIONS.

[11610.]—**Quantities.**—(1) What are quantity surveyors' usual charges now current from, say, £100 to £100,000 contracts? (2) Do their charges include lithographed copies? (2) How far are they liable for errors?—ARCHITECT.

[11611.]—**Boundary.**—I am about to erect a brick wall against an adjoining property, which at present has the boundary defined by a close fence, belonging to the adjoining owner. It is necessary to build right up to this fence. Am I right in encroaching the footings of the new wall over my boundary, as this will be necessary if I am to take advantage of the whole of the land, otherwise there will be a space left between the boundary and the wall?—IGNORAMUS.

[11612.]—**Cement Floor.**—Should Portland cement paving lin. thick, finished with trowelled face, be laid in one thickness or two? I have seen it laid in two, a thin coat being put on to form face after the under thickness was nearly set. Does this make as strong a job as if it was finished in one thickness? What proportion of sand to cement should be used?—DOUBTFUL.

[11613.]—**Cleaning Headstones.**—Will some reader tell me the name of the liquid that some stone-masons use in recleaning headstones with? It seems to bleach it in a few minutes to its natural colour, or if it touches granite it almost bleaches it white.—R. MELLON.

## REPLIES.

[11609.]—**Architects' Bookkeeping.**—If "F. G." will write, I think I can assist him. I have also a good system of builders' bookkeeping, and shall be pleased to supply any reader of the "B.N." with full-sized worked sheets of the system.—F. J. WEBBER, 19, Leinster-road, Rathmines, Dublin.

## CHIPS.

The Bognor Urban District Council have adopted the pier plans prepared by the surveyor, Mr. Bridges, and the work is estimated to cost £5,000.

The Surbiton District Council have received a letter from the Local Government Board, sanctioning the loan of £1,100 for the Tolworth sewage farm, for which they applied in August last.

A sub-committee of the Edinburgh Town Council remitted to the city superintendent on Monday to prepare a probable estimate for carrying out the plans of the new fever hospital. Alternative estimates for 600, 500, and 400 beds are to be prepared.

Colonel C. H. Luard, R.E., held an inquiry at the National Schools, Darfield, on Tuesday, for the purpose of hearing reports respecting an application made by the Darfield Urban District Council to borrow £3,000 for the purchasing of the "Poplars" estate, street improvements, allotments, recreation-ground, and public offices.

Mr. H. C. Eyres, whose resignation of the management of the Coalbrookdale Company's London business and appointment to that of the architectural department of the Falkirk Iron Co. we recently noted, was on Saturday last entertained by the Coalbrookdale London staff and presented with an illuminated address, together with a handsome piece of plate.

The Queen has been unable to accept the invitation of the Oxford City Council to open new municipal buildings which are just being finished from Mr. H. T. Hare's designs. The Prince of Wales has consented to take the Queen's place.

The special committee of the London County Council, which is inquiring into the management of the Works Department, sat again on Wednesday, when Mr. Haward, comptroller to the Council, was further examined, and evidence was also given by Mr. Jacobs, a foreman in the department, and Mr. H. Ward, chairman of the Works Committee.

The next ordinary meeting of the Society of Architects will be held at St. James's Hall, Piccadilly, W., on Thursday week, at 8 p.m., when Mr. Thackeray Turner, secretary of the Society for the Protection of Ancient Buildings, will read a paper entitled "Restoration."

The promoters of the Bill for powers to construct a railway from Macclesfield to Leek, in Staffordshire, have given notice of the abandonment of this scheme for the present session. The share and loan capital which was proposed to be raised for this line was £600,000.

A pre-Reformation altar-slab has been discovered in the eastern chapel at Peterborough Cathedral. It measures 8ft. 6in. by 3ft. 5in., and has its traditional five crosses well defined, with a sixth upon its bevelled front edge. The Dean and Chapter contemplate setting it up in the southern chapel at St. Oswald.

The city council of Leeds have accepted Mr. Alderman Hardy's generous offer to adorn the City-square with an equestrian statue of Edward III., designed and modelled by Mr. T. Brock, R.A., and also with eight bronze lamps.



## LEGAL INTELLIGENCE.

**CONSTRUCTING FLOORING.**—At the City of London Court, on Jan. 13th, before Mr. Assistant-Registrar Tattershall, the case of the "Wood-Block Flooring Company v. Beale" was heard. The plaintiffs in this case, of 11, Queen Victoria-street, sued the defendant, George W. Beale, of 505, Cambridge-road, builder, for £14 9s. 4d., the balance of a sum of £29 9s. 4d., due for flooring laid at 55, Well-street, Hackney. The defendant had paid £15 on account, and since the action was brought had also paid into Court £4 9s. 4d., thus disputing £10, which, by his counterclaim, he claimed as damages arising from the negligence of the plaintiffs in improperly laying the flooring. He alleged also that the architect employed by the owner of the premises, where the work was done, declined to certify for the balance of the contract price of the work, and deducted the £10 from the contract price. Both plaintiffs and defendant were represented by their respective counsel, and a considerable amount of correspondence which had passed between the parties was read. The work done consisted in constructing the flooring of a workshop (136 super. yards in size), and counsel for the plaintiffs called Mr. Alfred E. Geary, a member of the plaintiff company, who proved the request for a quotation, the giving of the quotation, and the final acceptance of it. The witness stated that he inspected the flooring on its completion, and found it perfectly satisfactory. The work was completed on May 23, and no written complaint was received until some months afterwards. Mr. G. R. McKinsey gave evidence as an expert that he had inspected the flooring, and found it in a very satisfactory condition. Counsel for the defence said that the complaint made by his client was that in many places the wood blocks were not fitted close to one another, and that the spaces so occurring had been filled in with strips of wood, many of which had sunk since they were put in, the result being that the floor was rendered uneven. The only remedy for that state of things was to take up the whole of the flooring and relay it. Immediately after the flooring had been completed a tenant took possession of the premises, and he had continued to carry on business there up to the present time. Mr. Cole was then called, and produced certain tracings taken from the flooring. These showed the space between the blocks. One of the blocks with the inlet attached was produced for the Assistant Registrar's inspection. The witness spoke as to the general uneven condition of the flooring. Mr. Hamilton, the surveyor employed by the trustees of the property, gave evidence as to his seeing a part of the flooring put down. The first portion was correctly done, but the latter part was, in witness's opinion unsound. Many of the inlets had already sunk, and the whole difficulty was caused by the blocks not being of the same size. The blocks were of inferior wood, and too soft for the purpose for which they were used. The architect's certificate passing the work was given, notwithstanding the making of the complaint, and, as a tenant went in at once, no opportunity had been given to the plaintiffs to rectify any mistake they might have made. The Assistant Registrar pointed out to the defendant's counsel that the counterclaim, if sustainable at a future date, was certainly at the moment premature, inasmuch as no chance had been given to the plaintiffs to make good the work objected to by the defendants. Even if that were now to be done, it would be difficult to get over the fact of the architect's certificate having been given. The better course would be to give judgment for the plaintiffs for their claim, and reserve the counter-claim, which would enable the defendant to bring his action for damages later on, if he thought it worth while. Judgment was entered accordingly in favour of the plaintiffs, and the counter-claim was reserved.

**T. DREW-BEAR, TOLPUTT, AND BROWN V. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON.**—The hearing of this important case, the earlier stages of which we reported in our issues of July 17 and 24 and November 20 and 27, 1896 (pp. 98, 133, 755, and 769 last volume), was resumed on Monday last, the 18th instant (and is still in progress), at the Old Bankruptcy Court, Portugal-street, W.C., before Mr. Edward Ridley, Q.C., sitting as the Official Referee, having been adjourned from November 27th. It was, it will be remembered, brought by several builders' merchants, suing as trustees of creditors of William Brooks, of Folkestone, builder, against the Guardians of the Poor for St. Pancras, and their architects, Messrs. A. and C. Harston, for a balance of £24,226, or alternately £24,265, alleged to be due on a building contract for the completion of St. Pancras Workhouse. Mr. Reginald Bray and Mr. A. A. Hudson appeared for the plaintiffs; Mr. English Harrison and Mr. W. Moyses for the defendant guardians; Mr. A. G. McIntyre and Mr. R. W. Turner for the defendant architects. The case for the plaintiffs is that some years ago the St. Pancras Guardians resolved to reconstruct their workhouse premises in King's-road, Pancras-road, and appointed Messrs. Arthur and Christopher

Harston, of Leadenhall-street, E.C., as their architects. Quantities were duly taken out on Messrs. Harston's plans by a firm of surveyors, and the original contract for certain sections of the work was undertaken by Messrs. Kirk and Randall, of Woolwich. Disputes arose, and in 1892 Messrs. Kirk and Randall desired to be relieved of further duties under the contract; fresh tenders were invited for the completion of sections 1 and 2, and that of a Mr. William Brooks, of Folkestone, was accepted for £50,861. Brooks's contract was to have been completed in 15 months from May, 1892; but delays arose, and in November, 1894, the work was stopped. Messrs. Drew-Bear, Perks, and Co., 71A, Queen Victoria-street, E.C., who supplied the ironwork, Mr. Henry Tolputt, of Folkestone, who supplied the timber, and Mr. James Brown, of Cannon-street, E.C., and Baintree, who supplied some of the bricks, now sued as trustees of the creditors of William Brooks for £24,226, or alternately £24,265 balance alleged to be due to Brooks. The first claim was made up as follows: net cost of executed work £65,479 plus 10 per cent. profit £6,547, making £72,026. On this account it was agreed that £47,800 had been received on account under the architects' certificates, leaving a balance claimed by plaintiffs of £24,226. The alternative claim estimated the net cost of the work executed at £65,479, as before, but reckoned the 10 per cent. profit to be added on a basis of the contract price of £50,861, so that £5,086 (in lieu of £6,547) was claimed to be added to the net outlay, making, with £1,500 claimed for damages, the total of £72,065, and the amount claimable, after allowing for the £47,800 already received under the architects' certificates, £24,265. In addition, plaintiffs claimed 5 per cent. interest from the stoppage of the works at the end of 1894 to the date of hearing. Mr. James Brown, brick manufacturer, cross-examined by Mr. Moyses, said the Amphill trap was constructed according to a patent which had run out. Witness never made any complaint about the trap to the guardians, although it was mentioned at an interview, nor did he recollect any direct complaint about the trap. The complaint as to the plaster-work was raised by witness at a meeting of the guardians at which Mr. Boden, the chairman of the building committee, and Mr. Roberts were present, convened to hear the complaints as to delay. From his experience he knew that sub-contractors coming on to the works always caused a certain amount of inconvenience, but in the present instance the sub-contractors' work was of a very extensive kind, and occasioned enormous delay. Witness was further cross-examined as to the decision of the creditors to proceed with the work. Witness said he informed the guardians that the creditors could see a margin of profit in the job, and would supply materials, and the guardians agreed to assist them financially, instructing Messrs. Harston to give certificates as close up to the value of the work as they could. If witness had then known that the ironwork had been condemned by Poole he should have hesitated before ordering the creditors to go on. Cross-examined by Mr. MacIntyre, witness was asked whether the builder was entitled to say that he was to be the judge of the quality of bricks to be used. Witness replied that he did not think the architect was entitled to read his specification unfairly. He considered that a stock facing brick that would fairly meet the requirements of the specification for the St. Pancras Workhouse contract could be bought throughout 1893 at 35s. per 1,000. As to the flooring objected to by Poole, he thought that a board like sample produced, showing 4in. of sap-edge, should have been passed. The delay as to the drainage in H block was due to an old drain which leaked into the trenches, and which the clerk of works, Poole, allowed to remain open three weeks; whereas when Mr. Harston came on the job, he settled the point in a few minutes by allowing the contractor to divert the water into another drain. It was not the contractor's duty to deal with the matter without instructions. Mr. Harston came directly witness wrote to him; but witness considered Poole should have settled the point without delay. Witness had no difficulty personally with Mr. Harston, except that he was a little stiff in his interpretation of the specifications; witness wished he had applied to him oftener, as whenever he came on the works, Mr. Harston always settled a point Yes or No, so that the builder, whether the decision were against him or not, was benefited, as he could then get on. Witness was cross-examined in great detail as to the variations in the amounts claimed. Re-examined by Mr. Reginald Bray: During the execution of this contract great inconvenience, delay, and cost were caused by the slow progress of special sub-contracts, covered by provisional items, especially in sinking a well, supplying laundry fittings. In most other cases provisional items were ordered by the contractor, who was then master of the situation; but in this case Messrs. Harston retained the sub-contracts in their own hands, thus allowing of delay. Witness found that bricks which he regarded as sound were condemned by the clerk of works after they had been built into the walls; they showed no chipping on the face.

The Official Referee: I assume you, Mr. McIntyre, were in ignorance as to the facts, but this is an extraordinary procedure according to present evidence. Mr. McIntyre: Of course, sir, I cannot deal with my case piece-meal. The question was, whether the contract should be carried on according to specification or not. The Official Referee: But so far as the case has gone, the requirements seem to me to be as stringent as if for Houses of Parliament, whereas this is a workhouse. You will see that the architects are not charged with fraud or collusion, but with over-particularity. That is the point to which I would direct your attention. Mr. Bray, re-examining, asked witness what was the general reputation of Messrs. Harston with regard to their dealings with builders. Mr. MacIntyre: I object to this. Mr. Bray: But it arises out of your cross-examination, and I must persist unless you withdraw that from your case. Mr. MacIntyre still protesting against the question, the shorthand reports of the last hearing were read, from which it appeared that witness stated in cross-examination that Messrs. Harston bore a very high reputation as architects, and had been employed in that capacity for similar buildings to St. Pancras Workhouse by the Metropolitan Asylums Board. The Official Referee thereupon ruled that the question was admissible. Witness, in reply, said: Messrs. Harston's general reputation with reference to their dealings with builders was that they were hard, severe, and he thought he might use the word exacting. They would always do their duty to their clients. When discussing this contract with Messrs. Harston, one day in 1894, Mr. Arthur Harston said, in witness's presence, to his brother: "There is another builder failed that is working for us; that makes three." Cross-examined: Witness believed the three builders were Brooks of Folkestone, Holland of Poplar, and a name which he would give in writing to the Referee and counsel, as he was not sure of it. Arthur Edward Brown, B.Sc., son of last witness, said he was the manager of the brick manufacturing department for his father. Witness supplied red bricks for the St. Pancras buildings for Kirk and Randall, and their successor in the contract, Brooks. In consequence of complaints witness went over the works August 25, 1893, and inspected a stock of bricks and a wall being built, with Fearon and Poole. A portion of the bricks had been damaged in transit. There was cause for complaint, but not for refusing their use. In this case the damage was more than usual, but the stock of bricks ought not to have been condemned as a whole, for the majority had one good face suitable for the works. Poole took witness over the works and showed him bricks marked in blue pencil, and explained that he had instructed Fearon to cut them out, as they were not fit to be in the work. He gave no reason as to their unfitness. Witness could not see any, and told Poole he was not justified in marking them. He lost his temper, and immediately took out his pencil and marked a great many more indiscriminately, saying he would take good care that these, and a good many more, were cut out, and that if witness considered those good bricks, witness did not know what a good brick was. George Andrews, director of Smead, Dean, and Co., brickmakers, Sittingbourne: Fearon ordered of witness, after examining them on the ground, on September 20, 1892, 10,000 facing bricks at 45s. and 24,000 ordinary stocks at 32s. per thousand. Witness was informed afterwards that the bricks were condemned. Malsms were quite a different brick to picked stocks, and would cost, roughly, 10s. a thousand more. A shipper was a harder brick than a picked stock, but not so regular in colour. In this case they were 3s. cheaper, but usually ran about the same. He supplied bricks to the workhouse authorities since the contractors left at 33s. They were not such good bricks, but witness had no complaints. The market price in September, 1892, was 1s. a thousand higher than when the later orders were executed. Cross-examined: The price for picking facings was 10s. a thousand extra. Witness did not know what the later bricks were used for, nor whether Poole was a ill clerk of works. William Franks, foreman bricklayer of 18 years' experience, said he entered Brooks's employ in February, 1893, when he was put on the St. Pancras Workhouse as leading foreman. Witness was told by Poole he must pick over the old bricks purchased of the guardians. Poole continually complained of their use. A certain number of bats were necessarily used in breaking bond. Witness kept on picking the old bricks. The new work was in red rusticated corners and stock panels, and these were objected to by Poole. The colour was not right: they were too rough, and some were chipped—the latter complaint was well founded. Poole marked the bricks he objected to with a piece of black carbon (produced), which left a wide mark which penetrated the material. Poole said stocks were specified, and he would have them. All the bricks used for facings were picked stocks except one lot of golden malsms. Poole objected to the softness of these, and they had to be used for bull-noses in inside work. Of the bricks marked, some were good and some had faults. Witness had



four bricklayers on the ground for six weeks picking bricks, and others cutting out bricks, delaying the removal of scaffolding. On the front of C block Poole marked the whole of a pier, but witness did not pull it down, and it stood there now. It was such a common practice for Poole to condemn work that at last witness took no notice of it. The brickwork was generally well done. The condemnation of the girders also delayed witness. Poole would not allow old bats to be used for inside walls, for breaking bond, but new ones had to be snapped for the purpose.—Cross-examined by Mr. Harrison: If the golden malms had been used they would have looked patchy unless more had been ordered. Witness did not cut out all the bricks condemned by Poole, as there was no real ground of complaint. George Edward Wragg, secretary of Messrs. Eastwood and Co., with 24 years' experience, said his firm manufactured between ninety and a hundred million bricks made by hand at Shoburness. They would vary in quality thus:—malm cutters, main sewers, paviors, shippers, malm stocks, and common stocks, rough grizzles, and placers. The price of malm stocks varied from 10s. to 12s. above stocks. Brooks applied to witness for quotations, but witness declined to supply him. In reply to the Official Referee the witness said the best coloured and most expensive brick was the softest, because to get a hard well-baked brick, the colour had to be sacrificed. The difference between a malm and a stock was that for the former finer firing was used, while more chalk was added to the malm. Witness thought some bricks were used and condemned which, according to the specification, should have been passed. George Armitage, of the firm of George Armitage and Sons, stone merchants, Robin Hood Quarries, Wakefield, supplied stone for the workhouse for landings and staircase work generally. Some York landing was condemned as being laminated, and was examined by witness afterwards, and as he did not see any defect in it, witness went to the architects' office with Poole. Mr. Harston looked at and hammered the stone in order to split it through the laminations, whereas it broke across. All this York stone was laminated. Mr. Harston then told Poole that if the landings were equal to the sample they ought to be used. The landings were, however, condemned, he understood, by Poole, and were carted away from the works, and could now be seen at another builder's yard in London. The piece produced in court and shown by Fearon was a fair sample. Cross-examined by Mr. MacIntyre: The stone for the steps and that for the landings were of two different classes, the latter being laminated, and witness received a complaint calling attention to this fact. He replied that the landings would wear as long as the steps, and that owing to the size (10ft. by 6ft. by 4in.) they could not be got out of the same beds as that for the steps. The landings came from Scot Gate Ash, Pateley Bridge, and were a more expensive and better stone than the steps, which came from Bradford. [Samples produced.] On Tuesday, Frank Trickett, of the firm of Samuel Trickett and Sons, G.N.R. King's Cross, stone merchants, with over 25 years' experience, was called. He examined the samples of York landing referred to by the witness Armitage, examined on the previous day, as having been rejected by Poole, and said it was excellent, hard, laminated material. It was practically impossible to get pieces 14ft. by 7ft. in unlaminated stone, but the laminated stone was nearly twice as strong and durable as the unlaminated. Cross-examined by Mr. Turner: Another sample of limestone grit (rejected from a landing in the workhouse) would flake. There was great difficulty in getting large pieces in unlaminated stone, and when obtained it would not wear so well. [It transpired that the first sample of York stone was one condemned by Poole and passed by Mr. Harston, whereas the second was rejected.] To the Official Referee: The best and highest-priced Yorkshire stone was the laminated. The expression, "free from laminations or other blemish," which occurred in the specification was a very common one; but sandstone would not be supplied for landings. Charles Edward Newman, 18, Ironmonger-lane, E.C., secretary of the Thames Sand Co., supplied seven bargeloads of Thames and pit sand to Brooks for the workhouse. The river-sand came from near Gravesend, and was universally used in the trade. In a commercial sense there was no "above-bridge river-sand" (such as was specified) on sale; very small quantities are obtained for their own use by local builders. The Thames and pit sand supplied by witness was washed and screened by machinery, and was furnished to some of the largest builders. Cross-examined by Mr. Turner: When witness had an order for pit sand he often delivered below-bridge river sand; no salt remained in it. In reply to the Official Referee, Mr. Turner stated that Poole rejected the sand as not being sufficiently coarse. The Official Referee: We have had a very strong body of evidence tending to show that for some reason the clerk of works in this contract rejected every successive material brought on to the works as not good enough. The result seems to have been delay, ruin to the contractor, and gross injustice. Mr. Turner: But

these materials were not according to the specification of Mr. Harston, who surely had a right to demand from the contractor that which he specified. The Official Referee: I shall be glad to hear Mr. Harston in the box. Henry Tolpitt, timber merchant, of Folkestone, one of the three plaintiffs in the action, as a member of the committee of inspection, supplied timber for the works from 1892 till the end. Of the 280 loads of small timber nine were removed, having been stated by Fearon to have been condemned by Poole, and of the 45 loads of large scantlings, 17 loads were sent back, some not being even unloaded. Witness could find no reason for the rejection, as he was supplying Government contracts and other large undertakings. Cross-examined by Mr. Turner: The scantlings were supplied according to specification, and those accepted were identical with the ones sent back, and from the same parcel as imported. Memel timber lying about in the open would be affected if freshly sawn. Witness's firm supplied the whole of the materials themselves from their stock in the Surrey Docks, after being dealt with at the saw-mills. By Mr. English Harrison: The tie-beams were unusually long, and it was difficult to get them absolutely free from sap. It was quite unusual to have so large a proportion rejected. Mr. Daniel Thomas Heaven, timber merchant, Gracechurch-street, and late traveller for Messrs. Baines and Beard, of Reading: Between 1892 and 1894 that firm was supplying, through witness, flooring under this contract. Fearon was particular as to the qualities to be supplied. In April, 1893, in consequence of a letter, witness saw Poole and Fearon, and heard the complaints of the former. Witness afterwards supplied another brand described in the price-lists as equal in quality, and this flooring was also rejected as not being dry by Poole, with whom witness had another interview; they were eventually passed. Alfred Mier, of Mier and Son, timber merchants, King's Cross, gave evidence of a similar class as to the flooring timber he supplied being constantly condemned, until he grew tired of supplying and replacing it. Cross-examined by Mr. Turner: The rejections were so numerous that after a time we never credited the timber in our books till the next load was signed for. The total amount supplied was from £400 to £500, and the firm were creditors for the last £20 or so. George Smith, surveyor, in April, 1894, foreman to Holland, who was then carrying out a contract at the Bromley and Stepney Sick Asylum, Messrs. Harston being the architects. Witness and young Holland went over to see the brickwork at St. Pancras Workhouse, at the request of the architects, as a sample of the brickwork required. The work was done fairly well. The Official Referee: I do not see, Mr. Bray, what your witness is brought here for. Cross-examined by Mr. Turner: The work was done well, including some marked by someone or other with blue marks. (Laughter.) Mr. Turner, to witness: You can stand down. George Smith, foreman bricklayer at the K or laundry block, testified to the delays caused by Poole's complaints as to the brickwork, the levels, &c., and by the engineers who fixed machinery. Witness was closely cross-examined by Mr. MacIntyre as to the way in which Poole condemned the brickwork, especially that executed by a particular workman, one Lightfoot. George Akehurst, another foreman bricklayer, corroborated, and spoke as to Poole's rejection of columns and girders. William John Taylor, another foreman of bricklayers, gave similar testimony. John Walker, general contractor, had a contract with Brooks for making the roads to workhouse; spoke to Poole's complaints as to flints, although they were similar to those supplied at same date to Islington Vestry. He asked leave to withdraw from the contract, but was persuaded to go on. William Brown, general foreman to Brooks from the commencement of the contract, spoke in great detail to the rejection of bricks, timber, and other materials which witness considered good, by Poole, and that bricks and other work were allowed by Mr. Harston to remain, and could still be seen. Another scene occurred between the Official Referee and Mr. MacIntyre, as the latter remarking that whether reasonable or unreasonable, the architect was justified in demanding adherence to the specifications. The learned Official Referee said that an architect was bound to be reasonable; in fact, he must exercise his discretion. So far as the evidence of his numerous witnesses went, no builder was ever more clearly justified. Mr. MacIntyre: Of course, you have only heard the builders' side as yet. The Official Referee: But you have cross-examined them, and I have read all the correspondence. Before rising for the day at the close of the witness's evidence the Official Referee, addressing counsel, said: I should just like to say that while there has been nothing brought before me tending to charge the architects with fraud or collusion, yet there has been a mass of evidence adduced all going to show that they have not exercised their discretion fairly. It is for you to consider your future conduct of the case. Mr. Hudson replied he would bring the plaintiffs' case to a close next morning. On Wednesday morning William Brown, Brooks's general foreman, was cross-examined by Mr.

MacIntyre as to the materials rejected, with a view to show that they were imperfect and not according to specification. Witness admitted that some of the bricks were much chipped, that timber was a little sappy on the edge. Counsel called the witness's attention to two boards cut on the previous day from the roof of Block C of the workhouse. One sample was, he said, sappy, another was all right and only from a young tree. Witness thought that both specimens ought to have been passed. The boards rejected were not worse than these. The counsel then called attention to a section of 9in. wall, five courses high, and 4ft. 6in. long, which had, he said, been actually cut the previous day out of the workhouse, in which the face of the bricks was certainly chipped, while there was no pointing. The witness said this was a very good sample of brickwork for a 9in. wall, and that the back of the wall was being shown. The specimen was turned round, when this proved to be the case, the other face being unchipped, pointed, and in good condition. As to Poole, he had some friction with him, but he respected him, although one had to be very sharp to compete with him. (Laughter.) Re-examined, witness said: If a small piece of the sample of timber were cut off, the remainder of the wood would last 200 years; the other piece was sappy. Joseph Holland, contractor, carried out works at Stepney in 1892-4 under Messrs. Harston, when questions arose between the architects and witness as to the brickwork. Mr. Harston referred witness to the St. Pancras Workhouse to see the work there as what he wanted, and witness, his son, and the witness, George Smith, went over and inspected the brickwork there. Edward Massey, of the firm of Goddard, Massey, and Warner, of Nottingham, iron-founders, cast 64 columns for the workhouse to the order of T. Drew-Bear, Perks, and Co. On receiving a complaint as to eight of the castings, witness examined them with Mr. Drew-Bear at the workhouse, and as he could find no fault in them, witness refused to replace them without fresh payment, and was agreed to by Messrs. Drew-Bear, Perks, and Co. Witness wrote very strongly, as he felt unjustly treated, and the columns were kept on exhibition at his works. (Letters were put in, but objected to and withdrawn.) Charles Shalto, employed by Messrs. Goddard, Massey, and Warner, accompanied the last witness to St. Pancras, and confirmed his statements. Cross-examined: Eight columns were rejected as not being good enough, and seven others because they had no lugs on. William James Bradshaw, manager for Messrs. Kirk and Randall, with whom he had been for the past 27 years, and one of the selected candidates for the post of manager to the London County Council? Witness was frequently on the works at St. Pancras when his employers held the contract for the first portion of the workhouse. Witness was proceeding to state that there were difficulties with the architects, when Mr. English Harrison objected that this would not be any evidence against the guardians, as any dispute thus arising had been settled by reference. Mr. MacIntyre, on the same side, contended that any evidence as to previous disputes was irrelevant, and tending to introduce fresh issues. Mr. Bray said he proposed to show that precisely similar difficulties in delay and condemned materials arose with the previous contractors for the building, and that they at length obtained a rescission of the contract. The Official Referee said he should not allow evidence as to the arbitration; but he must hear the witness, as it affected the conduct of the architects. Witness proceeding, said that when Kirk and Randall had the contract, Messrs. Harston were the architects and Poole was the clerk of works. There were objections raised to nearly all the materials—bricks, ballast, sand, timber, flooring, &c. The contract was abandoned by consent, and the surplus materials were taken over by Brooks. There were also disputes as to other contractors employed by the architects delaying the work. Cross-examined by Mr. English Harrison: In the subsequent arbitration, Kirk and Randall claimed about £4,300, and were awarded £1,580. John Gosby, clerk of works under Folkestone School Board, and general foreman under Brooks at the workhouse from May, 1892, till December, 1894, spoke as to the delay experienced in getting possession of the site, owing to the fact that parts of the buildings to be reconstructed were occupied. He also described in detail the mode in which Poole complained of materials after they were built in. Witness was present when Brooks asked Poole the reason for his treatment of his manager, foremen, and men, and for his wholesale rejections, inquiring of Poole if he wished to ruin him. Witness corroborated the evidence given by the witness Fearon in July and November, 1896, and previously reported. Cross-examined: When witness left the workhouse job he asked Mr. Harston and Poole for a testimonial, but both declined to give him one, the former saying that he did not know enough of his qualifications to give him one. He had not Mr. Harston's letter with him in Court. Mr. MacIntyre read a copy of Mr. Harston's letter to witness, which stated that as he knew so little of the



witness's qualifications, and the St. Pancras job was so unsatisfactory, he did not feel justified in giving the testimonial asked for. The Official Referee: There is no evidence at present that the contract was unsatisfactory. Mr. McIntyre differed. At present the learned Referee had not heard the evidence for the defence. The Official Referee said that, so far as they had heard, the objections were ill-founded. He would not say that things were right to the uttermost farthing; but it could not be said that the job was unsatisfactory. William Brooks, builder, Folkestone, said he had been in business since 1870. The witness Fearon was the practical manager for him of the St. Pancras contract. Witness's overdraft when he undertook the contract was £2,700, and he had book debts of about £200; but the bank held fifteen houses in Folkestone. Cross-examined: The largest contract he had taken before this was the Victoria Hospital at Folkestone, which cost £10,000; and this was his first London contract. He had said that his misfortunes were due to a series of unfortunate circumstances and having to pay trade union rate of wages. The guardians had treated him with great kindness, and Mr. Harston, independent of Poole, had treated him properly. Mr. English Harrison then proceeded to address the Official Referee on behalf of the guardians, dealing with the aspects of the case, as he explained at the outset, not as they affected Messrs. Harston, but only so far as the interests of the St. Pancras guardians were concerned. This contract was one by which the builders undertook to do certain work to "the entire satisfaction" of the architects, it being stipulated that the works were to be executed in the most workmanlike manner, and under the direction and to the entire satisfaction of the architects. In the contract was a clause as to the position of the clerk of works, which was followed by the ordinary arbitration clause. The architects were described to be the sole judges of, and were to determine all differences arising between the parties, and there could be no doubt that they were persons acting as arbitrators or quasi-arbitrators. One clause dealt with the position the clerk of works (in this case Poole) was to occupy, and therefore it was a contract by the builders that the clerk of works was to act in the particular way set forth in that clause—viz., "The clerk of works for the time being shall be considered to act solely as the inspector and assistant of the architects, and the contractor shall afford to him every facility on the work." Therefore Poole was to be the assistant and inspector under the architects, and when materials were coming on to the job he was to inspect them, and, indeed, Poole had to exercise the functions of the architect in ordering extra work to be executed. His power was, however, limited by a section of the clause, it being provided that he should have definite authority to do certain things. Counsel added that it was suggested at one time that the guardians or the architects had been guilty of fraud: but such allegations had been withdrawn from the statement of claim. As it now stood, he contended that neither party to the litigation, neither the plaintiffs nor the guardians, could bring an action against the architects for negligence in arriving at their conclusion. Indeed, there was no warranty that they would bring any skill or care to bear on the case at all. As he understood it, fraud was out of the question; but knowing that, he complained that there was put in the plaintiffs' statement of claim the widest and strongest allegations of fraud, and it was under cover of that allegation that plaintiffs' counsel had put in pieces of evidence which, but for those allegations, ought not, he submitted, to have been put in at all. The Official Referee, interrupting, said he doubted very much whether an architect was not legally bound to bring to bear reasonable skill and care. Mr. MacIntyre: There is certainly a duty upon him to act honestly. The Official Referee: I think the architect is like other skilled people. You say the architect is protected because a clause in the contract makes him an arbitrator; but I cannot help thinking that the arbitrator must bring reasonable skill and care to bear upon his duties, and if he does not do so, it is no decision at all. I have decided that before more than once in this court against the architect, because he had not brought his mind to bear upon it. Do you contend that he can do whatever he likes? Mr. English Harrison: No; I maintain that he must be honest and not guilty of fraud. The Official Referee: Suppose an architect should say—"I know I am an arbitrator, and that nobody can question my decision; I will let the builder know I am master of the situation, and that he is not"—suppose he said that? Mr. English Harrison: Then I should say such an architect was not acting honestly. In that case the builder ought to go to the building owner and point out that he was not being treated fairly by the architect, that he would not have it, and that the building owner must employ another contractor. The Official Referee: But the builder is put under the supervision of the architect under a contract. If he found fault with the architect, what do you think would the building owner say?

He would reply that the architect was the arbitrator, and that, therefore, he could not, as the employer, go into the matter. Mr. English Harrison: Then the law would deal with such a case in this way. If the employer chose to say that, he is in collusion with the architect to defraud the builder, and the law affords the builder the proper remedy at once. The Official Referee: I do not think that is collusion; for the building owner says, "I instruct my arbitrator." If, now, an employer wrote to the architect, "I hope you will decide this point in my favour," and the architect replied, "Oh, yes," that would clearly be collusion; but this is a very different thing. The collusion comes in because the building owner asked the architect to do a particular thing—a very different state of things to that which has arisen here. Mr. English Harrison: I daresay it is; Mr. McIntyre will go into all that. I have no doubt the substance of my friend's contention will be that when Mr. Harston was appealed to he went and looked at the thing; in many cases he overruled Poole, while he did not do so in many other cases. The fact that in some cases the architect affirmed the clerk of works' action and in others disaffirmed it would be strong evidence, that the architect was exercising his functions properly. The Official Referee: But if he rejected in point of fact materials which ought to have been accepted, and so delayed the contract for a material time, and made it impossible for the builder to perform the contract in the way in which it was drawn up, would not such conduct put an end to the contract? Mr. English Harrison replied in the negative. The builder had, he submitted, absolutely contracted with the guardians to abide by the decision of the architect. The Official Referee: That is, such a decision as a reasonable man would arrive at—not however wrong he might be. The Official Referee said that throughout the evidence given during eleven-and-a-half days he had not thus far heard any evidence of scamping. Mr. English Harrison continued to argue that, however negligent or even wrong Mr. Harston's action might be found to have been, the guardians could not be made responsible for that. Indeed, even if the architect had been guilty of fraud, he should submit that the guardians could not be hit for that fraud. He quoted from the book on "Building Contracts," by Mr. A. A. Hudson (one of plaintiff's counsel), to the effect that a contract of agency conveyed no authority to commit fraud, and that liability of the architect who committed fraud was personal to himself, and did not affect the employer unless collusion was proved, in which case the employer would be justly liable with the architect. He further contended that the builders had acquiesced in the decision of the architects, and had not appealed against their decisions to the guardians when it went against them. On the contrary, Fearon had written that he had been "treated with great kindness by Mr. Harston." The learned counsel cited further "Stevenson v. Watson" (Law Reports 4, Common Pleas Division, p. 148), "Pepper v. Rose" (Law Reports 7, Common Pleas, pp. 32 and 525), and "The Pharis Sulphur Co." case (Law Reports 8, Common Pleas, p. 1). In continuing his address yesterday (Thursday), Mr. Harrison pointed out that one of the difficulties of his position was that the board of guardians, being like the ratepayers who elected them, a more or less fluctuating body, the present board was not the one which employed the architects or entered into the agreement with the builders, and therefore the plaintiffs sought to hit a body of gentlemen who were not responsible for the difficulties, and he (the learned counsel) represented a board who were not the persons really responsible for the undertaking. The learned counsel argued at great length that the case for the plaintiffs as to the alleged delay in getting possession of site and interference of sub-contractors and by the clerk of works had been grossly exaggerated by certain witnesses, especially, he alleged, by Fearon. The case was at this stage adjourned till to-day (Friday).

**MERTHYR BUILDING CLUB AND ITS CONTRACTOR.**—Mr. W. M. North (stipendiary) sat as deputy judge at Merthyr County-court on Friday, to hear an intricate case between the Clare Building Club, Merthyr, and their contractor, Mr. Thomas Rees, Merthyr Vale. Mr. Rees claimed from Mr. Nathan Warlow, the architect of the club, £20 5s. 4d. as the balance of account rendered and for the hire of a stone-crusher. There was a counter-claim for £20 for alleged damage to road, and £5 for rent of the ground on which the crusher was placed. The plaintiff then put in another counter-claim of £20 as portion of an amount of £70 15s. due from the trustees of the club. These counter-claims were dismissed, as they were matters of account between the parties, and judgment was given for plaintiff for £19 6s. 6d. in respect to the hire of the stone-crusher.

**IN RE G. J. CLARK.**—At the Kendal Bankruptcy Court on the 15th inst., George James Clark, architect and surveyor, of Bowness, was examined. His gross liabilities amounted to £228 9s. 3d., and £228 1s. 2d. was expected to rank for dividend. The assets amounted to £10, the preferential claims

to 8s. 1d., and the deficiency was £218 9s. 3d. Debtor said he had lived at Bowness since Whiteside. Formerly his wife kept a lodging-house at St. Bees, and for about nine years he was surveyor for the rural sanitary authority at Whitehaven. In 1890 he lost that appointment, the salary being reduced to £70 or £80. He did not see his way to accept that amount, and did not seek the renewal of his appointment, which was a yearly one. He had been appointed under the urban district council at Bowness, but had only earned about £5 since September. He had nine children. His wife had to leave the boarding-house at St. Bees, and eventually they came to Bank House, Bowness. They had, however, to sell their furniture there through a distress and execution. The debtor passed his examination.

**TEMPORARY SEATING AND THE LONDON BUILDING ACT.**—**VENNER (APPELLANT) v. M'DONELL (RESPONDENT).**—In the Queen's Bench Division, on Friday, Mr. Justice Wills and Mr. Justice Wright heard this case. The information charged that the appellant, who is the secretary of the Royal Agricultural Hall, Islington, did at the hall, without notice to the district surveyor, begin to execute a work respecting which the appellant ought to serve a building notice before commencing it, contrary to the provisions of the London Building Act, 1894. By section 200, subsection 11 (b), any person who, being a responsible person who ought to serve a building notice, begins to execute a work respecting which he ought to serve a building notice before serving such notice shall be liable to a penalty. By section 145, where a building or structure or work is about to be begun, then two clear days before it is begun the builder or person causing the work to be done shall serve a building notice on the district surveyor. The Agricultural Hall is a large building constructed for the purpose of shows and exhibitions of various kinds. It is surrounded on the inside by galleries or staircases, which are permanent. Some of the exhibitions require that the galleries should be occupied by sittings for the spectators. Others require that there should be no seats, or seats only in portions of the gallery. Upon the present occasion the seats, which had been removed for the purposes of an exhibition, were re-erected without notice to the district surveyor, and it was in respect of the replacing of these seats that the information was laid. The iron columns which permanently support the roof and galleries have sockets attached to them, and the temporary and movable timbers to which the seats are for the time being screwed or bolted on are dropped or let into these. The magistrate convicted the appellant. Mr. Justice Wills, in giving judgment, said that it was obvious some limitation must be put upon the natural meaning of "structure or work," otherwise no person could repair his roof or windows or put up a fixed cupboard in his bedroom, or a new kitchen range, without giving notice to the district surveyor and without being (section 138) subject to his supervision, nor without, in the case of even the most trivial matters, paying him half the fee to which he would have been entitled on the original construction of the house or building (Schedule III., Part I.). It was impossible to suppose that interference so constant, vexatious, useless, and costly with the daily life of a great community could have been intended. It was therefore necessary to construe "structure or work" as meaning, in section 145, something of the same general nature and character as a building. The Act of 1894 was not retrospective, and this was not work done to or on the building. Neither sections 78, 82, nor 83 applied to such an operation as replacing these seats. The operation in question was not "the beginning of a structure" within section 145, and the appeal must be allowed. Mr. Justice Wright concurred. Appeal allowed.

Alterations are being made to the parish hall, Wirksworth, embracing the ventilation, which will now be carried out on the Boyle system.

The Sowerby District Council have appointed Mr. S. Utley, C.E., of Halifax, to continue and complete the proposed sewerage scheme.

New offices have been built in Pilgrim-street, Newcastle-on-Tyne, for the water company, from designs by Messrs. Freeman and Robins, of Morley-street, Newcastle. They are Italian Renaissance in style. Mr. John Ferguson, of St. Mary's-place, in the same city, was the general contractor.

New board schools have just been completed at Skirbeck, near Boston, Lincolnshire. Mr. R. Bicknell was the architect, and Mr. S. Sherwin the builder.

John Worster Beck, for many years secretary of the Grosvenor and New Galleries, died at his residence, Michwood, Merton Park, on Sunday, aged 62 years.

Mr. Donald Cameron, of Lochiel, performed the ceremony of formally opening a new post-office at Fort-William on Friday. The new building is situated in High-street, near the middle of the town.



## Our Office Table.

THERE is little the German Kaiser cannot do. He can command armies and navies with equal facility; he can preach, conduct a band, write music and poetry, design political cartoons, and lecture on scientific subjects. But he has now broken out in a fresh place—as an architect. A *Daily Graphic* correspondent tells us that he has altered and amended very considerably the plans for a Protestant church at Jerusalem which were submitted to him for approval. And he has designed and drawn, all out of his own Imperial head, a new tower. This addition will cost a matter of £16,000 extra, but that is a trifle when Imperial architects take up the T-square. If His Imperial Majesty ever takes refuge here, the obvious berth for him is the headship of the Science and Art Department at South Kensington!

The first of a series of four Cantor lectures on "Material and Design in Pottery" was given at the Society of Arts on Monday evening by Mr. William Burton, F.C.S. The author confined his attention in this preliminary address to simple earthenware, and showed by specimens and examples that plasticity is the most characteristic property of clay. Having traced the influence of this quality of plasticity on the shapes of pottery vessels, Mr. Burton pointed out how it had affected the methods of manufacture, by shaping, throwing, and pressing, and the methods of decoration, by modelling, carving, incising, inlaying, and painting. The use of natural clays was, he demonstrated, entirely confined to simplest kinds of pottery. Having touched on the primitive pottery of all periods, he successively described the so-called Samian ware of the Romans, Mediæval sgraffito, inlaying, as in encaustic tiles and Early slip-decorated wares, he then proceeded to deal with the introduction of glazes and the addition of other mineral substances to the natural clays, showing the modifications produced in the clay by such additions, both before and after firing, leading to alterations in the processes of making and of decorating. In conclusion, the lecturer referred to the evolution of fine earthenwares, stonewares, and porcelains.

ANOTHER competition scandal is reported from America. According to the *Engineering Record*, the recent competition for the design of the Passaic County Court House, at Paterson, N.J., has resulted in dissatisfaction to many competitors. It was announced that Professor W. R. Ware, of Columbia University, would be the professional adviser, and upon this understanding many men of position submitted designs. The award of Professor Ware was made in due course, and he picked out twelve of them and sent them to the Commissioners. These included designs by well-known architects. The Commissioners were not satisfied, and asked the referee to send all the other designs to them, and they then decided to select six of the remaining plans, chiefly by local men, as none of the selected met the ideas of the Commission in its arrangement. Thereupon, very naturally, the authors whose designs had first been selected were very indignant, and regarded the invitation and mention of Professor Ware's name as "calculated treachery" and a distinct device to obtain an open competition. Legal redress is contemplated. An old tale repeated. Local men were in the minds of the Commission.

MESSRS. WRIGHT SUTCLIFFE AND SON, of Halifax, draw attention to their new "Metropol" wash-down closet, the speciality of which is that the basin can be removed from the lead pedestal and trap, so that the plumber has full play to make a plumbing or wiped joint instead of being obliged to solder a piece of lead pipe to the earthenware trap. We may also direct notice to the same firm's novel departure in combination sinks. The drainer is not made of the same material as the other parts, as heretofore, but is constructed by means of a strong corrugated piece of indiarubber (specially moulded for this purpose) being firmly attached to the sink. By this arrangement, owing to the non-slipping and pliable properties of the drainer, a great saving in the breakage of, and damage to, crockery, glass, &c., is effected—an advantage which will be greatly appreciated by heads of families, hotel proprietors, restaurateurs, caterers, those in charge of public institutions, and others. Made in best fire-clay, splendidly enamelled, it

cannot get out of order, and is unsurpassed for durability and cleanliness.

AN abstract of the accounts and statements of building societies for the year 1895 has been issued by the Chief Registrar of Friendly Societies as a Blue-book. This shows that the total number of societies was 3,730, and of these 2,625 furnished returns. The number of members was 637,635, and the amount of the receipts £29,853,449. The liabilities of the societies to the holders of shares was £35,165,641 and to the depositors and other creditors was £17,718,606, while the undivided profit amounted to £3,074,881. The assets, on the other hand, included £43,866,031, being the balance due on mortgage securities (without prospective interest), and £11,693,155, the amount invested in other securities and cash. The deficit upon the total amount was, therefore, £399,942.

### CHIPS.

Lord Penrhyn's quarries were again opened on Monday and Tuesday to receive men willing to work, but none presented themselves.

From Lady Day next, Mr. Charles Barry's offices will be Parliament Mansions, Victoria-street, Westminster, instead of 1, Westminster Chambers, Victoria-street, Westminster. Mr. Barry has taken into partnership his eldest son, Mr. Charles Edward Barry, the title of the new firm being Messrs. Charles Barry and Son.

Mr. W. T. Woodroffe, of Beccles, has been elected borough surveyor to the town council of that town. Although the salary offered was only £100 a year, there were 53 candidates for the post.

The proposed expenditure of Ayr Town Council for 1897 embraces £10,000 on sewerage, £6,000 on iron bridge near station, £8,000 on extension of the waterworks, £1,000 on underground conveniences, and £10,000 on extension of electric-lighting plant.

Barry is going ahead, and a contract has now been signed for the construction of a new dry dock for the Barry Graving Dock Company at a cost of about £20,000. When completed it is said that the new dock will be able to accommodate the largest ship afloat.

A syndicate, of which Sir Francis Evans, M.P., and Sir J. Blundell Maple, M.P., are members, has undertaken the erection of a great hotel in the finest part of the Champs Elysées, in Paris. The site has been secured, and it is anticipated that the hotel—which is to be called the Elysée Palace Hotel—will be completed in less than two years. The hotel is to accommodate 450 visitors, and if the scheme is successfully floated the architect will be M. George Chevanne, of Paris, with Col. R. W. Edis, F.S.A., as English consulting architect, a fixed sum being arranged for their services. Messrs. Maple and Co. will furnish and decorate the building.

The Essex County Council have agreed, by a majority of 60 to four, to apply for permission to advance capital to the extent of £6,000 for the purpose of assisting the construction of a proposed light railway from Elsenham on the Great Eastern system to Thaxted and Bradfield.

Tenders for the demolition of the Palace of Industry at Paris are to be sent in on Thursday next, the 28th inst., and the work will be commenced at once, part of the building, however, remaining till after the Salon.

Mr. W. H. Vaudey has been appointed chairman of the Improvement and Buildings Committee of the Manchester City Council in the room of the late Mr. Alderman Clay, builder and contractor.

In the case of Martin William Brown Ffolkes, described in the receiving order as Martin W. B. Ffolkes, Queen Anne's-gate, Westminster, and St. George's-square, Pimlico, S.W., civil engineer, the discharge from bankruptcy has been suspended for three years, ending Dec. 17, 1899. In those of Charles Payne, George Payne, and Arthur Payne (carrying on business as C. Payne and Sons), Barrington-road, Crouch-end, N., builders, co-partners, the discharge has been suspended for two years, ending Dec. 18, 1898.

A Local Government inspector held an inquiry at Burnley, on Friday, with regard to an application by the corporation to expend an additional sum of £100,000 on public works. About one-fifth of the sum is to be devoted to the purchase of Townley Hall and 62 acres of land.

Kilmarnock Town Council have received a statement of claims from the contractor for the new reservoir, exclusive of others not yet priced, amounting in all to about £16,600, as against about £11,000 allowed by the engineer's measurements. The contractor expressed his willingness to submit the claims, with certain exceptions, to the arbitration of Mr. Gale, of Glasgow. The council agreed to discuss the matter in committee at a special meeting.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts. "Material and Design in Pottery," Cantor Lecture No. 2, by William Burton, F.C.S. 8 p.m.  
Surveyors' Institution. Discussion on "The Future Development of the Surveyors' Institution." Savoy-street, W.C. 8 p.m.

TUESDAY.—Society of Arts. "The Artistic Treatment of Heraldry," by W. H. St. John Hope, M.A. 8 p.m.

Institution of Civil Engineers. "The Division of the Periyar," by Col. J. Pennycuik, C.S.I. 8 p.m.

Auctioneer's Institute. "The Practice of Compensations," by Prof. Banister Fletcher, J.P., F.R.I.B.A. 57, Chancery-lane, W.C. 8 p.m.

Northern Architectural Association. Students' Annual Social Gathering. Assembly Rooms, Barras-bridge, Newcastle. 8 p.m.

WEDNESDAY.—Society of Arts. "Voice Production," by William Nicholl. 8 p.m.

Edinburgh Architectural Society. "Heraldry," by Ramsay Traquair. Donell's Rooms, Edinburgh. 8 p.m.

THURSDAY.—Society of Arts. "The Moral Advance of the Peoples of India during the Reign of Queen Victoria," by William Lee-Warner, C.S.I. Imperial Institute. 4.30 p.m.

The Society of Architects. "Restoration," by Thackeray Turner, Secretary of the Society for Protection of Ancient Buildings. St. James's Hall, Piccadilly. 8 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE THIRD ORDINARY MEETING of the Society of Architects for the Session 1896-97, will be held at the Rooms of the Society at St. James's Hall, Piccadilly, W., on THURSDAY, JANUARY 22nd, 1897, at Eight o'clock p.m., when a Paper will be read by Mr. THACKERAY TURNER, entitled "RESTORATION."

ELLIS MARSHALL, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.

The plans submitted by Messrs. John Symons and Son, of Blackwater, for the Passmore Edwards Technical Schools to be built at Helston, West Cornwall, have been approved by the town council of that borough, and the builders will, it is expected, commence operations immediately.

Mr. J. M. Gale, Glasgow corporation water engineer, reported to the water committee last week to the effect that the new reservoir at Craigmaddie had now been brought into actual use, and that water was being supplied from it direct to a part of the city through one of the new mains. The total storage capacity of the new reservoir and measuring pond together amounts to 717,000,000 gallons. The superficial area occupied by the water surface when the reservoir and measuring pond are full is 88 acres.

The estimate of Mr. J. L. Pearson, R.A., for the completion of the nave of the cathedral at Truro, with portions of the two western towers, is £40,500, and from the financial statistics furnished by the committee in a circular just issued, it appears that more than half of the amount—viz., £21,316—is already assured. This includes £13,500 which had been collected previous to the present movement; £6,868 promised or paid since the 2nd of October; and £948 sent to the London committee, with the special stipulation that it should be applied to Truro Cathedral.

The Mayor of Sheffield (the Duke of Norfolk) opened, on Friday, the new Court-house in that city. Some time ago the Corporation leased from the town trustees 670 yards of land at the rear of the old town hall, for 470 years, at a ground rent of £240 per annum. Upon that site has been erected, from plans by Messrs. Flockton, Gibbs, and Flockton, of Sheffield, an additional court, solicitors', waiting, and other rooms, and additional offices have been provided, and 22 extra cells for prisoners. There is easy communication between the old and the new courts. The cost of the additions has been about £18,000.

The memorandum prepared by the Labour Department of the Board of Trade on the state of the skilled labour market states that changes of wages during December were almost entirely in an upward direction. The percentage of unemployed, while somewhat higher for December than November, was lower than for any December since 1890. The percentage of unemployed at the end of December was 3.2, compared with 4.8 in December, 1895. The building trades (painters excepted) are still busy. The percentage of unemployed in unions making returns was 2.1, compared with 3.8 per cent. in December of last year. The furnishing trades are still fairly well employed for the season. The percentage of unemployed union members at the end of December was 4.3, compared with 4.6 in December, 1895.



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## BUSINESS RELATIONS.

THE old maxim, "Divide and Conquer," is one that seems hardly understood by those who bury themselves in details, when their proper duty is to arrange and control. What should we think of a general who took rifle in hand and lost himself in the ranks of his army? The business qualification of the architect is really, in short, his attention to the design as a whole, and the control of the building—not of course, we mean, to the neglect of details, but in so arranging them and dividing them that they shall not interfere with his general grasp of the work. Many of our best men are often too much absorbed in one branch of their art, that they are practically very bad at business, and allow the incompetent and superficially educated to obtain a mastery of their work. Why this should be so, more especially in the professions of architecture and engineering, is not easy to say, except that in both callings the technicalities and details make up so large a share of the duties of these vocations. But we think it is also because business capacity is not made a strong feature in the architect's training, like it is in others—the lawyer, the surveyor, and estate agent. It is a negligible quantity. Want of success is very much owing to this fact; and there is ample evidence to show that the business man, other things being equal, has a firmer hold of the situation, and is certainly more likely to win the favour of his employer, than the man who is master only of his profession. The fact is, the ordinary employer is superficial and financial in his taste, and the expert skill of his adviser in matters of detail is very little to his taste. Decision and firmness, persuasiveness of manner, and care for building accounts and contracts are more to his liking.

The architect and engineer have each to deal mainly with two classes of persons, with clients and committees, and with contractors, lawyers, and other agents. The relations of the architect to the first of these may be first considered. At the beginning we have the appointment and preliminary agreements, and here it will not be amiss to say that, as a rule, too much is left to after arrangements by the professional practitioner. Possibly he is afraid to say too much before fairly started upon the work. His expectations as to remuneration, the percentage, to be charged if the work should be abandoned or other contingencies happening; his claims as to the retention of his design and drawings are questions he does not like to moot just yet. "Let me get on with the work first," is the usual thought, not considering that the present is the opportunity, and that all subsequent steps only confirm by implication the views of the client, and render it harder to make the claim afterwards. Even here the business man can do something to give binding force to the engagement, by writing letters asking definite questions, and by introducing in them, though not too pointedly, conditions and terms, or by giving information about the usual ways of proceeding, these letters, if not negatived, being held as implied terms. By this kind of informal procedure it may be possible to "hedge round" a capricious or troublesome client, and prevent him from breaking away from his engagement. Tact only is required. As a rule, the average client is a "man of the world," "knows his way about," and as a capitalist probably, perhaps a director of companies, is a good

business man to boot. This fact ought to be remembered, as often the keenest business tact may be contravened on the "diamond cut diamond" principle. If such a client suspects that he is "being had," or that he is being trapped or bound, he is more likely to kick. At the same time, we are sure that a business client likes to deal with men of the same kind; there is a straightforwardness and directness about business qualifications which are appreciated by every man of the same calibre. Anything shifty or muddling is annoying to a client who has been trained to habits of precision and method. Amongst many architects there is certainly a lack of attention to this attitude of business. Business is regarded too much as a kind of commercial prowess, a desire to make money at all costs, and is thence mistaken as a sign of narrowness in a client. But really it is not so, if properly apprehended; it is, rather, a method of doing things which is repugnant to some men who have no principle or backbone of their own, or are too infatuated with their own attainments. And it is this better sense of business qualification which the profession would do well to cultivate if they wish to make their profession a success.

The reader will pardon this digression, but from what we have seen there are two sorts of business tact, the fussy and evasive and the honest. Amongst the questions which arise with the client is that about quantities. Now, a man who never says to his client that it is necessary that quantities should be prepared and a surveyor be employed to undertake the work, nor settles the remuneration for the same, is not acting quite fair and square. If cost is a necessary factor, and it generally is, we fail to see why there should be any hesitation in adopting the only basis by which an honest estimate can be made. A business client will certainly not undervalue it, when he is informed that few responsible builders will undertake to submit tenders without quantities. If the client is approached in this way, by explaining to him the object of this document, and that it precludes all guesswork on the part of those who tender, half the difficulties and misunderstandings might be obviated. Instead of which, the architect often employs the quantity surveyor unknown to his client, the commission being added to the tender. It may afterwards leak out, should the contractor discover any deficiency. Whichever plan be adopted, whether the quantities be made the basis of the contract, and the builder is only bound to execute what is therein allowed; or an independent surveyor is engaged to supply all parties tendering, taking the risks of error, the architect is on safer ground if he acquaints his employer with this requirement. If he does not, should the work be abandoned after the tenders are sent in, there may be, and often is, the question, Who is to pay the surveyor? Without an express or implied authority from the client to employ a quantity surveyor, he is placed in an awkward dilemma.

Take another instance where the business relations of the architect are often unpleasantly strained—we mean in the giving of certificates, or orders for "extra" work. Here, again, reticence or want of plain speaking may lead to disagreement. How often a contract is drawn up without explaining its conditions to the client. He should be plainly told what his liabilities are in regard to these matters of payment and extras. Regarding them as irksome, the architect is sometimes afraid to trouble his client with these details. The contract is looked upon as a mere form drawn up by a solicitor to bind the contractor, as if it did not cut both ways. These are points which many clients think most important, as they touch their pockets and the cost of the work; but the professional man who is not a business man imagines his employer does not want to be

troubled about them. Consequently, he knows nothing of his liabilities till the architect tells him such and such is an "extra," and has to be paid for, or till he receives the certificate authorising payment to the contractor. In nine cases out of ten the employer knows nothing of these matters. Were he plainly told that if he makes an alteration to the plan it will involve an extra that must be paid for, the architect would be in a far better position than if he had said nothing about it. Then the legal effect of an architect's certificate ought to be explained. Sometimes the employer will interfere: he requests the architect to withhold the certificate for some reason—perhaps convenience—and if he consents to this intervention, should an action be brought by the builder for payment, the client would be the loser. Would it not be well also if the binding effect of the final certificate on the employer was explained by the architect? Many an employer has refused to pay the amount his architect has certified for, under the mistaken notion that he had no right to do so because he thought the contractor had not carried out the work properly, or his architect had neglected his duty. When the case has been tried, the employer has done so to his cost. So with other matters; a proper business habit would save clients from a great many pitfalls and disappointments. A man may be learned in the law of contracts and the duties of clients and contractors, but at the same time be unable to cope with difficulties as they arise, and neglect to instruct his employer and the contractor in their respective duties and liabilities. Business qualification seems to be the one necessary link between professional competence and successful practice. Yet it is so often wanting and cannot be acquired by reading or study. It is a training only learned in the office and the routine of official life among employers and contractors.

The relations of the architect to lawyers, agents, tradesmen, cannot successfully be maintained by knowledge only. In dealing with solicitors and other business agents on questions of law, easements, liabilities, or in respect to valuations, business habits count for a great deal. Mr. Brown, who has jumped into the profession, originally a builder or surveyor's clerk, manages by tact and persuasion to settle a question of valuation, which his colleague, the holder of a diploma, has failed to do. Mr. Brown's knowledge of law is by no means great, but he has something else which cannot be learned—method and address.

On this subject the remarks of an American engineer (Mr. W. F. Goodhue) in an address before the students of the Purdue University appear to the point. He compares the lawyer's business qualifications with those of the engineer, and shows that although he knows nothing of engineering except in a general way, he generally manages to retain a tenacious hold on great works like railways after the engineer has finished his labours. The "weak and ephemeral grasp" with which the latter holds his position on any great undertaking is attributed to the fact that though he works "harder both mentally and physically" he has less business grasp of the situation than the lawyer, who soon becomes rich and influential, and represents "the power and standing of the concern." Examining the reason why this should be so, the author of the paper observes truly that the lawyer is better trained *outside* of his profession than the engineer, and therefore it is that he says "so many of our largest manufactories, railways, &c., are to-day controlled by men who are educated lawyers, and who know absolutely nothing of the details and manipulations of the business they control." The reasons why the engineer has failed to hold his own in the business world are because "he is too often the slave of details," he fails



to understand and manage men, and is deficient in business training and accounts. To this impeachment both the engineer and architect must plead guilty. Both are too generally absorbed in the details of technical matters to have any thought beyond. The advice given—sound as far as it goes—is to divide the care of details, leave all matters that can be depended on to take care of themselves to those who are engaged as clerks of works and other subordinates, and so obtain more time to devote to the general management of the whole business. Our most successful architects are either those who have acquired an eminence in their profession, and who are therefore able to devote themselves exclusively to the general design and supervision of their work, or those who, without such acquirements, have confined their attention to the outside duties of their business, and left to others the care of the details. There are many men, both engineers and architects, here and in America, who have pursued this course. The routine and lesser details they intrust to others. They receive periodical reports and balance-sheets of the works they have in progress. All plans and contracts are submitted to them to be examined, and then returned for execution. By this procedure they relieve themselves of burdensome details, and each agent is responsible for his particular work. In large and plain-sailing contracts this course can be adopted, but in architectural works of a special kind the success would entirely depend on the skill of those delegated with such authority.

#### THE STUDENT AND DECORATIVE CRAFTSMAN.

THE architectural student ought to be flattered at the amount of attention that has been given to his educational facilities and practical attainments. The President of the Institute has again been hammering with his accustomed zeal on the importance to the student of diligence and private study. A great deal that he said must be taken for granted. Reading between the lines, it would appear that he unconsciously threw a doubt on the value of much of the labour that can be expended on an examination for students. Professor Aitchison, for instance, dwelt on the importance of the "recognition by students and their teachers that architecture is a structural art," and that until this is realised no great improvement is likely to take place. The student cannot learn everything, and the sooner he comes to understand this fact the better it will be, and the less time he will be likely to waste in the effort. They cannot all be Lord Bacons, as the students were told; but had that philosopher lived in these days, he would have found his advice about mastering all human knowledge quite impracticable. In Bacon's time, science—except, perhaps, mathematics—meant a few laws and much desultory experiment; now, any one science is the study of a lifetime. The president's remarks, in short, went to show that the student cannot even become a proficient in the laws of the strength of materials and flexure without being acquainted with the differential calculus and other branches of mathematics which would take a lifetime to learn thoroughly. Another thing to remember is that we are not all born with equal capacities, or with genius for art; therefore, however much some students may "peg away" at the artistic elements of the profession copying examples of Classic and Mediæval buildings, they will make comparatively small progress compared with others in whom the gift of art instinct is inherited. How many, for instance, bother their heads over Greek proportions, mouldings, and copies of the antique, who, when they come to design an ordinary house,

feel that all their studies in those directions are thrown away and inapplicable! They cannot adapt what they have thus learned by rote, showing that their studies have failed to implant within them the power of perceiving or of giving artistic expression to their work, however simple it may be. It is very true indeed that we, as a nation, have lost all desire for art as the embodiment of the ideas of the age. How little our workshops, schools, baths, workhouses, and unions show the impress of art! It is, in fact, entirely absent from them, as if it had nothing to do with these common buildings of everyday use. But this utter want of perception of art, or what it really is, is quite in keeping with the regard for mere antiquarianism, which in the minds of many has taken the place of architecture.

These reflections lead us to consider our use of those decorative handicrafts which form a part of our every-day buildings. Mr. E. Prioleau Warren's remarks on "Decorative Plaster-work" at the Architectural Association are not without instruction. As the author of the paper said, the temptation to execute bad plaster decoration is its "immunity from the natural and powerful restraints that cost and structural necessities impose on most other materials." The plaster-worker, unless he imposes restraints upon himself, is sure to go wrong. We need only look at the exuberant cornices and prodigiously "confectioned" centre flowers described by the author that did duty not so many years ago in most of our modern residences. These atrocities vulgarised plasterwork so much that we were pleased to see plaster decoration superseded by other crafts, even the imitation oak-panelled ceiling. The "centre flower period" has happily disappeared, except, perhaps, in its continuation among the "jerry" builders. The 17th-century revivals of the Elizabethan and Jacobean, or even Italian and French, ceiling decoration, have, too, been overdone. These "revived" decorations still do duty in suburban villas; strapwork, armorial bearings, and devices, all kinds of panelled work, travesties of the ceilings of Knowle, Chastleton, Bramshill, and other halls of those periods. All that is really good and artistic in the old work is absent—namely, the charm and interest of handiwork and time. There was neither mechanical exactness nor repeats; the surface was slightly uneven: every mitre and intersection was done by the hand of the artist, and the plaster itself was coarse, mixed with coarse sand or fine gravel.

Mr. Warren gave some suggestions that may be followed with advantage. The value of the plain surface is one: and he referred to a few good modern examples of this in the late Art and Crafts Exhibition. Unevenness of surface and rough texture are other qualities that may be studied with much effect, instead of that evenly-floated ground, mechanical uniformity, and rigidity which the ordinary plaster-worker delights in. The modern plasterer is the slave of the drawing and his tools, and modelling with him is at a discount. Speaking of the design of ceilings, Mr. Warren showed that delicate relief will be more telling in a well-lighted room, with the tops of the windows reaching nearly to the ceiling. On the other hand, if the windows are low or small, the relief should be of bolder character. "A room lit from opposite sides, giving a strong cross-light, is the most difficult to treat successfully," and in such a room, the author says, greater emphasis and sharpness of modelling is necessary. Rather broad and shallow ribs are recommended in an averagely-lighted room of 13ft. in height. Sharpness and hardness are best avoided by having the ribs and cornices modelled, not run, and the ribs should be simple and broad, not liney or wiry. A geometric basis is considered desirable for the main lines. These are sound rules, and we also think for large rooms the plan of separating

the decoration of the ceiling from the cornice by a plain margin between them, so that the cornice may be regarded as the crown of the wall is right. The decorative ceiling is by this means made a distinct part. The increasing use of fibrous plaster slabs for ceilings shows that architects begin to appreciate this mode of interior decoration. Even for church roofs plaster-work has of late years begun to re-assume its position. We do not say that it is so appropriate as timber or deal when that material is rightly employed; but it is better than a great many of the stained deal roofs we see. When the roof is modelled by a real artist in plaster like Mr. G. Frampton, the effect is all that can be desired, and by the use of colour and gilding the plaster ceiling can be rendered more decorative than the wooden roof. The remarks of the author of this paper on the treatment of fibrous plaster in church roofs are worth attention, especially in regard to oil colouring or distemper. Fibrous plaster slabs can be put up *in situ* upon any curved roof, each panel being a slab, and the edges disguised by wooden ribs. They can be modelled to any curvature by the modeller's own hand, though not always *in situ*. In modern interiors a great deal is left to the plasterer, too little to the modeller. The designs and cast work are all done in the workshop and fixed on the actual ceiling without any previous study, instead of a model being prepared of the roof on which the modeller could make a study of his design. Of course, the modelling of the plaster-work of a building ought to be a special contract, quite independent of the general contractor's work. We can look for no great improvement in plaster-work or any of the special crafts until these branches are left to the architect to make his own appointments.

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—IX.

THE facts last instanced have a direct bearing on the processes of drilling and punching. Numerous experiments have demonstrated that the absolute strength of plates perforated by drilling or by punching and reamering is in excess of that of solid plates of the same net section. This effect cannot be due to the mere fact of drilling or reamering, but must be caused by the mere disparity of dimensions in adjacent sections, taken on the line of the drilled or punched holes, and in their immediate vicinity. This conclusion is also borne out by the fact that invariably the increase of strength is accompanied by diminution of ductility.

The manner in which the drilling and punching of holes affects the behaviour of a plate depends partly upon the relations of the diameter of the holes and their locations in the plate, partly on the hardness or ductility of the metal; even though equal net sections be left, a single hole always distresses a plate more than two holes of half the size. Mr. Adamson made several experiments on this matter. Test-pieces, Figs. 31-34, having the same area across the plain part as that left by the holes invariably fractured through the single hole, Fig. 32; never through the two holes, Figs. 33 and 34, but always through the plain section, as shown. This is, doubtless, an effect of the flow of ductile metals already referred to, the larger hole interfering more with the flow and tending to rupture, while the smaller holes interfere less with it, and therefore do not strain the material so greatly. It is, therefore, better to insert several small rivets in joints, suitably distributed, than to insert a few large ones; the harder the material also the greater is the need to observe this precaution, because hard metal has less ductility and power of accommodation to the stresses than soft material.

It was found that the insertion of a pin in the hole increased the carrying power considerably, increasing it by 5.25 per cent. over that of the plate in which the hole was unsupported, and leaving it only 3.1 per cent. less than that of an unperforated plate; this illustrates how necessary it is that rivets should quite fill up their holes. The views, Figs. 35, 36, illustrate by the difference in



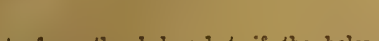
degree of the opening out of the line of fracture that the larger hole, Fig. 35, arrests the flow of metal to a greater extent than the two holes in Fig. 36.

Since the capacity of a material to flow under severe stress depends primarily on the degree of the ductility, the reason why drilling or reamer-ing is superior to punching is clear; the metal in the immediate vicinity of a punched hole becomes hard, compressed, and brittle. The hardening does not extend far, not more than about  $\frac{1}{16}$  in. inwards, in an annulus around the hole, and the thicker the plate the more injurious is the effect. If the plates are drifted and riveted while in this condition cracks are very likely to

FIG. 31.



FIG. 32.



radiate from the holes; but if the holes are reamed out to the extent of about  $\frac{1}{16}$  in. the hardened non-ductile annulus is thereby removed, and then the plate is as ductile in the vicinity of the hole as elsewhere, being left in a similar condition to drilled plates. If the hole in the bolster or die-block is but little larger than the punch, the effect is more injurious than when it is  $\frac{1}{16}$  in. or  $\frac{1}{8}$  in. larger. The reason why punching should have such an effect is clearly similar to that which occurs in consequence of cold rolling, hammering, bending, and drawing out. The difference is greatest in the thinnest, least in the thickest plates; hence, the lighter the sections used in a structure the more need is there that holes should not be punched, but drilled. In small narrow bars, punching means risk of deformation, and also of inaccuracy in regard to centres, which may mean a serious diminution of strength.

Similar effects follow during other operations carried on by platers, and these have a most important bearing on the strength of structures, and are the subject of rigid specifications. Shearing, like punching, acts in much the same way as hammer blows, or cold rolling, inasmuch as it hardens the material in the immediate locality, and produces the same injurious effects of increased tensile strength and much diminished ductility; hence, the reason why specifications are very stringent as to annealing, reaming out, or drilling and planing shorn edges, all of which devices restore the original strength and ductility

FIG. 33.

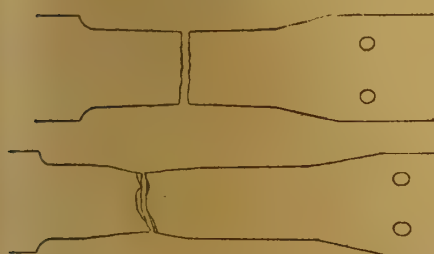


FIG. 34.

of the material. It is the custom in the shops to take shearings from the edges of the plates and test them roughly by bending for strength and ductility. If a test-piece only roughly shorn off is bent it will crack and break much more readily than a similar piece which has had the roughness of the shorn edges removed by planing; if plates are worked up with edges shorn only and not planed they are more liable to crack when being straightened, drifted, riveted, and caulked than similar plates whose edges have been planed. In all good work, therefore, the edges of the plates are always planed.

When hammering, cold rolling, bending, flanging, or unequal heating is done on plates or

sections the effect is similar; the material becomes non-homogeneous, partly ductile, partly brittle in adjacent sections. Nothing is more unsafe than this condition. If the plate or section is then annealed the effect is similar to reamer-ing or planing, the hardened and compressed material becoming softened by the restoration of the crystals to their original state. So important is the influence of these matters on the elastic strength of structures that inspectors cannot insist too strongly on the observance of the terms of their specifications relating thereto; in fact, many engineers will not allow holes to be punched at all, but insist upon drilling in all cases—a not unnecessary precaution; since, in practice, many holes which are punched overlap at the edges, and, when reamer-ing is done, it must then often happen that the metal will be removed chiefly or entirely from one side of a hole, leaving the hard metal on the other side untouched. From this objection drilling is, of course, free. The effects of annealing on steel plates are seen by the following table:—

TABLE V.

Plates.	Tenacity in tons per square inch.	Elongation in 8 in. per cent.
$\frac{1}{16}$ in. plate, mild steel, unannealed	26.60	24.32
ditto ditto annealed	24.05	29.87
$\frac{1}{8}$ in. ditto ditto unannealed	28.55	25.05
ditto ditto annealed	26.95	26.90
$\frac{1}{4}$ in. plate, hard steel, unannealed	32.97	16.65
ditto ditto annealed	28.52	24.12

Mr. Webb found that while annealed sheet plates bent cold had a tenacity of 32.42 tons per

FIG. 35.

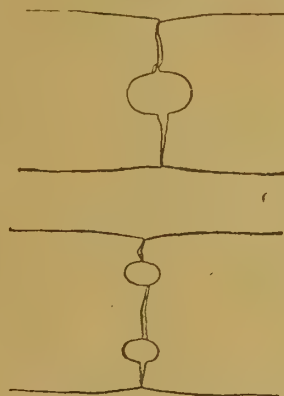


FIG. 36.

square inch, and an elongation of 12.5 per cent. in 10 in., the same plates annealed after bending had a tenacity of 30.60 tons and an elongation of 23.63 per cent.

Fig. 37 illustrates the difference in the curves of a hardened bar, *a*, and of the same bar annealed, *b*. The first behaves like a spring, has higher tensile strength but less elongation than the second.

The exact tests already illustrated are most important, revealing facts which could not otherwise be learned, and if steel is purchased of a firm of eminence it can generally be relied upon without incurring much expense in subsequent testing. The large steel works maintain a constant check on the quality of their products by unremitting testing; the machine and laboratory are always occupied, and the forge tests are also employed. A shearing is taken from every plate, or from a plate of every heat, and test for temper, and preserved for possible future reference.

The forge tests enable the engineer and contractor to exercise a constant check of a rough and ready but reliable kind on the consignments of steel which he receives. A practised eye can estimate the quality of steel by means of these, which cost little by comparison with the cost of testing prepared specimens. There are few plates or angles from which some material has not to be removed during the course of manufacture, and these shearings or sawn-off portions can be subjected to rough and ready tests, which are as surely indicative of the toughness and strength of a given plate or section as a prepared piece would be. It is easy to see by the behaviour of such pieces during bending, drifting, &c., how the material will be likely to behave when sub-

jected to stress and strain in a structure; these are being constantly made in the shops and yards of the manufacturers, as well as by the accredited inspectors of great public bodies. Thus, ductility is evidenced in other ways, besides a percentage elongation of the length, and the reduction of area which takes place. When a bar or strip is bent the radius to which any given thickness can be bent is a measure of ductility; when a hole is punched, and the metal drifted, the size to which it can be drifted without fracture indicates ductility.

The following are some of the commonest forge

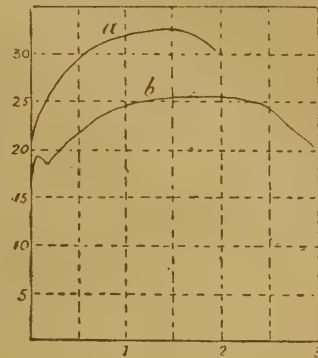


FIG. 37.

tests, both hot and cold, the difference between the two consisting chiefly in the amount of extension which the specimen will take before fracture. It is well to note that there is scarcely any limit to the number and variety of tests of these kinds, though they follow a few well-defined courses. Thus simple bending of a cold specimen is an excellent indication of the degree of ductility present. A good specimen of steel, from  $\frac{1}{16}$  in. thick, can often be bent double over on itself cold without fracture occurring, and a specimen that would not bend over a bar of a radius equal to  $1\frac{1}{2}$  times the thickness of the specimen without fracture would usually be rejected; no iron, except Yorkshire, would stand such severe treatment. These bending tests when applied to bars and rivets give similar results, good steel often bending quite double cold without fracture, while it is expected to bend round a curve equal to the diameter of the bar or rivet. In angles, tees, channels, &c., the flanges must also stand doubling up or unbending until they lie in one plane; or, the flanges remaining in a normal condition, the section will be bent round bodily to a small radius, the diameter of which will depend on the depth of flange; frequently a nick is cut across the specimen before bending. This is done in order to produce a fracture right across in the act of bending, and it indicates the quality of the grain—whether fibrous or crystalline, or whether compounded of both conditions, whether the fibre is clean or dirty, dull or bright, whether it fractures easily or with difficulty.

Then there is another class of forge tests—the drifting. These are very common, and afford a good measure of the ductility or extensibility of a specimen. A hole is drilled or punched, and a drift driven forcibly through until the original hole is increased to twice or thrice its original diameter. These drifting tests are generally made near the edges of plates or in the middle of a bar, and in each case the material will, if good, stand so much punishment that the bounding edges will be reduced to an extreme tenuity before fracture occurs. A very common test, hundreds of specimens of which I once saw in the testing-room of a great steel works, is the ram's horn test. This combines the drifting with bending. A bar is taken and punched, the hole is drifted out until it is larger than the diameter of the bar by one-third; then one end is slit down, and the two parts turned back until they come to the sides of the bar.

Experiments by Mr. D. Adamson on drifting tests gave the following results:—The tests were carried out on washers drilled with a hole to suit a particular size of rivet to suit the thickness of plate which corresponded with the thickness of the washer, and with an outside diameter equal to the lap of such a plate for a single riveted joint. It was found that the ordinary best iron plates showed an extension in the diameter of the hole by drifting from 27 per cent. up to 50 per cent.,



while the best high-class Yorkshire plates endured drifting up to 91.5 per cent. before twisting; that in mild steel plates the holes were enlarged from 133 per cent. to 187 per cent.

Another way of testing adopted in rivets is to hammer out the heads until they are three or four times their original diameter and correspondingly thinned; the amount of thinning out which they will stand without cracking of the edges is a measure of their ductility, and consequent capacity for riveting over.

A forge test used for mild steel is the temper test; it is one by which the presence and influence of hardening elements in the steel can be estimated. If a steel is too carbonaceous the temper test will show that in a very matter-of-fact way. A strip is heated to a cherry red, and plunged into water at a temperature of 82° Fahr.; that is precisely how carbon steel is hardened. After quenching the strip is bent round to a certain radius, according to thickness, usually 1½ times its own thickness. If there is too much carbon in the steel, bending will produce fracture; if bending takes place without fracture, the steel is so mild that it will not take a temper. It is assumed that any mild steel, whether required for structural purposes or for boilers, will stand the temper test. J. H.

### ADAPTABLE SPECIFICATIONS.— XXVIII.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued).

THE CARPENTER AND JOINER generally makes his appearance at the building before the walling and masonry are nearly completed, and his productions are amongst those which it is most difficult to keep up to the level provided for in the specification. When the contract calls on him to provide the "best" class of timber, he puts a highly conventional meaning on the word "best," and thinks he has done fairly well if he has supplied stuff of the second or third quality. This, in fact, is so commonly passed where superior kinds have been specified, that most contractors would think themselves extremely ill-used if they were bound down in this respect to the strict letter of their agreement. This, however, is a very unsatisfactory way of doing business. It would be far better for the architect to consider, in the first instance, what class of timber he really requires for the building then in question, to specify that class, and to insist on getting it. The very best stuff is not wanted everywhere. Quite inferior kinds are good enough for temporary sheds and coverings. Swedish timber of medium value may do for cheap cottages, "best middling" Memel and Dantziger timber is suitable for fair ordinary buildings, while "Crown Memel" timber may be reserved for really first-class carpentry. There is a great difference between the price of these things. When small Swedish balks are worth about 30s. per load of 50c.ft., larger Swedish timber costs about 50s., "best middling" Memel and Dantziger about 65s., and "Crown Memel" 75s. or more. It is not wonderful, therefore, that Swedish timber constantly tends to make its appearance in places from which the architect meant it to be rigidly excluded.

Swedish deals of the very best quality, especially from Gefle, have a good reputation, although Swedish timber has not. But only a very small percentage of Gefle deals are of this superior sort, and all Swedish deals, even the best, are liable to twist and get out of shape. For really high-class joiners' work there are no better deals than the best Archangel, shipped by a firm like Brandt's; the best Onega, as supplied by the Onega Wood Company; or the best St. Petersburg, as sent over, for instance, by Messrs. Gronoff. But the young architect must not suppose, because these qualities of deal are satisfactory, that large timbers of the same material would be equally good. The kind of wood which is admirably suited for joiners' work is often very unsuitable for structural purposes. Archangel deals, for instance, are very clean and free from knots and resin, and these properties make them useful for doors, framing, and mouldings. But they lessen their durability in exposed positions, and make timber of the same sort soft and weak when used for roofs or girders. Carpentry, if it is to be of the higher class, should always be worked from timber, and not from imported deals and planks, though this rule is more

honoured, perhaps, in the breach than in the observance. St. Petersburg deals are often full of shakes, being so cut that many of them contain the centre of the tree. Christiania deals were formerly in great demand, but the supply is now almost exhausted. Memel, Riga, and Dantziger deals are somewhat coarse-grained. White deal is unsuitable for any but the very commonest joiners' work, being full of hard knots and likely to warp. In the North of England, however, it is used as floor-boards, apparently from a belief that it contains no sapwood. The truth is, however, that in white deal the sapwood cannot be distinguished from the rest of the stuff by its colour, and so is supposed to be non-existent.

Quality-marks on timber are constantly changing, sometimes from quite honest and natural causes, and sometimes for reasons which come very near to fraud. To impose on those architects and builders who rely on the high-class brands, it is said that importers in this country are in the habit of ordering very inferior goods to be marked with these same brands before they are sent here from Baltic ports. Even without tricks like this, the various marks in use are so numerous, and often so illegible, that hardly anybody but a timber-merchant can be expected to recognise them. Moreover, apart from the deception of intentionally branding bad classes of stuff with the marks which were invented to distinguish the best, there is a great difference between the wood which different firms send out under the same denomination. The first quality of one firm may be no better than the second quality of another, and so the architect will ultimately have to approve or condemn the material, not according to the marks on it, but according to its actual goodness or badness. Another point to be particularly noted is, that what the Baltic shipper calls "second quality," the timber-merchant calls "first quality"; what the shipper calls "third quality," the timber-merchant calls "second quality," and so on. It may easily be imagined that amongst all this complication, confusion, and deception the contractor who means to evade his contract need never lack excuses for doing it. It is in his woodwork, therefore, that the bad builder shows his badness most conspicuously. Many a man may be trusted to execute plain brickwork who could not turn out the simplest class of carpentry or joinery without incurring perpetual rejection of his work, and starting perpetual disputes arising out of this rejection. The practical question is, then, "How can the architect best contrive to keep the woodwork up to the standard which the specification provides?"

It is an obvious answer to say: "Employ a good builder, and give him a fair price." There are few architects who, if they had their own way, would do anything else. But while the architect advises, the client decides. Perhaps he has a favourite contractor, who is to do the work. This happens sometimes, though not often; and the contractor may be a favourite for all sorts of reasons besides the excellence of his productions. But more frequently the building owner has set his heart on getting the lowest possible tender, no matter from whom. He has an architect, and whoever may be employed to build, he relies on this architect to get the building carried out according to the specification. In this case the architect will do well to let it be known before tenders come in, that a high standard will really be insisted on. Then, by way of making it possible to insist on it, he may do one of two things. He may exhibit samples—not little bits of stuff, but sufficiently large ones—of the quality of timber and deals which all persons tendering will have to supply. Or, on the other hand, he may cause the builder whose tender is lowest to submit samples to him before his tender is accepted, and if the samples are not satisfactory, he will have a good reason for advising his client to employ a better man, even at a higher cost. If the building owner chooses, in spite of his architect's advice, to accept inferior stuff, he will know what to expect as his building goes on, and the responsibility will rest with him, and not with his architect. The samples, in either case, should be those below the quality of which no stuff will be passed. If they are looked upon merely as an average, the contractor may subsequently send a small fraction that is better, and a great bulk that is worse; and then, again, there will be a boundless opening for disputes. Another safeguard which has been recommended is for the architect to reserve the power of inspecting the detailed invoices pertaining to the

timber which the contractor is using; but there would obviously be means of evading such an inspection as this.

In the great majority of cases, disputes about timber in this country are disputes about the quality of Baltic fir or yellow deal (called in the North of England "red deal"). This is the wood of the Scotch fir. When good, it is marked with a strong semi-transparent red grain. Fir of a pinkish, flesh-coloured or salmon-coloured tint is to be avoided, being always of inferior quality, and the more inferior it is, the more small knots and dead knots there will be in it. Good Baltic fir is heavy; bad Baltic fir is comparatively light, so that if both are equally dry, a piece of best Memel or Dantziger timber will weigh much more than the same bulk of Swedish. The best Baltic timber is clean and straight in the grain, not soft and shaky at the heart, nor possessing much sapwood, nor many or large knots. Dead knots in a log are frequently a sign of internal decay. The sapwood in Baltic fir, though it is light-coloured when quite fresh, soon turns bluish or greenish by exposure to air and damp, and generally shows itself plainly in those tints by the time it reaches England. The very worst qualities of Swedish timber may be found in cheap wood block flooring. In many cases one side of a narrow block will show the pith or centre of the heart, while the other side exhibits an inch or two of sapwood, and the stuff, where it is not blue, will be soft and pinkish. Swedish timber comes over in a tapering form, which is not the case with Memel and Dantziger, and these very objectionable blocks are cut from the upper ends of the trees.

When good timber has been procured—say, for an open roof of architectural character—the next thing is to prevent it from being spoilt before it is covered in. A careless builder will dawdle over his carpentry, will leave his roof timbers lying on the ground exposed to the weather for weeks before they are hoisted, and will not trouble himself though they are getting covered with dirt, bruises, and footmarks. Then he will put up his trusses at long intervals, and let them stand unprotected in the sun and wind till the timber has opened, and is full of cracks and shakes. Next, when the architect complains of its blackened and defective state, he will send up a man, not to plane, but only to wash the ingrained dirt off, the usual result being that he washes it in, and turns the bright-coloured timber to a dismal drab. Then he will send up another man with a load of putty to fill up the fissures, and finally he will advise the architect to have it all stained and varnished. Stain and varnish hide a multitude of sins, and even the worst carpenter can hardly do now all that he did in the dark age when these things were in fashion.

With pitch-pine there is less trouble as to quality than with Baltic timber. Bad sorts are not in the majority, and a great proportion of this wood has for years past been both cheap and good. Defects in pitch-pine work generally arise from shrinkage. This is not altogether the fault of the wood: it very often arises from the manner of using it. It can be obtained in large sizes, and, to save labour, it is frequently put in of widths from 15in. to 20in. where yellow deal would be worked in much narrower pieces, and framed or tongued together. Of course these very large pieces shrink in proportion to their size, and the material gets a bad name which it does not deserve. In joinery it should be prepared as long as possible before being put together, for, no matter how long it may have been in stock, it is sure to contract to some extent after being newly planed. Here and there it may contain knots from which turpentine exudes, and these, of course, should be excluded from the joiner's work. Where they are not so, it is generally because they occur in a board of excessive width, which would have had to be narrowed if they had been removed. Yellow pine presents to the joiner the same temptation as pitch-pine—that, namely, of using it in excessive widths. But it has neither the beauty nor the durability of the harder wood. A finger-nail will scratch it, and a blow with the knuckles will bruise it badly. It is as easy to work as pitch-pine is difficult, and the labour-saving contractor, therefore, often offers to substitute it for yellow deal "without extra charge." The architect, however, who wishes that his work shall keep in good condition, will be very shy of it, and will use it, if at all, where it is neither liable to exposure, nor to any but the very mildest of wear and tear.



## BEVERLY MINSTER.

Hammered Iron Screen  
in North Aisle of  
Choir.



Lewis E. G. Collins, A.R.I.B.A.  
from a drawing by Mr. Lewis E. G. Collins, A.R.I.B.A.

## WROUGHT-IRON GATES, BEVERLEY MINSTER.

THESE 18th century wrought-iron gates originally formed part of the choir screen which was taken down during the restoration of the building under Sir Gilbert Scott about 20 years ago in order to make way for the present screen. They were then placed in the position they now occupy across the north aisle of the choir. The initials "J. B." in the centre panels doubtless refer to John of Beverley, the founder of the monastery in the 7th century, who was subsequently canonised and adopted as the patron saint of the church. Our illustration is from a measured drawing by Mr. Lewis E. G. Collins, A.R.I.B.A.

## THE BUILDERS' MERCHANTS' ASSOCIATION OF LONDON.

THE third annual dinner, preceded by the annual general meeting, over which the president for 1896 (Mr. W. Sankey) presided, was held at the Midland Grand Hotel, St. Pancras, on Thursday the 21st January, 1897. At the dinner there were forty members and guests present, who enjoyed the excellent repast provided.

The proceedings following the dinner were opened by the President for 1897 (Mr. Clement Braby), who presided, proposing the health of the Queen and the Royal Family, which was well received and heartily responded to. Following that came the toast of the late president, Mr. W. Sankey, of Hammersmith, which was ably given by Mr. Erith, who commented upon the able manner in which the retiring president had carried out the arduous duties of that office. The late president replied to the toast, thanking those present for the hearty manner in which they had received it, and stated that in his endeavours to further the interest of the association he had received much benefit and pleasure.

The toast of "the President for 1897" (Mr. Clement Braby) was intrusted to the care of Mr. E. Montague Edwards, of Messrs. Young and Marten, Stratford, who remarked that an association of this character needed in its president an experienced, determined, and yet diplomatic individual, to insure its successful working. It had prospered under the presidency of Messrs. Hughes, Broad, and Sankey, and he felt in proposing the toast of the present chairman that

the association possessed in him the qualities necessary for such an important position. He would like to see the good points of the four presidents rolled into one, in order that the association might materially benefit by the combined wisdom, energy, and tact; but as this would be impossible, the next best course to pursue would be for the presidents to act conjointly as one.

Mr. Braby, in replying, said he appreciated the toast, and further said, the very fact of the Association existing, and of these annual dinners being held, giving the merchants an opportunity of meeting in good fellowship, had done, and is still doing, a great deal to further the interests of the trade generally. This Association had, during the past year, been working in a quiet way; but he felt sure that a very great deal more good work had been carried through than could be represented in black and white in the minute book.

The next toast was that of "the Builders' Merchants' Association and kindred Associations, coupled with the names of Messrs. Hughes and Wragge," proposed by Mr. Dobson (of Messrs. Godson and Dobson), who, in the course of a well delivered speech, said: "Since I have been in this building, and have had the pleasure of listening to your annual report, and to the remarks that have been made concerning the work of your Association during the past year, I am filled with wonder and astonishment that you could go on so long without someone thinking of starting the association years before you did. I believe you have done very good work indeed in the past; but I also believe there is far more to be done in the future, if only we can be brought together more often as we have opportunities, for being in an association like this, I feel sure the result will be most beneficial to all."

Mr. Wragge (of Messrs. Eastwood and Co.) rose amid cheers to reply on behalf of himself and the kindred associations, and said: "There may be many associations kindred to your association; but the two with which I am personally most concerned are the Brick Masters' Association and the newly-formed Lime Merchants' Association. With regard to the Brick Masters' Association, it is pursuing the even tenor of its way. I hear that several merchants belonging to your association are thinking of going into the brick trade; but I may tell them this—it is not such a flourishing business as it is made out to be. I can assure

those present that there is no antagonism between the brick masters and merchants. What the former have done they have had to do in self-defence, and I think it is for the merchants to support them in it. It has been said by one speaker to-night that he hoped I should one day preside over this association as I preside over the Lime Merchants' Association. I beg to say that that I do not preside over the Lime Merchants' Association, but am identified with it as its hon. secretary. I am entirely in sympathy with the Builders' Merchants' Association, and give it my support, because it has been the means of my becoming acquainted with many merchants whom I only knew before by reputation. I quite agree with Mr. Dobson that the more we are brought together, the better it will be for us. With reference to the Lime Merchants' Association, I think it will succeed, because it is now so strong that no lime merchant or burner can place himself against it. I thank you very much for the way in which my health was proposed, and to the utmost of my ability I will work with the Builders' Merchants' Association."

Mr. Hughes then rose to reply for the Builders' Merchants' Association, and in the course of some spirited remarks said: "With perseverance and pluck, I believe we shall prove a great success. I daresay some of us remember the Midland Pipe Manufacturers' Association—the pipe manufacturers are now united as a body, and I do not see why we cannot get into touch with them, and as they are now more consolidated, I think we are in a better position to approach them; all they ask for is a *quid pro quo*. It has been a great pleasure to me to have Mr. Wragge here, and to listen to his remarks this evening. We have heard his words, and I think they will have their effect upon all. If we only stick to our guns, by the end of this year I believe we shall be united in association for our mutual benefit, and I hope that when that does come our friend Mr. Wragge will 'boss'."

Following this toast was that of "The Visitors," proposed by Colonel Sankey, who is one of, if not, the oldest merchants in the lime trade in London. Colonel Sankey said, in proposing the toast, that he was certain the Builders' Merchants' Association would succeed if only there existed combination and honesty of purpose amongst the members.

Mr. Joseph Cooke (of Messrs. Freund and Co.)



suitably responded for the visitors, and at the same time announced his intention of joining so useful an Association. Music and songs were interspersed between the toasts. There were several visitors present, amongst whom was the solicitor of the Association (Mr. Percy Braby). The proceedings were brought to a close with the National Anthem.

### THE ARTISTIC TREATMENT OF HERALDRY.\*

By W. H. ST. JOHN HOPE, M.A.

THE question has, perhaps, often suggested itself to some of you. Why do the ancient applications of heraldry always look well, whilst the modern attempts to use it are invariably dull, lifeless, and uninteresting? The answer is much the same as the explanation of the difference in appearance between the old west front of the cathedral church of Peterborough and the new north front of Westminster Abbey. The one was the handiwork of masons who were themselves artists, while the other is the mechanical interpretation of an architect's drawings by mere human machines who work by rule. Ancient heraldic art was the product of men who thoroughly understood it and revelled in it. Modern heraldry is a lifeless thing, dependent on needless rules and restrictions, and derived from a succession of textbooks and manuals that might profitably be collected and burnt in one huge bonfire. I propose on the present occasion to deal with English heraldry only. Not that no other is worthy of consideration, but because there is not time except for the one, and that so fully illustrates the general principles of artistic heraldry followed in other countries, that it is unnecessary to go further afield. We will begin with a consideration of shields and their treatment. The shape of a shield is in itself entirely arbitrary and devoid of meaning, and varied from time to time simply from change of fashion, like the form of an arch or the design of a window. These changes must not, however, be overlooked, for the shape of a shield varies according to its date, and it would be absurd to use one of the ornate forms of the 15th or 16th century on which to paint, say, a 13th-century type, or to fill an early form of shield with charges that tell of a much later date. There will, however, be found from the 13th century downwards one simple form of shield, that known as the heater shape, from its likeness to the base of a flat iron, which, on account of its capability of displaying any one of the countless possible combinations of heraldic charges, has continued always in use. This may safely be adopted in general practice, and the elastic way in which its curves may be slightly altered when required specially commends it. From the form of the shield we may pass to the consideration of its surface or field, and the way in which this should be treated. In the simpler shapes the field, when painted, is invariably shown flat; but if carved a slight convexity, or even concavity, is often met with, the artistic advantages of which I need not dwell upon. Some of the ornate late forms, such as shields with incurved or engrailed edges, are often worked when carved into a series of ridges and furrows, and occasionally with good effect; but there is a tendency to carry this to excess, and so to injure the appearance of the charges. If the shield is well covered by the bearings on it, it is better to use a simple form than one with a ridged surface. A reference to a number of good ancient examples of heraldic shields will disclose the care that has been taken to cover or fill up the field, as far as possible, with whatever is placed upon it. A lion or an eagle, for instance, will have the limbs and extremities spread out, so as to fill every available corner; and the same will be found in every group or combination containing objects capable of arrangement or extension. Even with most unpromising combinations, or a group of charges that cannot be extended or altered in any way, or with a single ordinary, like a bend, pale, or chevron, the mediæval artist was still equal to the occasion, and by judicious adjustment of proportions, or some equally commonsense method, contrived to make his shield look well. Another important point will also be noticed in all ancient heraldry: that in shields containing a number of like objects, such as the three lions of the royal arms, no two are exactly alike, but each differs

slightly from another in pose or in size, according to its place in the shield. So, too, lines and curves are hardly ever quite true, but are drawn by hand, and not with pen or compasses. Herein lies one of the great differences between the ancient and the modern treatment of heraldry. The modern artist draws his lines and curves with mechanical precision; his charges are exact copies one of another; the fact that they do not fill up the field is quite unimportant; and the final result is in every way unsatisfactory and hopelessly bad. Until such first principles as those I have shown to be what the old men followed be adopted and practised, no good result can be looked for. Another feature of the old heraldry which it is well to bear in mind is the sparing use of that method of combining the arms of two or more person or families in the same shield, which is known as "quartering." One of the oldest examples of this occurs on the tomb of Queen Eleanor, the consort of Edward I., in Westminster Abbey, where her paternal arms of Castile and Leon are so arranged. So long as the shield contained four quarters only, of which the first and fourth and the second and third were respectively alike, the effect was often good, as in the case just noticed, and in the beautiful royal arms of Edward III. But where, as became common in the 15th century, these quarters were multiplied or subdivided, the artistic effect of the old simple shields was destroyed. As the principle was further abused, especially in the Elizabethan and Stuart periods, the whole became more and more confused in appearance, until the field rather resembled a piece of Turkey carpet than a combination of various arms, each more or less beautiful in itself. Another cause of the bad effect of much modern heraldry is to be found in the rules laid down in some of the textbooks and manuals as to the relative widths of the ordinaries and sub-ordinaries. The old heralds certainly did not fetter themselves with such restrictions. A bend or a chevron or a cross, whether alone or charged, was drawn of the best proportion to look well. If placed between other charges it was drawn narrower, if itself uncharged, and thus took its proper relative position with respect to the size and arrangement of the charges. So, too, with a bordure: if uncharged, or merely compoony, it was drawn very narrow; and even if charged, it was not allowed a much greater width. It thus never unduly intruded itself upon the other charges of the shield, and yet continued an artistic addition in itself. In many ancient heraldic shields, especially in painted glass, and to a lesser extent in carved work, the uncharged surfaces of the field or ordinary are sometimes relieved by covering them with the purely ornamental decoration known as "diapering." This beautiful treatment has, happily, been largely revived of late years by the glass painters, who use it very successfully, probably from the ease with which, in their case, it can be applied. Carvers, like their Mediæval predecessors, use it very sparingly; this is perhaps as it should be. Diapering requires to be done with great skill in sculpture to look well, and a careful study of old examples is advisable, in order to thoroughly understand the principles of its application. Some of the finest diapered shields we have occur on the splendid monument of Lady Eleanor Perry, in Beverley Minster. A few good instances are also to be met with on seals. It is, of course, to be borne in mind that diapering is merely a relieving of the surface, and it must not be emphasised by a difference of colour, or treated with such prominence as to render it liable to be mistaken for a charge or charges. I must now say a few words concerning crests, the meaning and use of which seem to have been almost entirely forgotten. A crest was originally, as its name reminds us, a tuft or plume on the head of a bird. Such a tuft or plume in very early times was fixed as an ornament in the top of a helmet, of which it thus formed the crest. Other devices, such as could be conveniently so worn, were soon used for the same purpose, and by a perfectly natural process became associated with particular individuals. In later days, when the helmet enveloped the whole head, the crest played a useful part in revealing the wearer's identity, though his face was hidden. As the crest was thus so closely associated with the helm it was never by the individual heraldic artist represented separated from it except perhaps in some late examples of standards. So, too, the crest was always something that could be actually

worn; objects that were naturally too large or heavy being represented by models made in boiled leather (*cuir-bouilli*), wood, or other light material. Such impossible crests as the pictorial scenes and other absurdities granted by the heralds in this and the last century, and even back into Elizabethan times, would not even have been thought of at an earlier period while heraldry was a living art. The helm of which the crest formed part, was, it is hardly necessary to say, such a one as was included in the war harness of the time. In heraldry it was almost invariably shown in profile, the present custom of different types facing different ways to denote various grades of rank, being a comparatively recent one. In actual use the helm was often covered behind by a scarf of some kind, to temper the heat of the sun, like a modern puggaree. Heraldically this is represented by what is called the mantling. At first this was a simple affair, disposed puggaree fashion, as on the tomb of Edward, Prince of Wales, at Canterbury, but it was by degrees enlarged until it extended on either side beyond the helm, and was disposed in graceful twists and folds with jagged edges which are supposed to represent the cuts it was liable to receive in war. The usual colour for the mantling was red, and it was lined with ermine fur; but there is ample precedent for a difference of treatment, as may be seen in that wonderful storehouse of ancient heraldry, the stall-plates of the Knights of the Garter in St. George's Chapel, Windsor, where mantlings of various colours, and powdered with badges or formed of feathers, occur. Of wreaths, coronets, and the caps of maintenance usually associated with helms and crests I need not say much. The history of their origin and use really belongs to the grammar of heraldry. Good examples, as models, should, however, be looked for, and of these there is, fortunately, no lack, as, for instance, the stall-plates at Windsor, or the beautiful plates of monumental effigies published by Stothard and the brothers Hollis. From what I have said as to the invariable ancient close association of helm and crest, it follows that the modern fashion of representing the crest by itself, without the helm, is entirely wrong. It at once renders the crest meaningless; in appearance it forthwith becomes insignificant, and any attempt to treat it artistically is usually a failure. Let crests be shown as crests, with practicable helms beneath them, and with the mantling treated with all the freedom that it is capable of. Crests, unfortunately, do not stand alone, as regards their misuse, for modern artists are equally at sea as to the proper treatment of supporters. These charming adjuncts to heraldic compositions no doubt originated in the animals or monsters often introduced on early circular seals, to fill up the space between the shield and the surrounding margin. A very slight exercise of the engraver's inventive powers represented these beasts as holding the shield itself, and thus they became the supporters of it. Once invented, they were very popular, and many grand examples occur on seals and monuments. In those mediæval instances where the shield is surmounted by, and more or less subordinate to, the helm, crest, and mantling, the supporters invariably uphold the helm, as being the heavier and uppermost object, the shield being assumed to depend from it. But whatever the thing supported, whether a shield alone, or the helm and crest and shield combined, it ought not to be forgotten that the duty of supporters is to uphold and support. Nowadays, however, especially in representations of the royal arms, the so-called "supporters" often do not support anything, but are degraded into a pair of cowering beasts at the base of the shield, like the lion and unicorn over the door of the new National Portrait Gallery. The depth of heraldic degradation could hardly be illustrated better than by this very recent representation of royal arms. In marked contrast to them are the boldly sculptured arms of George I. (1726) over the portico of St. Martin's Church hard by. During the 15th and 16th centuries a pretty fashion prevailed of utilising heraldic creatures generally as supporters or bearers of banners, which were often charged with arms or devices. Some of you may be familiar with the great examples at the corners of the tomb in Westminster Abbey of Lewis Robsart, Lord Bouchier, who died in 1431. In this case large quartered banners-of-arms, the poles of which are ingeniously worked into the buttresses, are held by lions and falcons alternately. Some beautiful examples also occur on seals. In archi-

\* From a paper read before the Applied Art Section, Society of Arts, on Tuesday, January 26, 1897.



lecture these banner-bearing creatures were often used with happy effect as terminals to buttresses or pinnacles, and in other suitable places. The buttresses of St. George's Chapel, Windsor, for instance, were once surmounted by stone figures of the "King's beasts," as they were called, holding long rods with gilt vanes, the effect of which as they turned with the wind in the sun must have been very pretty. Similar figures also formerly stood on stone bases at the angles of the trim little walks in the privy garden at Hampton Court. The use of banners for the display of armorial bearings might with advantage be more widely adopted. Everyone is familiar with the banner of the royal arms, which is so wrongly called the Royal Standard, and with our splendid national naval banner, better known as the Union Jack. Many of you, too, may have noticed the banner with the arms of the City of London, which floats above the Mansion House when the Lord Mayor is in residence. Let a banner once be regarded in the light of a rectangular shield, and its fitness for armorial bearings directly becomes apparent. Mediæval banners of arms were usually placed upright—that is, with the long side next the staff, and in this form they have an excellent decorative effect. At a later date they became square, and then longer than they were high, so reversing the old state of things. In practice it will be found that though this latest form is convenient when the banner is used as a flag, so it is not always easy to arrange the arms on it that they will look well. In the royal banner, for example, although the lions of England may be sufficiently elongated and attenuated to fill up the quarters allotted to them, it is very difficult to properly display the lion rampant of Scotland in a space which is more suitable for a lion passant. Had the banner been of the old form, or even square, no difficulties whatever would have arisen. Whatever be their shape, banners, like shields, ought, as a rule, to be completely covered with the heraldry, like the banners of the Knights of the Garter at Windsor. Examples, however, are not wanting, even in the 15th century, of banners charged with regular heraldic achievements, sometimes on striped or parti-coloured fields. Banners were generally bordered with a narrow fringe, either of gold or of the principal colour and metal of the arms displayed upon them. Of the curious long and tapering banners called "standards," which were so popular in the 15th and 16th centuries, and of the badges for the display of which they were chiefly used, a very interesting chapter might be written. The whole history of badges is of itself one of great interest, and the facility with which badges lend themselves to artistic heraldic decoration renders them of peculiar value. A badge is, properly speaking, any figure or device that is assumed as the distinctive mark or cognisance of an individual or family; and it should be borne alone, without any shield, torse, or other accessory. A badge, however, may be, and often was, accompanied by a motto. The wearing of a man's badge by his dependants still survives in the "crest" on the buttons of liveried servants, and were the torse or wreath on which it is placed omitted, the "crest" would at once become a badge. Seeing that a crest was pre-eminently the personal device of its wearer, it needs but little consideration to show that what was once an ensign of honour ought not to be degraded to a mark of servitude. Badges were anciently used as ornaments, or ornamental devices, in every conceivable way, and on almost every conceivable kind of object, and now that crests are no longer actually worn, the revival and use of badges is a subject worthy of consideration. A point that is often overlooked in modern heraldry is the proper way of drawing the various creatures that are used in arms, crests, badges, and supporters. Since heraldry is but a survival of what was once a living thing, it is clear that, if our work is to look well, we ought to draw our animals in a more or less conventional manner. Some creatures, such as dogs, elephants, falcons, &c., may be drawn almost directly from nature; but others, especially lions, if so represented, would be manifestly unfit to consort with the dragons, the gryphons, the double-headed eagles, and other queer creations of the early heralds. The conventional treatment should not, however, be carried to excess, nor should natural forms be too closely copied. Here, as in other matters connected with heraldry, a comparative study of good ancient examples will soon show what are the best types to follow. Before concluding,

I would like to call attention to one of the many interesting facts that a comparative study of ancient heraldry will soon disclose, and that is, the way in which our forefathers, as it were, played with heraldry. They were not content with confining it to its original use as an aid to recognition in the field or in the lists, but on their seals, their weapons, their garments and vestments, their jewels, their plate and furniture, their carpets, hangings, and cushions, in the windows and on the walls of their houses, in their churches, and on their tombs, every kind of heraldic decoration was used with the utmost profusion. With many of these forms of application most of you are familiar from the examples we are still so fortunate to possess, but for some we must go further afield. Where, for instance, can we see the like of the great bed of black satin embroidered with gold roses and the white lions of the House of March, with escutcheons of Mortimer and Ulster, that was bequeathed by Edmund Mortimer, Earl of March, in 1380; or such jewelry as the brooch of Stafford Knots, left to his daughter in 1385, by Hugh, Earl of Stafford? Who could now, like Richard, Earl of Arundel, in 1392, bequeath such articles as a blue bed with the arms of himself and his late wife; the hangings of his hall, of blue tapestry with the arms of his three sons-in-law; and a pair of silver basons with his arms emblazoned at the bottom? We read, too, of such legacies as that of Eleanor de Bohun, the wife of Thomas of Woodstock, of a psalter with clasps of gold enamelled with white swans—the badge of her house—and with the arms of her lord and father, and ornamented with gold mullets, such as were borne in her paternal arms. Again, Edward the Black Prince—among other bequests to the cathedral church of Canterbury—left a chalice of gold with his arms on the foot, two basons with his arms, a great gilt and enamelled chalice with the arms of Warrene, and his "halling" of black tapestry powdered with his ostrich feather badge, with a red border with swans with ladies' heads. He also left, for the use of his chantry priests, a mass book and a porthos, which he had caused to be illuminated in divers places with his arms and "our badges of ostrich feathers." These are but a few specimens taken quite at random, such as may be gleaned from any collection of wills or inventories; but they are enough to show, with the many examples of heraldic decoration in our churches, our museums, and elsewhere, that our forefathers knew better than merely to paint their arms on the panels of their carriages, or engrave a helmetless crest on their spoons and forks, or emboss the same feeble device on the buttons of their men-servants. This bald and paltry treatment of a really beautiful art, which is generally all that it receives nowadays, ought surely to be amended. That heraldry is becoming more and more popular daily there can be no doubt whatever, and with its increasing popularity there must come a greater appreciation of its many beautiful forms of application. If there should be concurrently with such a revival a corresponding improvement in the artistic treatment of heraldry, we may yet again see folk so alive to its merits as to wear heraldic ornaments, and embroider their bed-quilts with arms and mottoes, and have their badges woven into their carpets and hangings. People are proud of their ancestral homes, their old furniture, their pictures and plate, why should they not show their pride in their armorial bearings by displaying them in every legitimate and artistic manner?

#### NOTES FROM PARIS.

THE new building in the Rue Blanche, constructed for the Society of Civil Engineers of France, was inaugurated on the 14th inst. by the President of the Republic. The plans for the building were adopted on March 28th of last year, and the premises were handed over to the society on the 14th of this month; the work of construction, decoration, and furnishing was therefore done in the incredibly short time of 262 days, a feat of which the architect, M. Fernand Delmas, is rightfully proud. The new hotel occupies a superficies of 7,609ft., the building lately occupied by the society in the Cité Rouge-mont covering 2,100 only. The large congress hall of the new building is capable of containing the whole of the old building, now sold to, and occupied by, the Société des Gens de Lettres. The basement contains the archives of the society, the

heating apparatus, and the machinery for raising or lowering the floor of the congress hall. The ground floor is divided up into a vestibule, rooms for the concierge, cloak-rooms, and the large hall, occupying a surface of 2,330ft., the floor of which is ingeniously arranged by means of a system of counterbalance machinery for raising to a horizontal position for ball-room purposes, &c., or lowering to an inclined position for congress meetings. The first floor is divided up into offices for the society and a large committee-room; the entresol is given up to club purposes for the members of the society, and to letting to outside societies for meeting purposes; the second floor, and a low story above this, is entirely devoted to the library and book depots; the third floor is given up to the general secretary for his "appartement." The façade has not been designed in any special style. The architect has evidently considered that such a building should, before all things, have a marked utilitarian character, plainly showing on its exterior the various interior arrangements of plan. The resulting façade is simple but pleasing, and the immense central bay, filled in with ironwork, and rising from the pavement to the cornice, gives much character to the design.

The new building for the theatre of the Opera Comique is approaching completion as far as the construction is concerned. The various designs for the decoration of the interior are now being prepared, but the theatre hall itself will scarcely be completed before 1898, the inauguration taking place early in 1899.

The principal artists who exhibit each year in the section of objects of art at the salons of the Champ de Mars and Champs Elysées have addressed a petition to the Director of Fine Arts, requesting that the various sections of objects of art be grouped at the Exposition of 1900 in the same manner as they are at present grouped at the two salons, and also that a distinct section of objects of art be adjoined to the section of fine arts at the coming exposition. This petition is signed by MM. Cazin, Puvis de Chavannes, Dampé, Grasset, and other well-known followers of modern art.

Much concern has been shown by the usual exhibitors at the salons as to where they should hold their annual exhibitions for the next three years; for, in both cases, the buildings of the Champ de Mars and the Champs Elysées have been given up to demolition in view of the Exposition of 1900. It was proposed to construct a large, but temporary, building on the Place du Carrousel, for the purpose of housing both salons during the time necessary for the construction of the new palaces of fine arts; but, happily, the scheme has been abandoned, at least for the present, for such a building, however elegantly it might have been designed and constructed, would have had a disastrous effect on the fine Place de Carrousel. It has now been decided to leave standing for a short time such portion of the Palais de l'Industrie as may be useful for this year's salon; this exhibition will therefore be held, as usual, in this building, but the date of opening will be slightly advanced, the opening ceremony taking place on April 20th, and that of closing on June 8th. Works of architecture will, therefore, have to be sent in on March the 28th and 29th. It is not yet decided if the salon of the Champ de Mars will be held in the Palais de Beaux Arts, as usual, or at the Orangerie of the Tuileries.

The Luxembourg Museum, which has been closed to the public since some little time, will shortly be reopened, with the addition of two rooms, separated by a lateral gallery, paved with rich mosaic work and hung with old tapestry. This gallery will be devoted to sculpture exhibits and objects of art. One of the new rooms will be specially devoted to the works of foreign painters, the other will contain the Caillebotte collection, consisting of about forty impressionist paintings, by Claude Monet, Pissarro, Sisley, Edouard Manet, &c.

The works of restoring portions of the ancient theatre of Orange has now been completed, under the direction of M. Formigé, and next summer a representation of "Antigone" and of the "Erinyes" will be given. The Hemicycle theatre of Orange is the finest existing in Europe, and has remained in a much better state of preservation than that of Taormina in Italy, or that of Herod Atticus in Greece. The first six tiers of seats of the theatre of Orange are in a remarkable state of preservation; the upper tiers have, however, almost disappeared, and the vaults supporting the right and left wings of the stage had crumbled away, allowing the southern mistral to blow into the theatre.



These vaults have now been rebuilt, and the tiers of seats restored to a certain extent, permitting the acting of a series of ancient plays next summer.

The remains of the celebrated Pasteur have lately been transferred from the cathedral of Notre Dame to the handsome crypt constructed under the Pasteur Institute in the Rue Dutot. The tomb is situated in the axis of the principal building, and was designed by M. Girault, the chief architect of the new Palaces of Fine Arts now being constructed in the Champs Elysées. The style of the work is Romanesque, and the ensemble shows proof of the architect's perfect taste in the arrangement and decoration of the crypt. A staircase of white marble, under a vaulted ceiling, leads to the nave of the small chapel, in the centre of which is the sarcophagus, made of black marble. The four angles of the vaulted ceiling rest on soberly-coloured marble columns, with white marble capitals, carved in Byzantine style. A small apse adjoining the chapel contains a white marble altar. The walls of the crypt are covered with veined white marble, holding the inscriptions, relating the life and work of Pasteur. The vaults are covered with mosaic work, with gold ground, recalling the scenes illustrating the principal discoveries of Pasteur, whilst the four angles of the principal vault hold figures symbolical of Faith, Hope, Charity, and Science.

The competition in modelling, between students of architecture at the Ecole des Beaux Arts, was for a marble vase, destined to form portion of the decoration of the vestibule of a museum. The vase should be placed on an isolated pedestal, and its decoration should represent, by means of figures in high or low relief, the three arts—painting, sculpture, and architecture. The height of the vase, without its pedestal, should be 6ft. The first medal, and a prize in money, was awarded to M. Violet for his clay sketch, done in six days, of an elegantly-designed vase, surrounded by a number of children's figures, and three gracefully-posed and skilfully-modelled nude figures representing the three arts. M. Dehaudt carried off the second medal for a vase of more Classic form.

The Godebœuf competition at the Ecole des Beaux Arts was for a decorative bay window to be placed on the front of a five-story house. The programme stated that, for some years past it had become customary in France, and especially at Paris, to decorate the façades of large houses with a kind of verandah, whose principal use was to increase the size of the rooms on the street front, and, at the same time, to allow a certain amount of decoration in the interior, and additional brightness to the rooms by reason of the flowers and plants which may be placed in the verandah; that the bay window had its origin in the East, but its recent introduction into France was directly due to English influence. However, the style of bow or bay window produced at Paris up to the present was by no means satisfactory, and might hardly be called a decorative addition to the façade of a building; it would be, therefore, well to make a special study of this new feature. The prize was carried off by M. A. Bruel, for a cleverly-designed window mounting the three stories of a five-story house, Louis XV. in style, and constructed of stone with wrought-iron balustrading.

## STABLE CONSTRUCTION AND SANITATION.—II.\*

IN the construction of stables, &c., care should be taken that the interiors of the buildings are rendered permanently weatherproof and free from damp. To effect this object, it is necessary to prevent any ground moisture or vapour rising through the floor and foundations of the walls, nor should any moisture be capable of being driven from the outside through the walls themselves in wet and stormy weather. The floor-level of the stable must be higher than the ground level. The whole area inclosed by the stable walls should be excavated to the requisite depth, and a layer of hard, dry, broken brick rubbish, about 6in. thick, spread over the entire surface and well rammed. A bed of Portland cement concrete from 4in. to 6in. thick should then be laid upon the brick rubbish, the surface of the concrete being floated to proper falls ready to receive the stable paving. The finished surface may be of brick, concrete, or other material; but

the selection of a suitable stable-paving will be further considered. Where this method of forming the stable floor is properly carried out, there will be no danger of ground-moisture or noxious vapours arising through the floor itself.



FIG. 2.

The walls of stables, whether of brick or stone, are usually built solid; but to obtain a perfectly dry building, it is far better that the whole of the external walls be built with what are known as hollow walls, having a 2½in. cavity. For ordinary purposes the inner portion of the wall should be 9in. thick, the outer skin being 4½in. thick. The total thickness of the external walls would then be about 16in., including a 2½in. cavity or hollow space. In addition to the prevention of wet driving through the walls, buildings constructed with cavity walls are warmer in



FIG. 3.

winter and cooler in summer than similar buildings built with solid walls. Care must be taken that the two thicknesses of the wall are well tied together by means of iron ties (see Figs. 2 and 3), or properly-designed bonding bricks of vitrified stoneware similar to those shown in Figs. 4 and 5. The bonding bricks or ties should be arranged chequerwise about 2ft. 3in. apart, and every fourth course in height. Fig. 6 shows the general arrangement for a 16in. hollow wall.

The cavity or air-space should be carried round the angles of the building, the only connection between the outer and inner wall being formed by the ties or bonding bricks. The cavity should

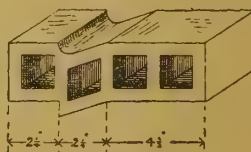


FIG. 4.

also be carried down to a depth of about 12in. below the damp-proof course, so that moisture may not pass from the outer to the inner wall near the ground level. Over the arch of every door and window opening a strip of 4lb. lead, 5in. wide should be built 2½in. into the exterior wall, and project about 2in. into the air-space, the inside edge being slightly turned up. The lead strip should be carried 2in. or 3in. beyond the frames each way, so that any water penetrating the cavity may be conducted clear of the frames.

The internal or division walls should be built

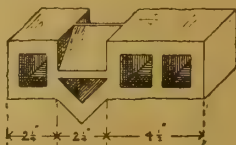


FIG. 5.

solid, with a minimum thickness of 9in. The foundations of all walls must be sufficiently deep and wide to give stability to the entire structure.

Where solid walls are used in exposed positions, any driving of rain or moisture through them may be prevented by rendering the walls on the outside with cement or by fixing hanging tiles or slates.

A damp-proof course should be provided to all the walls so as to prevent any damp or moisture from the ground rising up them by capillary attraction. The damp-proof course must be placed just above the ground level, and extend through the entire thickness of the wall (see

Fig. 6). A double course of countess or duchess slates bedded in Portland cement, and having the upper course breaking joint with lower course of slates, forms an excellent damp-proof course. A layer of asphalt ½in. thick is also used for the same purpose.

The external angles of all door and window openings should be well rounded. This is most satisfactorily effected by the use of specially made round-ended or bull-nosed bricks, as shown in Figs. 7 and 8 respectively. By this means any risk of injury to horses from contact with a sharp angle or arris is avoided.

## VENTILATION.

An ample supply of pure air is a necessity for respiratory purposes, and if animals which are confined in stables for a large portion of their existence are to be maintained in the highest state of health and efficiency, means must be adopted to insure that the air within the building shall at all times be approximately of the same degree of purity as the external air. This is the primary object to be attained in the ventilation of all buildings; but it is also essential that the ventilation of the building shall be effected without danger or discomfort to the occupants.

The chief conditions to be fulfilled by an efficient system of ventilation are as follow, viz.:—1. The internal air of a building must be continuously and

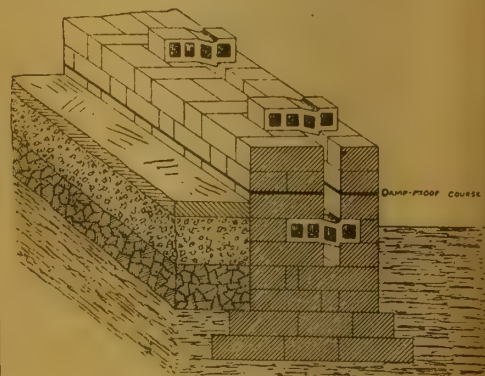


FIG. 6.

imperceptibly changed, the vitiated air being removed and replaced with pure air in such quantities that the normal composition of the external atmosphere may be maintained within the building. 2. The continual changing of the internal air should be brought about by such means that the temperature and humidity of the air within the building are conducive to health and comfort.

The various methods adopted for ventilating



FIG. 7.

buildings are broadly divided into two classes, and respectively designated *natural ventilation* or *artificial ventilation*, according to the general principles involved.

Any system by which the fresh air is supplied and the vitiated air removed by natural means, without necessitating a constant expenditure for labour or materials, is known as *natural ventilation*.

*Artificial Ventilation* includes all the methods in which the air is renewed by means of machinery or appliances requiring a continual outlay for labour or materials expended in producing the amount of ventilation required.

Artificial ventilation is not adapted for ordinary purposes, owing to the cost involved in the working expenditure and superintendence of the apparatus or machinery. The liability of the working parts to get out of order is also another drawback, and its use is generally confined to large institutions and public buildings.

For stables and buildings of a similar character, a good method of natural ventilation is the simplest and most inexpensive, and if properly designed and carried out will prove satisfactory



in practice. It is, therefore, proposed to consider only the method of securing efficient ventilation to stables by natural means.

**Volume of Air required for Respiratory Purposes.**  
—In the process of respiration by men and animals, large quantities of oxygen are absorbed from the atmosphere, whilst carbonic acid, watery vapour, and effete organic matters are given off. The average composition of air of normal purity is found by analysis to be as follows, viz.—

Parts by Volume.	
Oxygen.....	20·96
Nitrogen.....	79·90
Carbonic acid.....	·04
Watery vapour.....	Variable
Ammonia.....	Traces
Organic matters.....	Traces
Ozone.....	Traces

100·00

It has been ascertained that a horse, in the process of respiration, absorbs about 2 per cent. of the oxygen contained in the air inhaled by the lungs, and gives off a nearly corresponding amount of carbonic acid—in other words, after respiration, the oxygen of the air has been reduced from 20·96 per cent. to about 19 per cent., and the amount of carbonic acid has been increased from ·04 per cent. to 2 per cent., whilst at the same time a comparatively large quantity of watery vapour and organic matter has also been given off. Such vitiated air, unless immediately restored to a similar composition as that of air in its natural state, is quite unsuitable for breathing purposes. Accordingly, the excess of organic matter and carbonic acid must be greatly reduced, and the deficient quantity of oxygen made good by the introduction and intimate commingling with large volumes of fresh air, so that the average proportions of oxygen, organic matter, and carbonic acid found in the ordinary atmosphere may be approximately maintained.

It is found that air in which the oxygen has been reduced from 20·96 per cent. to 7 per cent. is totally unfit to support life, whilst the presence of 5 to 10 per cent. of carbonic acid in the atmosphere produces fatal results. The disagreeable feeling of closeness experienced when breathing in badly-ventilated buildings is due to the excess of organic matter present in the air. As the amount of carbonic acid produced by respiration bears—for all practical purposes—a constant and direct ratio to the quantity of organic impurities present in expired air, it is usual to consider the amount of carbonic acid present in the air of inhabited buildings as indicating the measure of its purity and fitness for breathing purposes. It is now generally acknowledged that air containing 50 per cent. more carbonic acid than is found in the ordinary atmosphere is impure and unfit for healthful respiration. The normal quantity of carbonic-acid gas present in air is ·04 per cent. (or 4c.ft. of carbonic-acid gas in every 10,000c.ft. of air). Consequently the ventilation of buildings must be so arranged that at no time there shall be more than ·02 per cent. of carbonic acid (or 2c.ft. per 10,000c.ft. of air) present in the air, in addition to the normal amount which the atmosphere contains in its natural state.

The average amount of carbonic-acid gas given off by a horse when at rest in the stable is about 2·5c.ft. per hour. The quantity of fresh air required to be supplied per horse per hour in order that the amount of carbonic-acid gas present in the air at any time may not exceed a total of ·06 per cent. (or an addition of ·0002 per cubic foot of air) may be calculated by means of De Chau-mont's formula, viz. :—

$$D = \frac{E}{F}$$

Where—

D = Volume of fresh air in cubic feet per hour per horse.

E = Amount of carbonic-acid gas exhaled per hour. (In the case of a horse this amount is 2·5c.ft.)

F = Maximum amount of respiratory impurity allowed per cubic foot of air. (This limit is usually fixed at ·0002.)

Or—

Volume of fresh air required per horse per hour

$$= \frac{2·5}{·0002}$$

Volume of fresh air required per horse per hour

$$= 12,500c.ft.$$

For general purposes, however, it is assumed that an allowance of 10,000c.ft. of fresh air per horse per hour will prove sufficient; but for sick

horses the allowance of air should be largely increased. The amount stated—viz., 10,000c.ft. of fresh air per horse per hour—should be considered as the minimum quantity necessary for the maintenance of health, and it is desirable that this amount should be increased to 12,000c.ft. or 14,000c.ft. per hour where practicable.

**Cubic Contents and Superficial Area.**—Having ascertained the volume of air required for respiratory purposes, it becomes necessary to consider the provision of this amount in connection with the cubic space which is available for each animal confined within the building. If a space of 10,000c.ft. could be provided for each horse it would only be necessary to change the internal air once an hour; whilst if 1,000c.ft. of space is the utmost that can be provided, the air must be renewed at least ten times within the hour in



FIG. 8.

order to furnish the minimum volume of fresh air which is considered necessary for the proper preservation of a thoroughly sound body.

It has been found by experiment that with ordinary methods of natural ventilation the air of a room occupied by human beings cannot be changed oftener than three or four times an hour without a risk of creating draughts, which are both objectionable and dangerous to health. In the case of stables, the air may be changed five or six times an hour without injurious results, as horses are not so susceptible to draughts.

Taking 10,000c.ft. as the minimum allowance of fresh air per horse per hour, and six times per hour as the extreme limit permissible for changing the air of stables, we have :—

$$\text{Minimum cubic space per horse} = \frac{10,000}{6} = 1,666c.ft.$$

In the ventilation of buildings it is frequently assumed that, provided the cubic space is not decreased, the floor area may be reduced if the height of the room or building is correspondingly increased. This is a grave error, as it is essential for the purpose of respiration that adequate superficial space shall be provided. A height of 14ft. may be regarded as the extreme limit to be allowed when calculating the effective air space for stables. Any additional space above this level cannot reasonably be considered as available for breathing purposes. It must not be understood that this represents the extreme height that stables should be built, for they may be made much loftier with advantage, but such additional height should not be regarded as affording additional effective breathing space. Any increased height would, however, tend to assist in the more thorough ventilation of the stable, whilst at the same time it would be rendered much more airy and comfortable.

It is desirable that the floor area of stables should not be less than one-twelfth the effective cubic air space; but taking 1,666c.ft. as the minimum amount of space required per horse for thorough ventilation purposes if they are to be maintained in a perfectly robust state of health, and 14ft. as the extreme height for effective breathing space, then it will be observed that

$$\text{Minimum allowance of floor space per horse} = \frac{1,666}{14}$$

$$\text{Minimum allowance of floor space per horse} = 119sup.ft.$$

In the construction of infirmaries stables it is necessary that the cubic space and floor area allowed per horse should be largely increased, as in some diseases a sick horse gives off two or three times as much carbonic acid and organic matter as in a state of health.

For purposes of comparison, it may be mentioned that in the construction of French cavalry stables a space of 1,750c.ft. is allowed per horse, whilst the minimum amount of cubic space and floor area per horse to be provided in army stables in this country is laid down at 1,600c.ft., and 100 superficial feet respectively. For army infirmaries stables 1,800c.ft., with a floor area of 120 superficial feet per horse, is allowed. In the case of sick boxes this allowance is still further in-

creased to 2,500c.ft. and a superficial area of 204ft. per horse.

The following list, showing the floor area and cubic space which have been provided in a number of stables erected in various parts of the country, recently appeared in the *Canadian Architect and Builder*. Although incomplete as regards the ascertained cubical contents allowed per horse, yet it affords a useful table for reference.

STABLES ERECTED IN DIFFERENT PARTS OF THE COUNTRY.

Name.	Floor area per horse. Feet super.	Space per horse. Cubic feet.
Gifford Hall, stalls.....	120	1,680
Ditto, loose-boxes.....	216	3,020
Wretham Hall, loose-boxes.....	185	—
Froggnall, Kent, stalls.....	134	—
Moreton Hall, stalls.....	126	—
Ditto, loose-boxes.....	216	—
Cowesfield House, stalls.....	120	1,080
Ditto, loose-boxes.....	210	3,780
Easton Park, Suffolk, stalls.....	105	—
Ditto ditto, loose-boxes.....	150	—
Loch Inch Castle, stalls.....	130	—
Ditto ditto, loose-boxes.....	195 to 250	—
Claremont House, stalls.....	130	—
Copse Hill Hunting Stables, stalls.....	130	—
Ditto ditto, loose-boxes.....	186	—
Berkswell Hall, stalls.....	128	—
Ditto ditto, loose-boxes.....	190	—
Havering-atte-Bowe, stalls.....	147	—
Ditto ditto, loose-boxes.....	120	—
Private stables at Brighton, stalls.....	95	—
Ditto ditto, loose-boxes.....	193	—
Private stables in London, stalls.....	84	798
Ditto ditto, loose-boxes.....	100	950

It will be seen that the floor area and cubic space provided per horse in city stables of average construction as given in the above table falls considerably below the standard already laid down; but, on the other hand, in the country stables mentioned the superficial area and cubic space in most cases exceed the minimum allowance which is considered necessary for proper sanitary efficiency.

Lieut.-General Sir F. W. Fitzwygram, in his well-known work, "Horses and Stables," gives the following interesting list of the cubical contents of various classes of stables erected in London, viz. :—

LIST OF VARIOUS STABLES ERECTED IN LONDON.

Name.	Amount of space allowed per horse. Cubic feet.
The Royal Mews.....	2,500
Marlborough House stables.....	1,700
South-Eastern Railway Company.....	1,540
Messrs. Reid and Co., Liquor-pond-street.....	1,250
London, Chatham, and Dover Railway Co.....	1,200
Great Western R.-lway Co.....	1,116
Messrs. East, Curzon-street.....	1,100
Messrs. Wimbush, Gillingham-street.....	980
Portland-place stables.....	950
London General Omnibus Co. (Ecclestone-place).....	820
Stables attached to gentlemen's houses (average).....	720
Mr. Birch's omnibus.....	700
Cab-horse stables (average).....	550

In his remarks respecting the average small amount of cubic space found to be allowed per horse in cab-stables, General Sir F. W. Fitzwygram draws attention to the fact that the horses spend nearly half the twenty-four hours in the open air, the stables being well ventilated and drained, whilst in some of them the windows are entirely removed, and the doors left wide open at night so as to secure adequate ventilation. The same authority also gives the following list, showing the cubical contents of various military stables which have been built at different times, viz. :—

MILITARY STABLES.

Name.	Amount of space allowed per horse. Cubic feet.
Hyde Park Barracks (new) maximum.....	2,284
Ditto ditto minimum.....	1,452
Ditto ditto average.....	1,781
Regent's Park Barracks (new).....	1,461
Aldershot Cavalry Barracks.....	1,034
Aldershot Army Service Corps.....	1,464
Colchester, Cavalry, open roof.....	1,405
Colchester, Cavalry, rooms over.....	1,296
Colchester Artillery.....	1,336
Dublin, Island Bridge.....	783
Dublin Royal Barracks.....	560
Ditto ditto Officers (new).....	1,730
Glasgow (new).....	1,462
Hounslow.....	630
Manchester.....	798
Norwich.....	735
Windsor (old).....	739
Woolwich (new model).....	1,793
York (old).....	740
York (new), with room over.....	1,122
York (new), open roof.....	1,546

In the construction of cow-houses, the minimum amount of space to be provided for each cow



should be taken at 1,000c.ft., with a minimum floor area of one-twelfth the cubic air space, or 84 superficial feet.

#### THE SURVEYORS' INSTITUTION.

THE discussion on the paper read by Mr. Howard Martin at the last meeting of this society, on the "Future Developments of the Surveyors' Institution," was resumed at the meeting of Monday evening last by Mr. C. J. Mann, who said that on hearing the paper read he had felt himself more competent to make suggestions than, on careful consideration of it, he found himself to be. The value of the Institution was shown by its rapid growth, its wide support received from all parts of the country, and its general acceptance as the centre of a very varied profession. The examinations had been a very practical factor in its success, and the maintenance of their efficiency was, he thought, vital to its existence, but he thought they might be made even more practicable than at present. It was true that, after the expenses incident on the rehousing of the Institution in their proposed new home in Westminster had been met, there would be no very large annual surplus of income over expenditure; but it was matter for congratulation that there should, after the outlay of some £32,000, be still a surplus of several hundreds, even if the Institution remained stationary as to membership. The money expended on the *Transactions*, and on the very valuable *Professional Notes* was, he felt sure, well spent. He thought it would be inadvisable to endeavour to establish a number of country libraries, but that the endeavour should be made to render the central library as perfect as possible. He agreed that a synopsis of the papers to be read would, if distributed before the meetings, tend to increase the value of the discussions. If also the president and council would from time to time hold receptions to which all members were invited, it would certainly tend to promote the feeling of solidarity which should run throughout a professional body.

Mr. J. A. Eggar said that, speaking as a country member, he thought the Institution even more useful to country members than to those in London. He did not altogether agree with a previous speaker that much would be gained by the members calling themselves "chartered" surveyors. The title, "Fellow of the Surveyors' Institution" was, he thought, a sufficiently recognised guarantee of a man's capability; but at the same time he should much like to see it a more general rule that, in all disputed cases, umpires should be definitely selected from among the Fellows of the Institution. The library should, he thought, be a good central one, and not divided into several local branches.

Mr. T. A. Dickson quite agreed with the last speaker's views as regarded the library of the Institution. In his own case it would take him about two hours and a half to reach the town which formed the centre of his district, and in which he supposed a local library would, if established, find its home; but at the same time he agreed that it would be well if members, on the payment of a small fee if necessary, could borrow books of reference from the library. The foundation of travelling scholarships was, he thought, rather a matter for a special gift or bequest than one coming under the head of general expenses. The fact that members were in the habit of affixing the letters F.S.I. to the title of their firms of which all were not Fellows of the Institution, was a regrettable one; but it was not easy to see how it could be avoided. In his opinion the foundation of the education of all surveyors should be a knowledge of surveying and levelling, and he would suggest that the test in this direction should be made more searching.

Mr. G. M. Freeman, Q.C., after a reference to the increased accommodation which the new premises would afford for members, said he thought it would be an immense advantage if those prepared to take part in the discussions could have beforehand some idea of the scope and direction of the author's treatment of his subject. He agreed with what had been said about the library, and thought that only under very exceptional circumstances should books be allowed to leave the library. He thought that perhaps a "catalogue raisonné," giving fuller details than was possible in an ordinary catalogue, might be valuable. The suggestion of periodical receptions by the president and council met with his entire approval, and he also thought that occasional provincial meetings would be useful. He did not

altogether think that scholarships of the kind suggested would do much to promote the interests of the profession or of the institution.

Mr. E. P. Squarey (past-president) said that, as one of the surviving members who assisted in laying the foundations of what was now so great and prosperous an Institution, he felt pleased to accord to the author his own personal thanks for his paper. It had been truly said that, capable and honest as the surveyors of thirty years ago were, their one great want was organisation, and this the Institution had supplied. The value of their publications—the *Transactions* and the most useful *Professional Notes*—could not be over-estimated, and that value was equally great to country as to town members.

Mr. A. King considered the growth of the Institution and its present substantial position a matter of congratulation among the members; but he was not quite sure that the estimated surplus left quite enough margin for contingencies. It was true that this estimate was based on the lowest possible, or probable, figures, and that, in fact, it might be much exceeded.

Mr. H. Hayward, speaking as a country member, did not think that country members were at a disadvantage as compared with those in town.

Mr. H. C. Clarke quite agreed with the last speaker, but thought that it would be advantageous to have lectures on subjects of professional practice so arranged that country as well as town candidates for examination could attend them.

Mr. J. H. Sherwin, Mr. G. N. Hooper, and Mr. H. H. Collins having spoken, and the President having summed up the discussion, the meeting was, after a reply by Mr. Howard Martin, then adjourned.

#### ARCHITECTS' JOINERY.

MR. F. A. FAWKES, of Chelmsford, has issued a revised and enlarged edition of his work on Architects' Joinery. We have on former occasions noticed the excellent joinery turned out by Mr. Fawkes, both as regards design and execution. In this edition the author has brought together the various joinery catalogues, and many new designs are inserted which will meet with the approval of the architect in the Renaissance styles. He cannot fail to select what he wants. The mouldings are particularly sharp and cleanly turned out, and in these particulars compare favourably with the best work. Only the best seasoned timber is used. The work contains various examples of plain and enriched mouldings, priced at per 100ft. run, suitable for panels, architraves, dado rails, picture rails, skirtings, and cornices. Many of these are good in design and contour which an architect would have no hesitation in using. They are all given full size. The enriched dado rails are in great variety of size and moulding, the enrichments being fixed to the wood mouldings, and made of a tough composition which is not liable to crack or chip like plaster, and is very durable. The enriched designs are photographed half full-size from the original mouldings, and give a very correct idea of the effect of the ornamentation, which comprises every kind of Classical ornament. The architrave mouldings in sets cut to proper lengths for doors up to 7ft. by 3ft. base-blocks, are useful. Interior doors of every kind of framing, windows, dado panelling, combinations of doors and panelling, mantels of various designs are shown. Of the latter we see some very quiet and admirable treatments after good models. Others of more ornamental character with over-mantels, that will suit every taste. The suggested design for a screen is not so pleasing—the balusters look crowded. The testimonials from architects and others speak for themselves of the quality of the workmanship. Every design is numbered, so that its price can be obtained from the price list. For architects' builders and joiners this book will be found valuable, and it is published at 5s. by Mr. B. T. Batsford, of High Holborn.

#### THE GILLENDER BUILDING, NEW YORK.

ONE of the most recent fireproof office buildings of steel-cage construction in New York City is built at the corner of Wall and Nassau-streets (according to the *Engineering Record*), and has a frontage of 74ft. on the latter and 22ft. on the former, and secures ample light and air. From the first floor to the cellar floor the height is

29ft. 8in., and above this there are sixteen stories, besides two more in the central tower; the total height to apex about 310ft. to the grillage beams on top of piers. The main roof is 200ft. above the street level. The main front is emphasised in the centre with three arched bays, finished by pointed arches divided, the windows set back a few inches, which treatment brings into prominence the angles of the building, also pierced by one line of windows. Two rows of six steel columns each carry the floor and roof beams, and these are rigidly connected by bracing girders. The total weight of superstructure and allowed load is about 9,000 tons, and this load is transmitted through the 12 columns in the foundation piers. As the soil was loose wet sand, the columns were set on steel grillage beams, which helped to distribute the load on three masonry piers, each of which carries four columns. The piers are about 18ft. high, and were sunk below water-line by the pneumatic process. These caissons distribute the load over a large area of the hard "pan" at a pressure of only 12 tons per square foot; plans and details of the caissons and piers and cofferdam are given in the *Record*. The piers are built of brick in Portland cement, and levelled off under the I beams of the grillage with about 12in. of concrete. The beams and girders are painted and then coated with coal-tar, the whole covered with concrete. The walls of the adjoining buildings had to be underpinned, and as they were close to the caissons, the method adopted was to sink cylindrical iron piles under the walls by hydraulic jacks and jets, as we described in connection with the Queen's Building. The sections and elevations of the superstructure and the connections of girders with columns and other details are given in our contemporary. Messrs. Berg and Clark are the architects; Mr. Henry Post, Associate, is consulting engineer on the ironwork, and Mr. Charles T. Wills general contractor. The Pencoyd Bridge Co., Pa., and the Maryland Steel Co. supplied the iron and steel work. The drawings show rigidly connected lattice girders between the columns of every floor. The longitudinal wall girders also secure the structure, and these are made of chord angles, web vertical and diagonal angles. The wind pressure calculated for was a maximum of 30lb. per square foot of fixed distributed load normal to the wall surface. The lateral strains thus produced are resisted mainly by the transverse lattice and plate girders at every story between the columns just described.

#### ST. PANCRAS NEW CASUAL WARDS.

A NUMBER of ladies and gentlemen met on Saturday week to inspect the new casual wards for the parish, which have been erected in Holmes-road, Kentish Town, at a cost of nearly £11,000. The new wards will accommodate 48 males, 18 females, and six children. The site, which has a somewhat irregular shape, has a frontage of 125ft. to Holmes-road, and an average depth of 250ft. The front or official block is a red-brick structure occupying the centre of the frontage, and standing back in a wide forecourt with a cartway entrance on either side. To the rear of this block is the main building stretching away for a length of nearly 200ft. to the rear, and terminating in a railed yard communicating with the oakum store, sanitary offices, and the mill-room. The accommodation for males is on the ground floor, and each inmate is provided with a separate cell or sleeping apartment, which will be fitted with a hammock. The women have similar accommodation upon the upper floor, the apartments to be used by women with children being of larger area, and the whole fitted with beds in lieu of hammocks. The whole of the sleeping apartments are warmed by hot-water pipes efficiently ventilated, and in each is a push connected with an electric bell and indicator in the superintendent's office. Separate entrances are provided for each sex, with covered shelters for those who arrive before the regulation time. In the basement of the front block is a small laundry, suitably fitted by Messrs. Bradford and Co., in which the washing of the establishment will be done by the female casuals. Here, also, is a steam disinfectant, with boiler and other necessary appliances and the hot-water boilers for warming the building and for supplying the bath water. The grinding shed contains a central mill-room, with accommodation for 22 hand-mills and a flour dresser. Above the mill-room is a corn and flour store. The buildings generally



are of plain stock brickwork, but the block next Holmes-road has received somewhat more generous treatment, being faced with red bricks with moulded brick and stone dressings. The floors throughout are of concrete, so that the buildings are practically fireproof. The surface finish of the greater portion is limestone and cement, but the dayrooms and entrance lobbies are finished with Terrazzo and the officers' rooms with wood flooring. The buildings have been erected by Messrs. T. Gregory and Co., of Station Works, Clapham Junction, from the plans and under the superintendence of Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C., Mr. Geo. Poole acting as clerk of works. The contract sum was £10,697.

#### PETERBOROUGH CATHEDRAL.

A SPECIAL visit to Peterborough Cathedral, by permission of the Dean and Chapter, is being arranged for members of the Royal Institute of British Architects, to enable those architects who desire to inspect the work in progress to do so at an early date. The following letter has been received by the architect Mr. J. L. Pearson, R.A., among many others of a similar tone addressed to him and the Dean and Chapter:—

To J. L. Pearson, R.A.

We the undersigned architects, desire to enter our protest against the attacks made upon you in a portion of the daily press, and to assure you of our complete confidence in you as adviser to the Dean and Chapter of Peterborough. Pray make any use of this that you please.

J. M. BRYDON, G. AITCHISON, A.R.A., WM. FAWCETT, C. F. HAYWARD, B. INGLELOW, JOHN SLATER, W. EMERSON, ED. W. MOUNTFORD, ALEX. GRAHAM, ASTON WEBB, JAMES BROOKS, HENRY L. FLORENCE, EDWARD A. GRUNING, J. ALFRED GOTCH, R. REYNOLDS ROWE, F. C. PENROSE, F.R.S., ERNEST GEORGE.

The above protest against the various and unreasonable attacks which have appeared during the past few weeks is almost exclusively signed by members of the Council of the Institute, but is not in any other sense an official document, and although a large number of representative names could at once have been obtained, no facilities were afforded to enable members to add their signatures. The Council was asked to co-operate with this view, but declined, and it is a pity that the opportunity was thus lost by divesting the protest of anything like the thorough character which the merits of the matter deserve.

#### BOOKS RECEIVED.

A *Textbook of the History of Architecture*, by A. D. F. HAMLIN, A.M., Adjunct-Professor of Architecture in the School of Mines, Columbia College (London: Longmans, Green, and Co.).—The author of this well-printed and copiously illustrated octavo sketches the various styles and periods of architecture, noticing only the most typical examples. As the work is ostensibly intended as a college textbook, the author summarises and condenses the material, and prefixes to each chapter a list of books recommended, which is a useful feature. Under Greek architecture we see the names of Reber, Beulé, "L'Acropole d'Athènes," Chipiez's "Histoire Critique des Ordres Grecs," Texier's "L'Asie Mineure," &c. We have the chapter divided into the following main sections: Prehistoric, The Orders, Polychromy, Greek Temples, Construction, Sculpture and Carving, Detail and Execution; Historic Development, including the Archaic, the Transitional, the Periclean, the Alexandrian, the Decadent, the Roman, which periods are severally described and illustrated by typical examples. This division into sections or paragraphs is generally followed in other styles, as in Gothic, though not always with discernment, as in placing details and features before plan, and its connection with vaulting. The photo-process blocks number 230; some of these are rather small, but well selected. On the whole, Professor Hamlin's handbook will be found useful for the student and general reader who wishes to master the salient features and types of each style. For principles and development of style the student will find more real help in such books as Viollet-le-Duc, Corroyer, Willis, or even Fergusson; but as an analysis or introduction Professor Hamlin's treatise possesses a certain value.—*Linear Perspective*, for the use of students, by G. A. T. MIDDLETON, A.R.I.B.A., M.S.A., &c. (London: B. T. Batsford).—This little treatise is a reprint of articles which appeared in an American contemporary, and will be found of service to the

student in clearing up difficulties in the pursuit of this very essential branch of the architect's profession. Mr. Middleton writes clearly and concisely, and anticipates those elementary difficulties which often beset the beginner in entering upon the subject of perspective. The fault of most treatises is their great length, and the number of geometrical definitions and enunciations with which they abound. The author goes directly into the subject in a scientific manner, treating it as an application of solid geometry or projection. Elementary principles are clearly put, such as the limits of the angle of vision both horizontally and vertically (or 60° on either side of visual ray, and 30° above the horizontal line), the principle of projection of a solid, the laws of vanishing lines and planes in parallel perspective, and the same object put into perspective by means of the plan. The diagrams and examples are well selected, and Mr. Middleton's little book will be found worth reading by all students who are endeavouring to master perspective. There are some useful remarks on shadows and reflections.—*The Architect's and Surveyor's Diary for 1897* (London: Waterlow Bros. and Layton) contains lists of the professional societies, and much other valuable matter.

—*The Cathedral Church of Canterbury*, edited by GLEESON WHITE (London: George Bell and Sons).

—This is one of the useful little volumes forming "Bell's Cathedral Series," which will be found interesting to all visitors of our cathedral churches. They will serve as something more reliable than the ordinary guide-books, occupying a position, in fact, between them and the costly monographs. The volume on Canterbury is well illustrated by photographs reproduced from originals by Messrs. Carl Norman and Co., and by illustrations of various portions and details. The photographic illustrations contain a general view, the cloisters, Christchurch Gate, Norman staircase, Tomb of Black Prince, and the choir, looking east. The descriptive letter-press appears to be carefully done, and quotations are made from reliable authorities and documents. A good plan, with references, is given. As a digest of the leading works on the Cathedral, this handbook will be welcome to many.—*The Cathedral Church of Salisbury*, in the same series, is also a résumé of the leading authorities, the works of the late Rev. W. H. Jones having been consulted. The illustrations are from photographs reproduced from the same firm's series.

The other illustrations and details are not so correct in drawing nor so artistic, and have been reduced from Carter's "Specimens of Ecclesiastical Architecture," and Britten's "Cathedrals." The volumes are well printed and bound, cost eighteen pence apiece, and are of handy size.—*Sanitary House Drainage*, by T. E. COLEMAN, surveyor, R.E. Civil Staff, M.S.A., &c. (London: E. and F. N. Spon, Strand), is a concisely-written manual on the principles and practice of house drainage for the use of architects, engineers, and builders. Mr. Coleman, whose series of articles appeared in the *Building News*, has collected and arranged the material in a convenient form for practical men. The chapters are well illustrated. The author gives useful suggestions for the ventilation, flushing, and cleansing of drains, and rightly insists on the disconnection of storm-water and foul drains, each forming a distinct section. A drainage plan for a small residence illustrates the lines of outside drains and their falls, untrapped gullies, grease traps, soil pipe, inspection chambers, intercepting chamber, &c. Sections are given of the latter chamber, also an automatic flushing chamber, fitted with Mr. Rogers Field's siphon. The remarks on gradients, sewage and storm-water, size of drains, jointing, laying drains, soil and waste pipes, traps, closets, cisterns, and other fixtures are generally to the point, and these details will be found practically dealt with, and the plans, sections, and diagrams are drawn to a good scale. As a practical hand-book on the subject, in which details have not been neglected, we can recommend Mr. Coleman's useful work to the notice of all readers.—*The Antiquary*, January (London: Elliot Stock). In addition to notes, reviews, &c., the "Ramblings of an Antiquary," by George Bailey, are descriptive of Hardwick Hall. The article is illustrated by views of this old historic residence now in ruins. It is of several dates, the additions being of the time of Henry VIII. "From London to Edinburgh," by the Rev. W. MacRitchie, is a chatty diary narrative. The "Five-storied Cliff Houses of Pompeii," by H. P. Fitzgerald Marriott, is an

interesting description of ruins unknown to most tourists. The ruins are those of large houses of considerable importance, and the author describes the excavated portions, and suggests further work in this direction. A rough sketch-plan and section are given.—*The Reliquary and Illustrated Archaeologist* for January, edited by J. ROMILLY ALLEN, F.S.A. (London: Bemrose and Sons, Ltd.), contains interesting papers on the "Kistvaens found in the Stewartry of Kirkcudbright," by Fred. R. Coles, F.S.A. Scot. "The Stourhood Collection in the Wilts Arch. Society's Museum at Devizes"; "Hop Tallies," by E. Lovett; "The Graves of Arakeiling, Strypes, Elginstone," by Hugh W. Young, F.S.A., &c. The illustrations and the typography are of the usual excellent quality.—*Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price-Book for 1897*. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. (London: Crosby Lockwood and Son).—This compendious and well-known price-book has been revised and brought up-to-date throughout. The advance on the rate of wages, owing to recent concessions of the masters, has been noted, and the markets of materials have been revised. The volume, which is now bulky, contains descriptive notices of all recent building and sanitary appliances, new materials, a section on electric lighting by A. P. Haslam, A.I.E.E.; the full text of the new Building Act, with annotations by Mr. A. J. David, L.I.M., of the Middle Temple; the regulations as to procedure and fees of the Tribunal of Appeal; list of district surveyors' regulations under the Metropolis Water Act, 1871; commissioners of sewers, &c., in addition to the tables of weights and measures, professional charges, marks of wood, valuation tables, and the latest form of building contract issued by the R.I.B.A. On the whole, Lockwood's Price-Book will be found a very necessary office handbook of all connected with the building trades for the profession and contractors.—We have received from the Secretary of the Science and Art Department, South Kensington, two paper-covered catalogues, the one of the Special Loan Collection of English Furniture and Figured Silks of the 17th and 18th centuries, exhibited at the Bethnal Green Branch Museum last summer, and the other of the Collection of Continental Porcelain lent by Sir A. Wollaston Franks, K.C.B., to the same museum. The former catalogue contains a list of over 500 pieces of furniture, besides the silk exhibits and designs. Ample descriptions accompany the objects, and Mr. J. Hungerford Pollen, M.A., has written a brief but lucid introduction. It is a matter for regret that the catalogue was not ready in time to be of service to visitors to this most instructive exhibition. Mr. T. F. Parkinson, the courteous keeper in charge at Bethnal Green, however, afforded every facility, and gave all information in his power. Sir A. Wollaston Franks describes the objects of his loan collection, and prefaces each section with introductory remarks.—*Sell's Directory of Registered Telegraphic Addresses*, National List of Large Commercial Houses and Buyers' Guide, price 21s., subscribers 18s. (Henry Sell, 167, Fleet-street, London, E.C.), is just issued. It is now twelve years since Mr. Sell began the onerous task of supplying commercial men with a list of telegraphic addresses, and it is astonishing to find that it now requires twelve hundred pages to contain the alphabetical lists of this work alone. It is practically a complete list of the firms whose telegraphic business is so important as to necessitate the registration at the Post Office of a code address. The work is compiled from official lists supplied by authority of the postmaster-general. Not only the telegraphic address of each firm is given, but also profession, postal address, telephone number, and telegraphic code used. Mr. Sell has added to the work a classified business directory, which has considerably grown since the last edition. A special feature of the work is the issue of quarterly supplements, which are sent without further charge to subscribers, and contain all new registrations, cancellations, and other alterations effected at the Post Office each quarter, bringing the information always up-to-date.

Mr. Thomas Brock, R.A., has been selected as sculptor of the life-sized statue of Tom Hughes, to be erected in Rugby School.

The Lerwick Burgh Commissioners have at present under consideration a water-supply scheme devised by Messrs. J. and A. Leslie and Reid, Edinburgh, and estimated to cost nearly £4,000.



### THE DIVERSION OF THE RIVER PERIYAR.

AT the ordinary meeting of the Institution of Civil Engineers, held on Tuesday, the 26th, Mr. J. Wolfe Barry, C.B., F.R.S., President, in the chair, a paper was read on "The Diversion of the Periyar," by Colonel J. Pennycook, C.S.I., late R.E. From time immemorial the Madura District of the Madras Presidency has suffered from want of water for irrigation, and it was proposed to meet this want by diverting the Periyar River from its natural course through Travancore into the Arabian Sea so as to traverse the valley of the Vaigai, which runs through Madura to the Bay of Bengal. The work involved the closure of the existing course of the river by a solid masonry dam, the provision of a passage for its waters through the mountain chain separating the watershed of the Bay of Bengal from that of the Arabian Sea, and the construction of the works required for the control and distribution of the water thus diverted for the purpose of irrigation in the Madura district. The dam for closing the existing bed of the Periyar had to be 178ft. in height, and the difficulties inherent in the construction of a work of this magnitude across a river with an average discharge of 1,200c.ft. per second, rising in floods to 25,000c.ft. per second, and on one recorded occasion to five times the latter amount, had been enhanced by the fact that the work had to be carried out in an uninhabited jungle, 20 miles from the nearest cultivated land and 80 miles from the nearest railway station. The climate also was so unhealthy that for three months in each year engineering operations on any but the smallest scale were impossible, while for six of the remaining nine, floods in the river were so frequent as to prohibit any attempt at work in its bed. The time available for getting in the foundations of the dam was thus practically limited to three months, with the certainty that all work not complete and solid by the end of this period would be destroyed before the next working season. Ground was first broken at the end of 1887, but the first year was occupied in preliminary work, and it was not till the end of 1888 that any attempt was made at work in the river-bed, and not till April, 1890, that the foundations of the great dam were sufficiently advanced to be practically secure against destruction by floods. Even after this date interruptions were frequent, but these became fewer and less important as the dam rose and the regulating capacity of the lake which it formed became greater. Water was poured into the Madura District for the first time in October, 1895, and the dam and works connected therewith were finally completed in the following April. For the passage of the water through the dividing ridge between the valleys of the Periyar and Vaigai, a tunnel had been driven, 5,600ft. in length, with a cross-sectional area of 90sq.ft., and a fall of 1 in 75, the discharge through which might, if necessary, reach 1,800c.ft. per second. The tunnel was approached from the lake formed by the construction of the main dam, by a cutting in solid rock somewhat over one mile in length and 21ft. wide, with a maximum depth of about 40ft. For the passage of surplus water during heavy floods, an escape separate from the main dam had been constructed by cutting down a saddle on the right bank of the river, the stone removed for the formation of this escape being used in the construction of the dam. The sill of this escape was 162ft. above the bed of the river and 31ft. above that of the cutting leading to the watershed tunnel. The top of the parapet of the dam was 16ft. above the sill of the escape, and it was calculated that no flood likely to occur would raise the water-level to more than 11ft. above this sill, for which level (173ft. above the river bed) all the pressures in the dam were calculated. The net result of these operations had been the formation of an artificial lake with an area of 7,454 acres at the level of the sill of the escape, and of 3,765 acres at that of the cutting leading to the watershed tunnel, the lowest level to which it can fall, the greatest depth of water being 162ft. at the former level and 131ft. at the latter. The cubical contents of the lake at escape level were 13,299 millions of cubic feet, the average annual discharge being about 35,000 millions. The water thus stored, after passing through a watershed tunnel, was carried by existing water-courses for a distance of about 80 miles before being distributed for irrigation in the Madura District. The total cost of the works had been about

£500,000, and the net return was expected to be 6·53 per cent. on the capital. The area to be irrigated was about 90,000 acres.

### THE FILTRATION OF WATER.

MAJOR-GENERAL A. DE C. SCOTT, in his monthly Report to the Local Government Board, issued on Wednesday, recites the points to which the Board requested the particular attention of the directors of the London Water Companies in August, 1892, in view of the possible introduction of cholera into this country at that period. The remarks had special reference to the management of the filter beds. General Scott now says;—

"Nothing has occurred in connection with bacteriological investigations carried out since the above-mentioned Report was written which would indicate that the precautions suggested in any respect need modification. Regulations have been issued by the German Government in regard to the filtration of surface waters used for public water supply. In the 15th of the regulations the following occurs: 'Special attention must be given to the upper layer of sand, which must be arranged and continually kept in the condition most favourable for filtration. For this reason it is desirable that, after a filter has been reduced in thickness by scraping, and is about to be refilled, the sand below the surface, so far as it is discoloured, should be removed before bringing on the new sand.' The words italicised by me show that the removal of organic debris from the sand is considered necessary by the department controlled by Dr. Koch. Instructions drawn up three years ago by Professors Frankland and Dewar with reference to the manner in which filtration should be carried out, prescribe, amongst other things, that after a filter has been recharged with water, an interval of rest should follow, during which sedimentation may take place, causing the formation of a skin or layer of slime or mud, which apparently constitutes the most effective portion of the filter from the point of view of bacterial interception. The foregoing observations are necessary because certain portions of a report of the chemist to the London County Council, dated the 30th January, 1896, which has recently been under the consideration of the board, might lead to the conclusion that the generally successful efforts of the officials of the water companies to carry out the work of maintaining the cleanliness of the sand placed from time to time on the filters are misdirected, and, in fact, worse than useless."

Evenley Hall, Brackley, the residence of Mr. William Allen, was destroyed by fire on Saturday. The house, which was one of the largest in the neighbourhood, was formerly occupied by the Hon. Mrs. Pierrepont, and afterwards by Colonel Campbell, and cost £50,000. Mr. Allen bought the house and estate for close upon £40,000 a few years ago.

The supply of properties at the Auction Mart last week was very moderate both in quantity and quality, and the returns showed a correspondingly poor result, the aggregate realisation being only £17,540, as against £32,525 recorded for the corresponding week last year. A feature of the week was the unsuccessful attempt to dispose of the Brailes House Estate in Warwickshire, with 2,514 acres, for which the biddings were not within measurable distance of the sum at which the property was withdrawn: £75,000.

The directors of the Manchester, Sheffield, and Lincolnshire Railway, finding that the proposed new name for the company, the Central Railway, would cause some confusion in the lettering of carriages with the Caledonian and the Cambrian lines, have finally decided to ask Parliament to allow them to celebrate the extension of their system to London by the adoption of the somewhat grandiose title of "Great Central Railway." The proposal was submitted to the shareholders at the half-yearly meeting on Wednesday, and evoked no opposition.

In connection with the alterations at Gloucester Cathedral, Mr. Waller, architect to the Dean and Chapter, who has charge of the restoration of the Lady-chapel, has written to the secretary of the Society of Antiquaries stating that, for sanitary reasons, it has been found absolutely necessary to remove part of the old floor of the chapel in order that the unwholesome soil and the vaults and graves might be filled with concrete. It will, however, be carefully replaced after the necessary work has been done. Mr. Waller emphatically denies that the reredos is being restored, and says that, in fact, it has never been touched since the Commonwealth.

### OBITUARY.

WE regret to announce the death of Mr. DAVID KIRKALDY, the founder and proprietor of the Testing and Experimenting Works, 99, Southwark-street, and for the past twenty years the leading authority on the strength of constructional materials. Mr. Kirkaldy, who was in his 77th year, had been in feeble health for some months past, and died on Monday last at his residence, The Grange, Carleton-road, Tufnel Park, N., as the result of failure of the heart. Mr. Kirkaldy was a native of Dundee, and possessed the shrewdness, caution, and accuracy usually attributed to Scotchmen. He was apprenticed in August, 1843, at the engine works of Mr. Robert Napier, Glasgow. After serving his time in the workshops he was transferred to the drawing office, where he rapidly rose to be chief draughtsman. He took up the subject of the trial-trip performances of steamships, and thereby rendered important services to his firm; but his work in this department was discontinued after a time, to his great disappointment, owing to a prejudice against his advanced ideas. He employed his leisure in making water-colour drawings, partly in section, of various vessels. A drawing which he made of the famous steamship *Persia* was exhibited at the Royal Academy. In 1858 Mr. Kirkaldy first began testing materials. He also turned his attention to the oil-hardening of steel, and was the first to patent a process for this purpose in 1859. He left the firm of Napier in 1861. After several years' study he perfected the design of a testing machine, which he patented, and which was erected in Southwark. This machine is remarkable as having been constructed in exact accordance with the drawings which accompany Mr. Kirkaldy's patent specification—a very rare occurrence. It covers an area of about 54ft. by 26ft., and the four main screws measure each 36ft. in length, and are 5½in. in diameter. In January, 1874, Mr. Kirkaldy took new premises in Southwark-street, in which he established a museum containing specimens showing the results of all kinds of tests of every variety of material. The funeral takes place to-day (Friday) at Highgate Cemetery at 12.30 p.m.

### CHIPS.

News was received at Salisbury on Wednesday from the War Office that the Government had purchased 40,000 acres for military purposes on Salisbury Plain.

Building operations are proceeding rapidly upon the Foleshill-park estate, near Coventry, where, under the direction of Messrs. Harrison and Hattrell, architects, Hertford-street, Coventry, houses for the accommodation of artisans are being erected. This part of Foleshill is gradually losing its rural, and assuming an urban, character.

At a special meeting of the proprietors of the Highland Railway Company, held on Wednesday, it was resolved to apply to Parliament for power to double about 76 miles of line from Inverness to Perth, and other extension works, estimated not to exceed, with interest, £174,750; and also to ask powers to construct a new line from Inverness to Fort Augustus, a distance of 31 miles. For the latter scheme the capital proposed is £400,000, with further powers to borrow to the extent of two-thirds.

In the Court of Appeal on Wednesday, before Lords Justices Lindley, A. L. Smith, and Rigby, an appeal was heard of Messrs. Waddell, the contractors for the construction of the Mersey Railway, against an order of Mr. Justice Stirling directing that sums amounting to £25,746, Parliamentary deposits to the credit of the undertakings of the company, should be applicable in the first place towards payment of arrears of interest to the debenture-holders of the company. The deposits had been assigned to the contractors, subject to all claims properly payable therefrom. Their lordships held that the assignment did not deprive the debenture-holders of their rights, and dismissed the appeal.

Detailed estimates have been deposited in Parliament by the engineers to the Bute Docks Company, showing the expenditure of capital which will be required by that company in the event of its Bill of this Session being sanctioned in its present form. The total estimated expenditure is put down at £410,503, of which £311,177 will be required to construct over 12½ miles of railway so as to give the docks independent railway access to the Taff and Rhondda valleys and other portions of the Glamorganshire coalfield. The balance will be mainly expended in the construction of a low-water pier at a cost of £68,200, and in diverting the river Taff at a cost of £29,700, so as to prevent mud passing from the river into the entrance channel to the docks.



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## ILLUSTRATIONS.

THE COURT OF THE LIONS AT THE ALHAMBRA.—MAR LODGE, DEESIDE, ABERDEENSHIRE.—NEW HOTEL AT DUNBAR.—NEW OFFICES FOR THE NEWCASTLE AND GATESHEAD WATER COMPANY.—WORKS OF ART AT SOUTH KENSINGTON.—HOYLAKES AND WEST KIRBY DISTRICT COUNCIL OFFICES.—ARMOUR AND ARMS FROM THE ZSCHILLE COLLECTION.—HAMMERED IRON CHOIR SCREEN IN BEVERLEY MINSTER.

## Our Illustrations.

## EL PATIO DE LOS LEONES, ALHAMBRA.

This charming drawing of the famous Court of the Lions at the Alhambra was made by Mrs. Harriet Ford in 1832, and we are indebted for its loan to the Right Hon. Sir Clare Ford, G.C.B., the English Ambassador in Rome. In our issue for the 1st inst. we published another drawing by the same hand when giving some sketches by Mr. Joseph Pennell, also in illustration of the Alhambra. These drawings by Mrs. Ford were shown last spring at the Spanish Exhibition. The Court of the Lions, so called because of the beautiful fountain, supported by twelve conventional-looking animals radiating on all sides, measures 115ft. by 66ft. from wall to wall. The apartments surrounding the Court are very delightful, and the whole composition forms the most beautiful and most perfect example of Arabian art in Spain, of which, indeed, it is the gem. It is constructed of wood, covered with stucco, elaborately enriched, and decorated in gold and colour. The late Owen Jones's copy of this Court, erected at the Crystal Palace in 1854, deserves mention, as it is identical in detail with the original, excepting that in plan it is somewhat curtailed in extent.

## MAR LODGE, DEE SIDE, ABERDEENSHIRE.

This new Highland residence has been recently built for the Duke of Fife, whose house in Mar Forest was destroyed by fire in 1895. The walls of the house are built of a light coral granite found on the estate. The timber is also native, being of Scotch fir from the forest of Mar. The upper parts of the gables are of half-timber construction, the spaces between the timbers being plastered, and harled with an outer coating of crushed quartz from the Cairngorm Mountains. The roofs of the building are covered with English-made red tiles. Electricity is to be used for lighting, as well as warming the interior. In the centre of the building is a hall and grand staircase. By these access is obtained to the public rooms, including a large dining-room and a smaller dining-room. There is a spacious drawing-room, a large billiard-room, and 26 bedrooms, and also bedroom accommodation for 25 men-servants and 40 maid-servants. The stabling accommodation consists of 36 stalls, with two harness-rooms attached, two carriage-houses, and mess-room and scullery. The architect is Mr. A. Marshall Mackenzie, of Aberdeen. The fire-proof flooring is to be on the Stuart granolithic system, carried out by Stuart's Granolithic Pavement Co., Limited, of Regent's Dock, Limehouse,

London. The main steel girders are from 10ft. to 13ft. 5in. apart, and span from wall to wall. On their lower flanges rest the granolithic fire-proof ceilings. These latter span intervals of 18ft. by 13ft. 5in., and are only 4in. in thickness. They will carry a load of 5cw. per square foot. The steel girders are to be incased with granolithic, which is to be turned up 8in. along the walls, thereby making the ceilings perfectly watertight. In the case of a fire, should water be turned on, it will stand to the depth of 8in. all over the floors. Thus there will be complete isolation between the floors, and it will be rendered impossible for fire to reach from the ground floor to the upper floor, or *vice versa*. The system is the invention of Mr. P. Stuart, F.R.S.A., whose family were the builders of Balmoral Castle.

## HOTEL AT DUNBAR, N.B.

THE design illustrated by our double-page plate shows the arrangement of an hotel in course of completion at Dunbar, Haddingtonshire, N.B., Dunbar having recently come into favour as a spring and summer resort. The building is an adaptation of the Scotch Baronial style. The exterior walls are rough-cast, and the oriels and central feature built in red stone from Corncockle Quarry, Dumfriesshire, while the roof is covered with sea-green slates from Tilberthwaite, with red ridge tiling. The entrance-hall, corridors, staircase, and billiard-room are heated by hot-water pipes, with radiators placed at convenient points. It is intended that the hotel will be ready for occupancy at Easter. The total cost will be about £12,000. Messrs. Dunn and Findlay, Edinburgh, are the architects.

## NEW OFFICES OF THE NEWCASTLE AND GATESHEAD WATER COMPANY, NEWCASTLE-ON-TYNE.

THE architects of these offices are Messrs. R. Knill Freeman and S. Denison Robins, and their design, which we illustrate to-day, was chosen in a limited competition some time since by Mr. T. E. Colclutt, who was engaged as professional referee. In execution the work has been somewhat improved, we understand, upon the original competition façade. The site is a prominent one, and the building a return front, the whole being faced with stone work.

## WORKS OF ART, SOUTH KENSINGTON MUSEUM: WROUGHT-IRON GRILLES.

THIS sheet comprises some of the best wrought-iron grille work located in the South Kensington Museum, and the pieces thus illustrated were chosen for our pages for this reason by the late Dr. J. H. Middleton, the Art Director. The periods of the several examples here shown are given on the plate, and also their nationality and scale. What is of more consequence to the architect and designer is, after all, their character and suggestive applicability for modern uses as types of treatment adaptable for everyday requirements. Each specimen is admirably contrived and spaced, so that the foliage occupies the field which the ornament has to fill without ugly voids or loss of structural strength and stability. The German Renaissance arched grilles are particularly happy designs, late in style, but dating before the decadence of the "Baroque" period. Their leading lines harmonise well with the spandrel form of the entire panel in each case. The threaded German work in the right-hand tall panel with the arched head speaks for itself, and the Italian grille is very charming.

## HOYLAKES AND WEST KIRBY DISTRICT COUNCIL OFFICES.

THESE buildings are about to be erected on a site at the junction of Market-street with Albert-road, Hoylake, from the designs of Mr. Thomas W. Cubbon, architect, of Birkenhead, who obtained first premium in open competition. The entrance to public offices is from Market-street, to the right of which the town clerk's and medical officer's departments and council chamber are arranged, the surveyor's and rate-collector's departments being to the left; the fire-station fronts Albert-road, and consists of engine-house, assembly-room, and large yard. The remaining portion of ground floor is arranged for technical classes, &c. The first floor consists mainly of large public hall, capable of accommodating about 500 people, three entrances being provided, one from Market-street and two from Albert-road. Ladies' and gentlemen's dressing-rooms and large refreshment-room are arranged in connection with hall. The caretaker's house is over the fire-station, and is approached from Albert-road.

The buildings will be faced with red Ruabon bricks, with dressings of Runcorn stone and terracotta. The fire-station and technical block have been carried out by Messrs. Hill and Co., of Woolton, Liverpool, and a tender for public offices and hall, submitted by Mr. W. H. Forde, of Birkenhead, has been accepted. The total cost of buildings will be about £5,000, exclusive of land and furniture.

## SKETCHES FROM THE ZSCHILLE COLLECTION OF ARMOUR AND ARMS, ETC.

THIS large and exceptionally fine collection, belonging to Herr Richard Zschille, of Grossenhain, and numbering between 800 and 900 objects, was exhibited at the Chicago Exhibition in 1894, and is now being dispersed at the sale rooms of Messrs. Christie, Manson, and Woods. The auction commenced last Monday, and has been continued during the days of this week, and will be terminated next Monday. The Casque, which occupies a prominent position on the sheet of sketches in our present issue, is of classical form with high comb. The incident represented on the left-hand side of the skull (as shown) is that in which Mucius Scaevola thrusts his hand in the flames before King Porsenna; on the other side, the leap of Curtius into the abyss is represented. Allegorical figures of Strength and Wisdom and military trophies decorate the comb. The work is embossed in russet iron and finely damascened in gold. It belongs to the latter half of the 16th century. The sum for which this grand head-piece was knocked down at the conclusion of Wednesday's sale was £300. The suit of Demi-armour, consisting of breast-plate, gussets and turnover, taces, back-plate, turners, rere and vambraces, coudres, tassets, and cabasset, is richly engraved and gilt with vertical bands, with trophies of armour and Romanesque figures. The highest bid for this suit was £105, at which sum the hammer fell. The Saddle is composed of polished deer-horn plates, with high pommel, the cantle being formed of two circular plates. On either side of pommel are two slightly-carved figures in drapery and there are two slits through which to pass the girths. There are similar saddles at Hertford House and the Tower. Though rudely made, there is much grace and beauty in the contour; it is lined with birch bark, and is attributed to Burgundian workmanship about 1400. This very rare saddle was sold on the first day for £480. The Rapier shown in the left-hand bottom corner has a spirally-fluted grip of gold and silver wire, terminating in a large pommel with four panels, decorated in relief, with warriors, gladiators, &c. The knuckle-guard and quillons and bars have oval, four-sided lobes, with figures in relief. The whole of the ground-work of this fine rapier is minutely damascened with scroll-work in gold; the blade is 44½in. long, four-sided, grooved, and contains the armourer's mark on the ricasso. The original scabbard accompanies this 16th-century work of the armourer, and the chape, like the hilt, is damascened. The beauty and quality of this Rapier made it the subject of keen competition, and it was eventually sold for £370. The Rapier included in to-day's sale, in top corner, has a hilt of russet steel with wire grip; the pommel, knuckle-guard, and quillons are chiselled throughout in relief with equestrian encounters. The blade is 41in. long, four-sided, and trebly fluted, and inscribed with the names of the twelve Apostles. The armourer's mark, a mounted warrior, inlaid in gold, is on the ricasso. Both rapiers are Italian. The Morion, also from Italy, is faceted, and terminates in a strong point; it is decorated with two panels of engraved work, with foliage, griffins, and flowers, gilt on a blued ground; its date is about 1560. This Morion is down for sale next Monday.

Lord Herschell opened, on Wednesday, a new Technical Institute at Swindon, built at a cost of £12,000.

The Workmen's Club and Institute, in Nelson-road, Chatham, was burned to the ground on Tuesday morning, and the library, consisting of over 1,000 volumes, billiard tables, and a large quantity of furniture were destroyed.

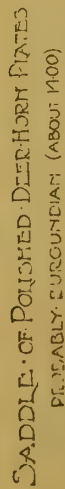
The Bierley Small-Pox Hospital for the county borough of Bradford is being warmed and ventilated by means of Shorland's patent Manchester stoves and Shorland's patent exhaust roof ventilators and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.



SKETCHES FROM THE ZSCHILLE COLLECTION.  
OF ARMOUR & ARMS. ON SALE AT CHRISTIE'S



ITALIAN MORION. (ABOUT 1560)



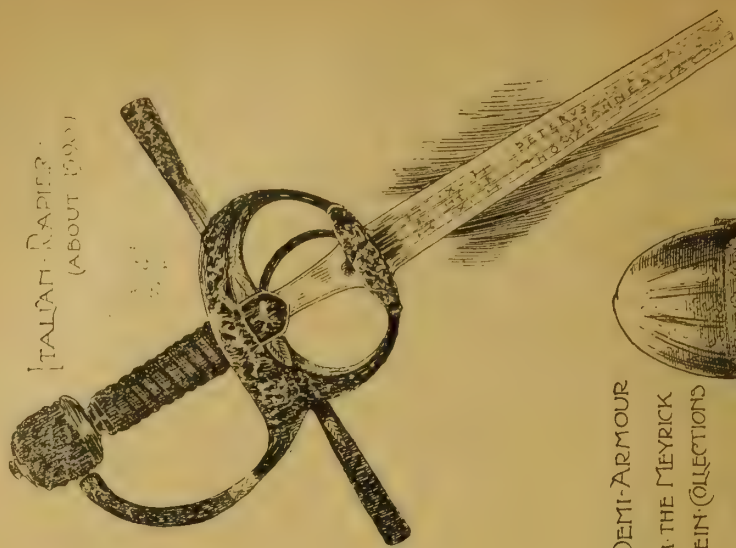
SADDLE OF POLISHED DEERHORN PLATES  
PROBABLY BURGUNDIAN (ABOUT 1100)



ASQUE  
EMBOSSED &  
DAMASCENED  
(LATTER HALF-16<sup>TH</sup> (EN<sup>D</sup>))



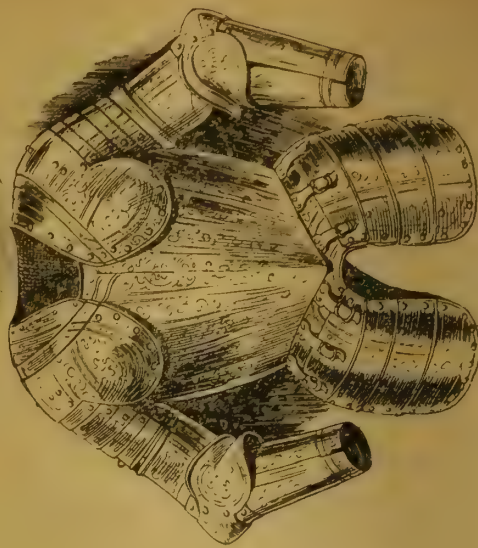
ITALIAN - RAPIER  
ABOUT 1560.



ITALIAN CAPERS.  
(ABOUT 1500)



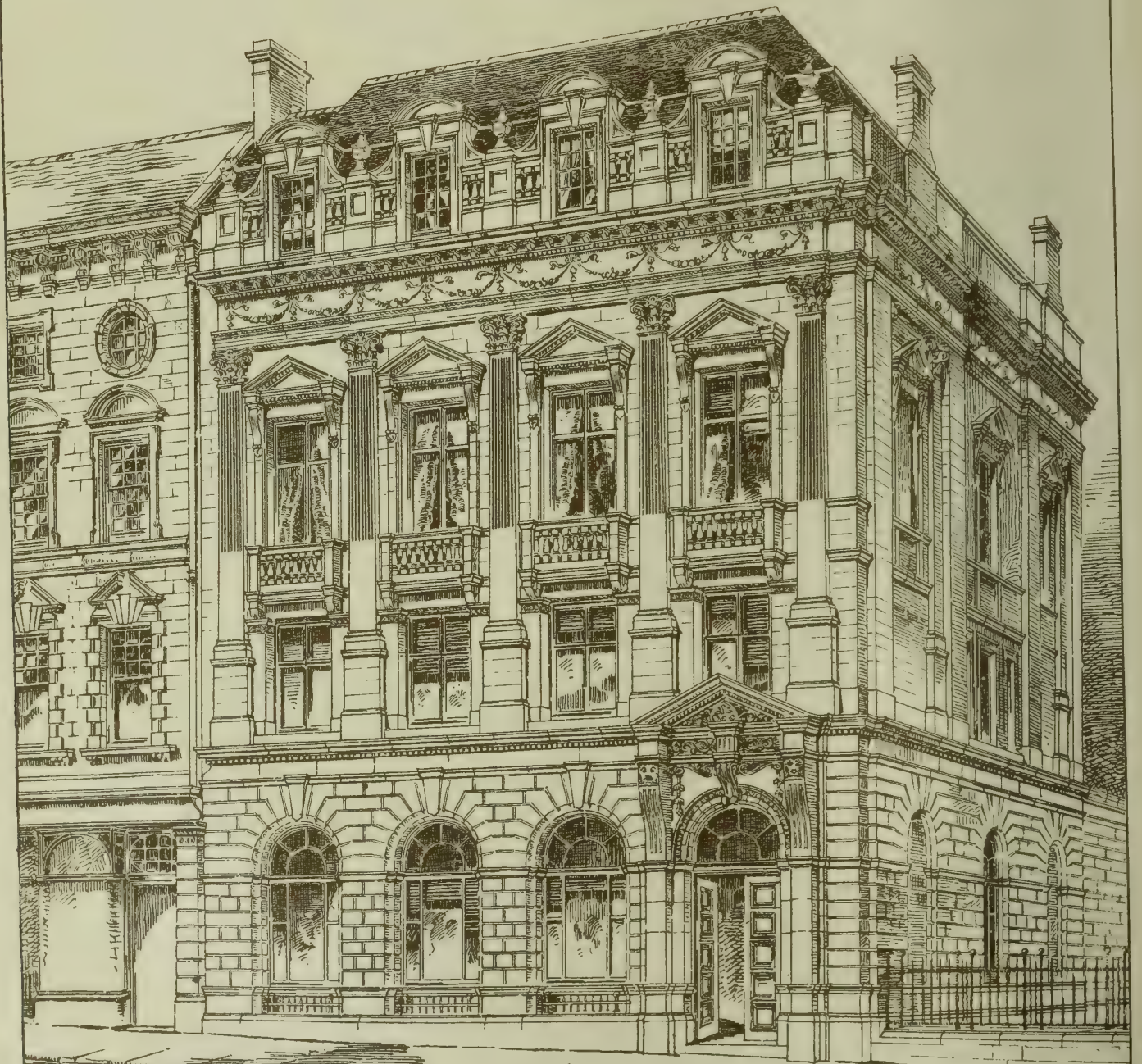
SUITS OF DEMI-ARMOUR  
FROM THE MEYRICK  
STEIN COLLECTION









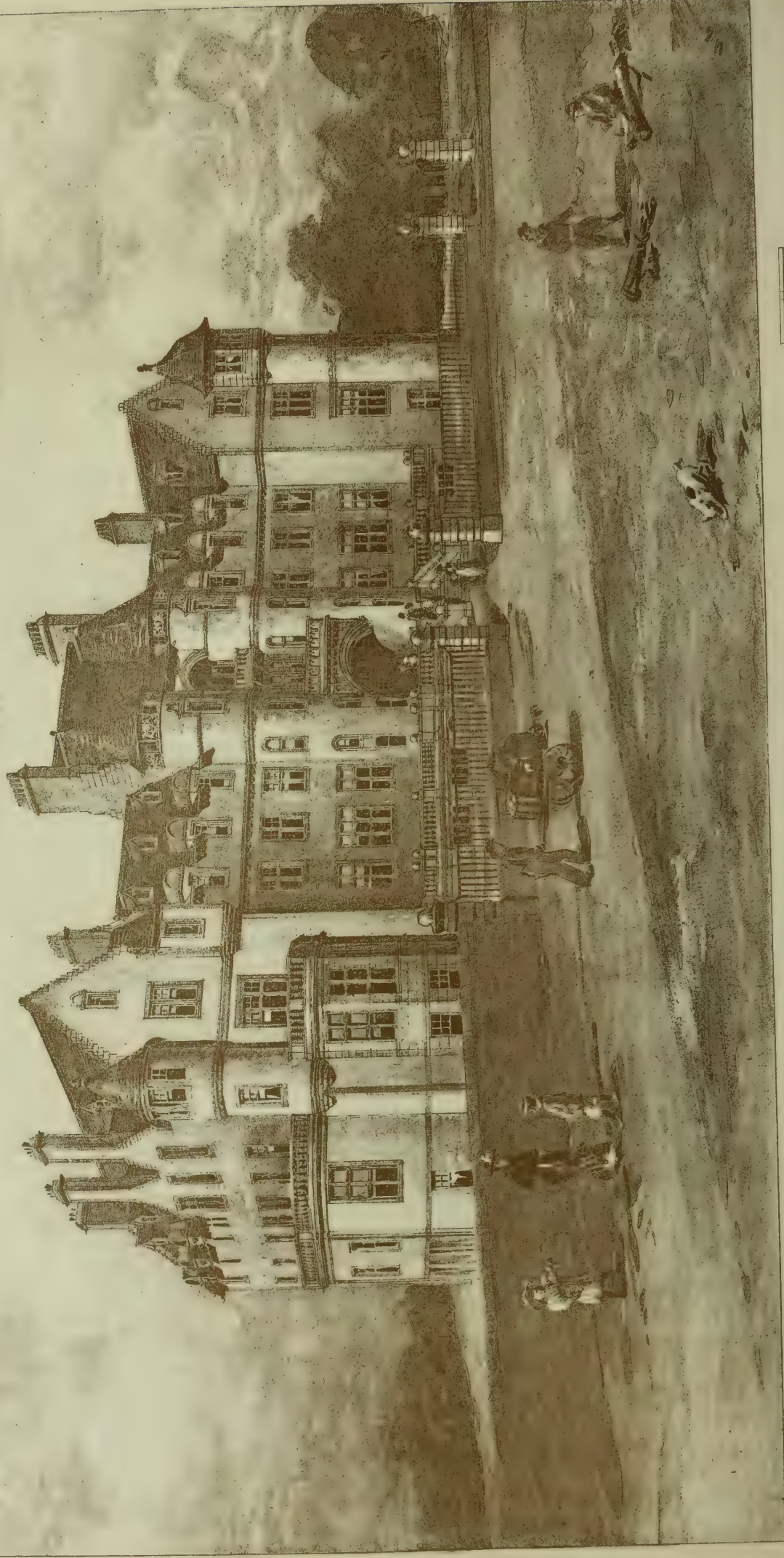


NEW OFFICES FOR THE NEWCASTLE AND GATESHEAD WATER COMPANY.  
NEWCASTLE-UPON-TYNE.  
R. KNILL, FREEMAN, F.R.I.B.A. & S. DENISON, ROBINS.  
ARCHITECTS, NEWCASTLE-UPON-TYNE.

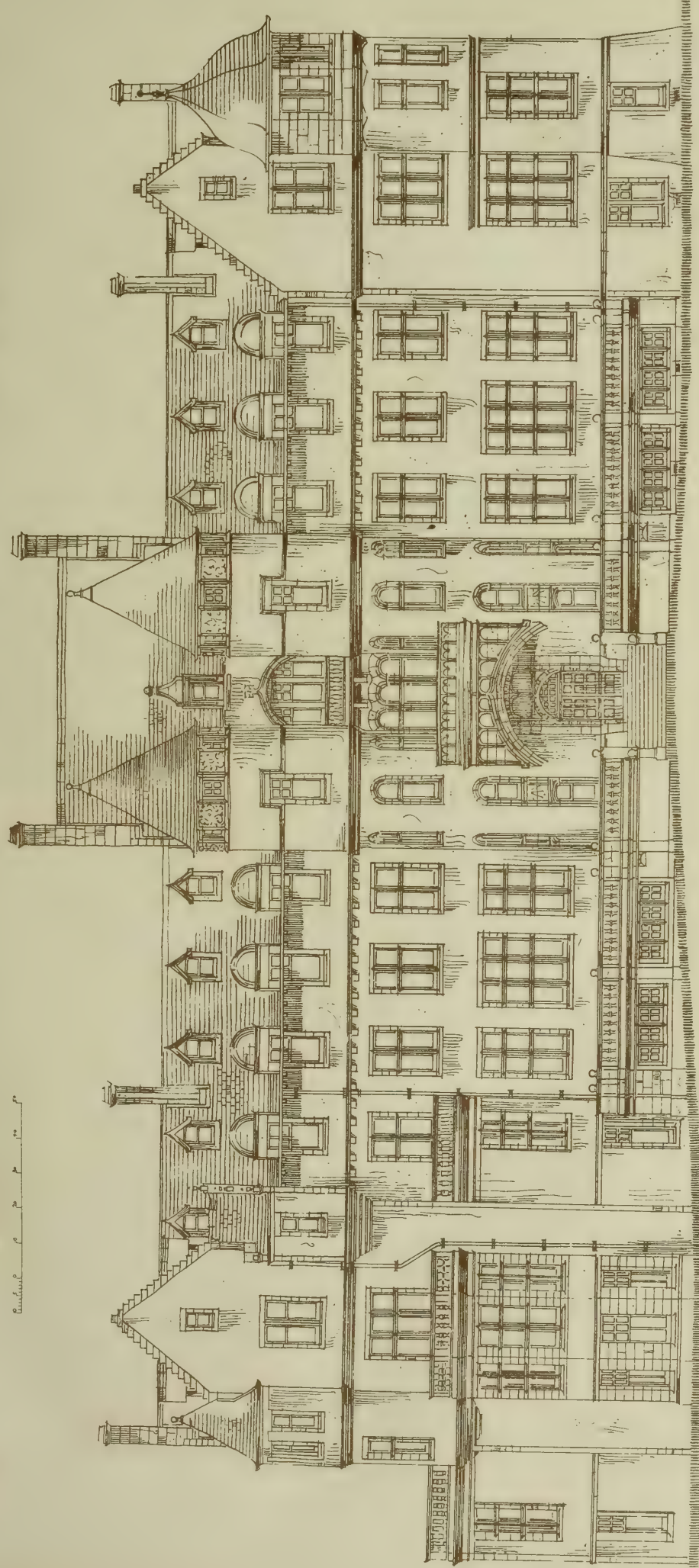
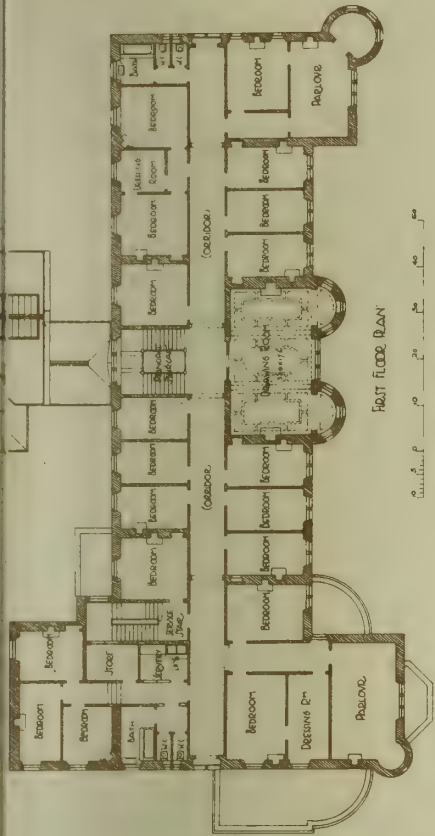
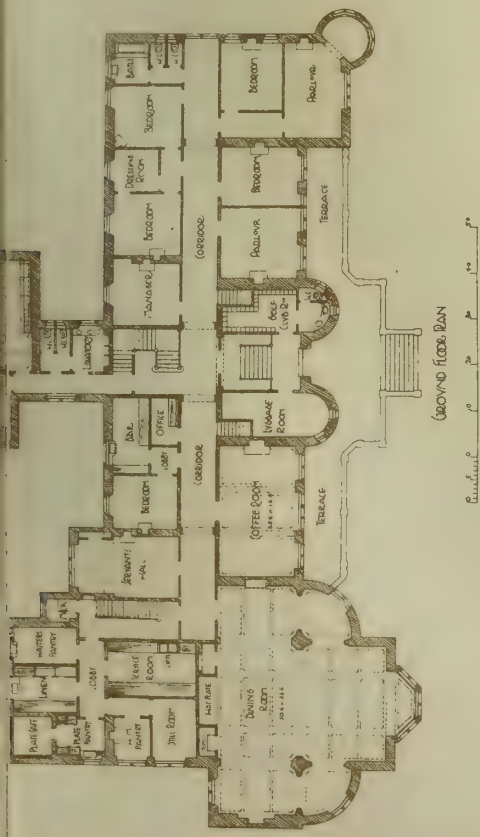












FRONT ELEVATION:



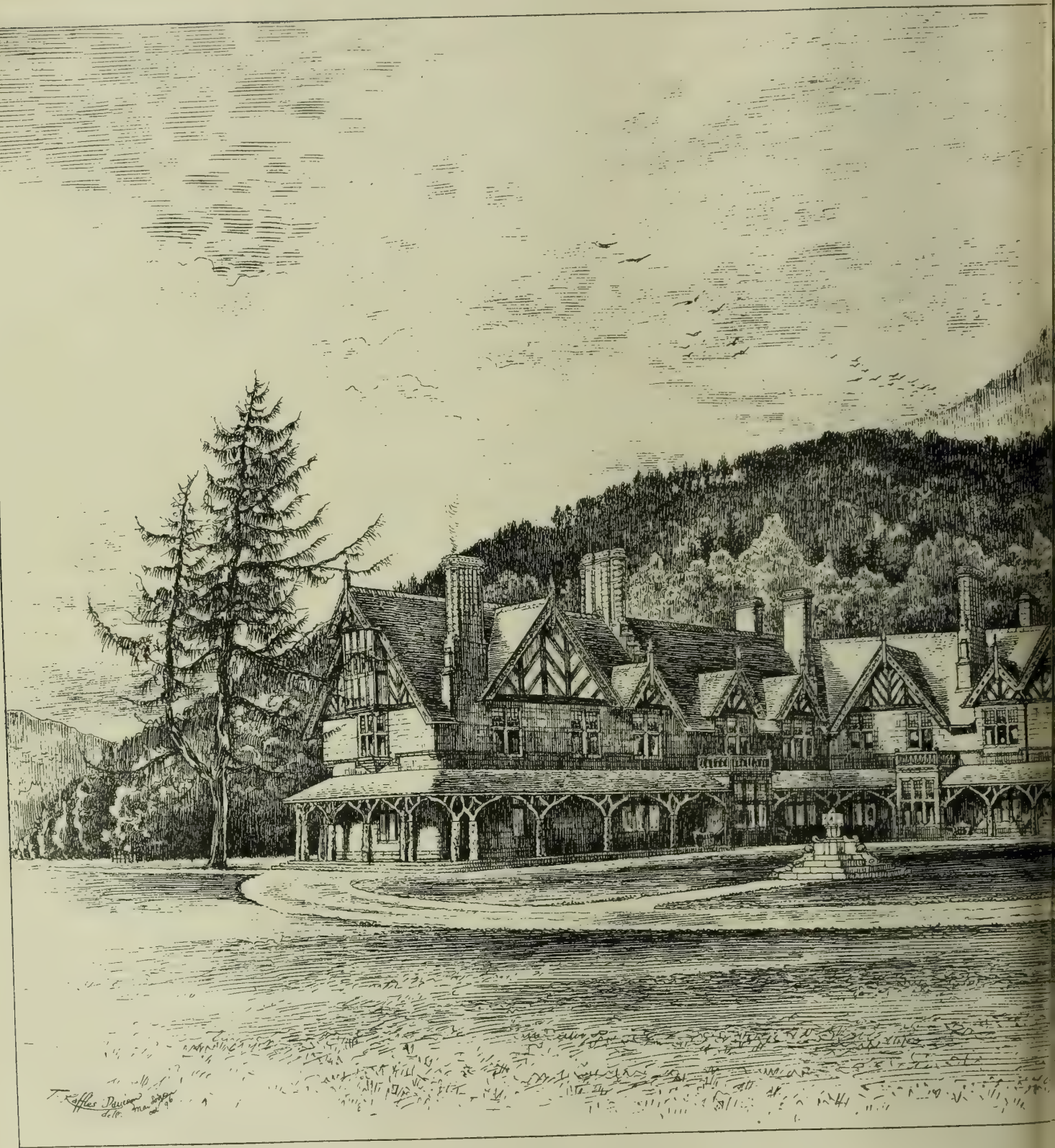












MAR LODGE. DEESIDE, ABERDEENSHIRE

A. MARSHALL MACKENZIE, A.R.



JAN. 29, 1897.

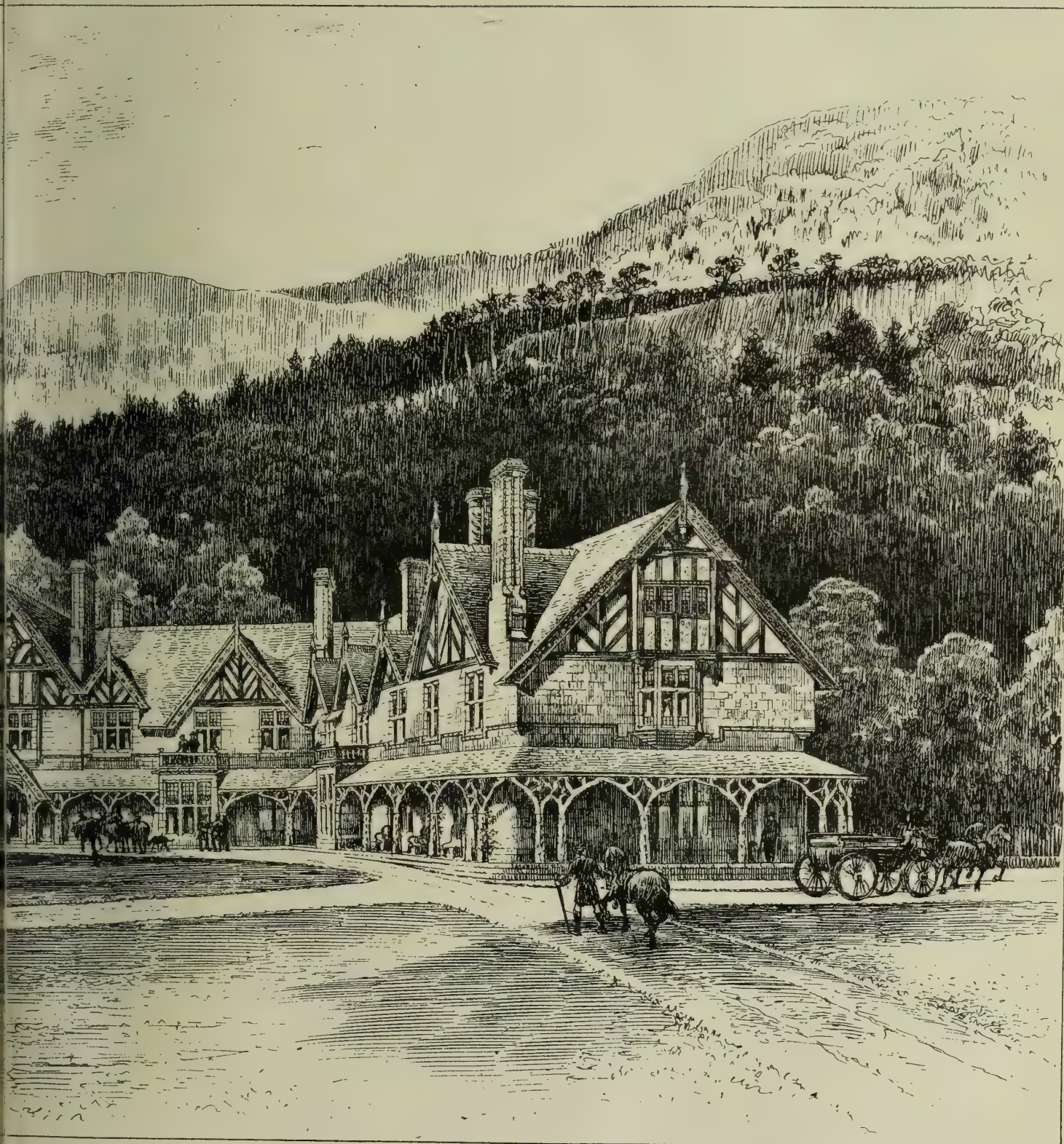
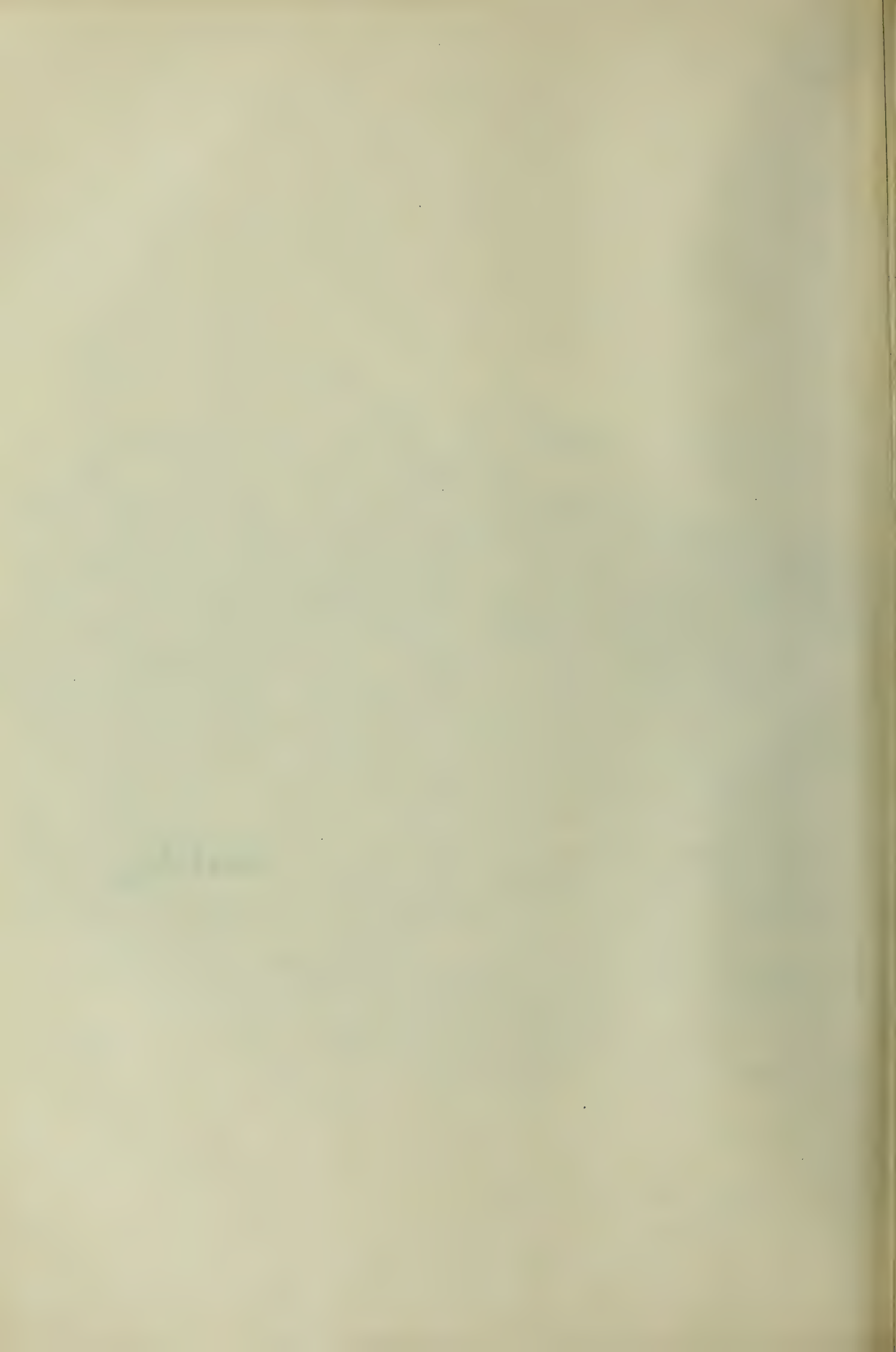


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

FOR HIS GRACE THE DUKE OF FIFE, K.T.  
R.I.B.A., ARCHITECT, ABERDEEN.

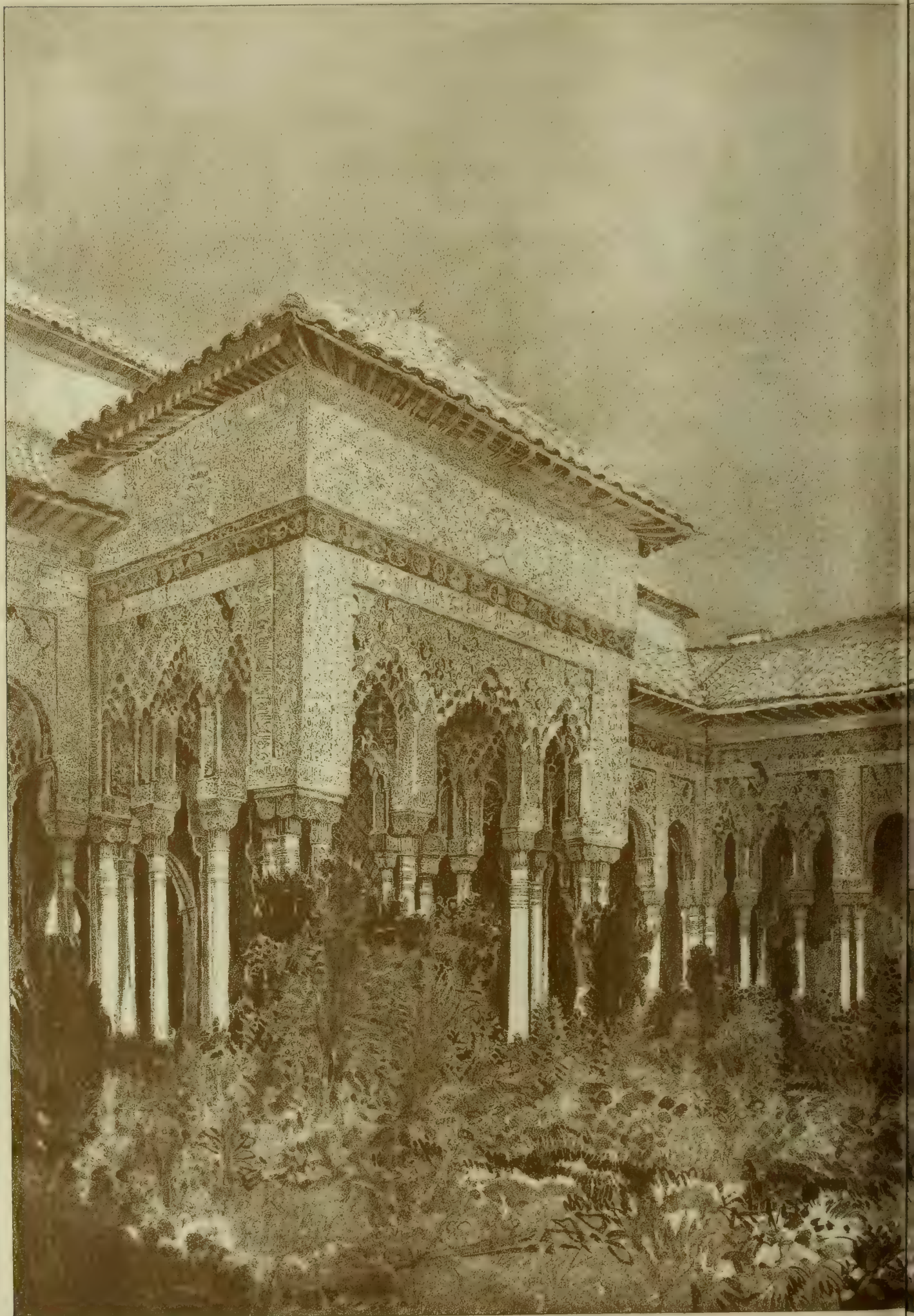












EL PATIO DE LOS LEONES · ALHAMBRA · BY HARRISON



JAN. 29, 1897.



"PHOTO-TINT", by James Akerman 6, Queen Square London W.C.

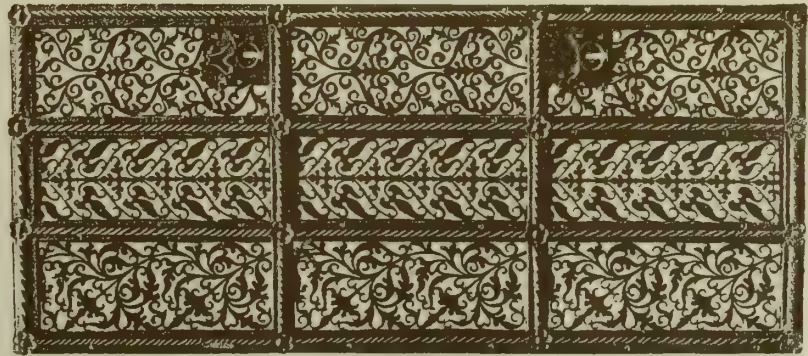
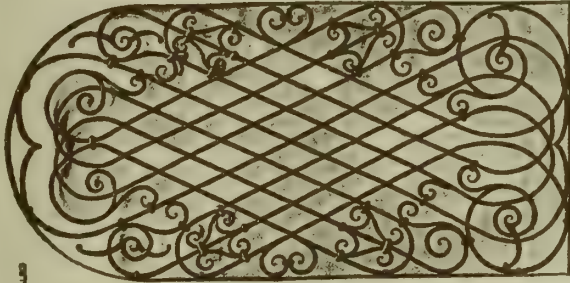




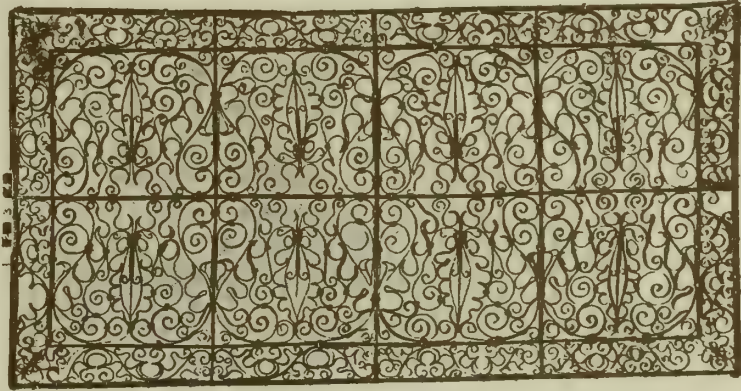




WROUGHT-IRON GRILLES - GERMAN WORK - OF THE 17<sup>TH</sup> CENTURY.



WROUGHT-IRON DOOR FROM CHENT. 16<sup>TH</sup> CENTURY. FLEMISH WORK.

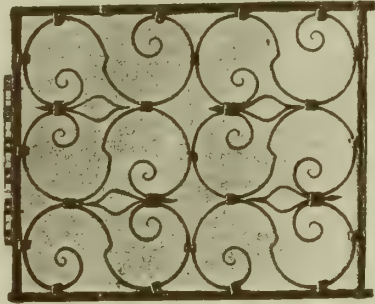


WROUGHT-IRON PANEL OF OPEN WORK - ITALIAN

IN THE STYLE OF THE 16<sup>TH</sup> CENTURY.



ITALIAN GRILLE OF THE 17<sup>TH</sup> CENTURY.



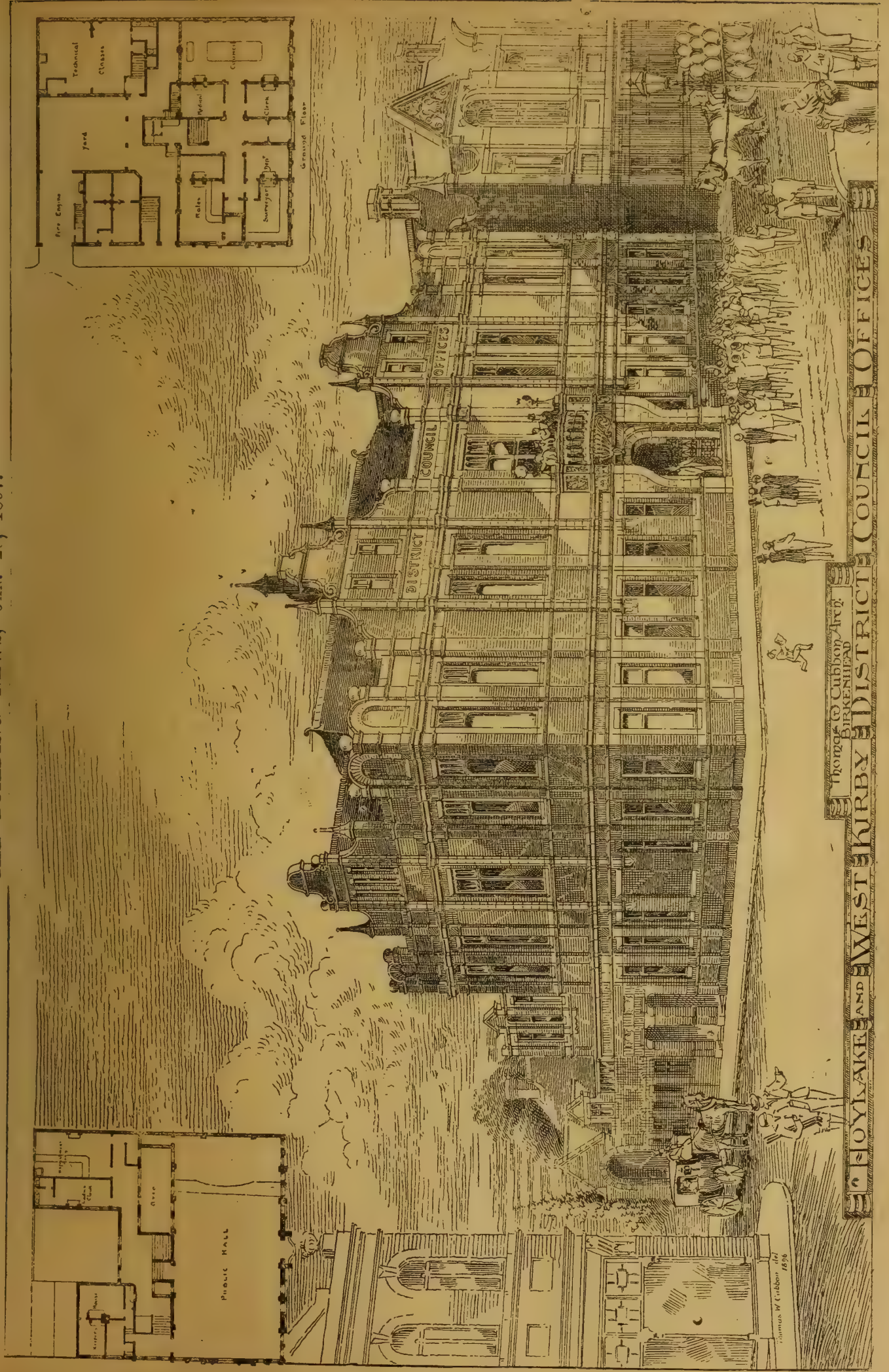
12 INCHES

Photo-Tint by James Akerman 6 Queen Square London W.C.









THOMAS W. CUBBON ARCHT. BIRKENHEAD



## THE PRACTICE OF COMPENSATIONS.

MR. J. F. FIELD presided on Tuesday night at a meeting of the Auctioneers' Institute of the United Kingdom, held in the Lecture Hall, Chancery-lane. Professor Banister Fletcher, J.P., F.R.I.B.A., read a paper on "The Practice of Compensations." He dealt with the mistakes which were sometimes made, and which appeared to be firmly fixed in the minds of some practitioners. Dealing first with the deduction of ground-rent, he remarked that some surveyors could not appreciate that it mattered not what the character of the outgoings was, but seemed to think that ground-rent should be capitalised in making a valuation. The fallacy of this method might be shown by asking the question, "If the ground-rent is to be capitalised, why should not the rates, taxes, and other outgoings, or as they are sometimes called, leakages?" Did it not appear to be the commonsense view that the income derived, after all deductions, was the income to be capitalised? It surely did not matter whether the income was from property, from Consols, railways, debentures, or from whatever source the nature of the investment might be—absolutely the net income must form the basis of valuation. He desired to refer to a second error—namely, the putting by of income as a sinking fund at a different rate of interest to that which the property yielded. It was clear that if a man held a lease, and desired to put by money year by year to accumulate, so that he might have the same capital as when he purchased the leasehold property, he could only invest such small sums safely at a lower rate of interest, and to this extent the two rates of interest applied. In compensations, however, there could only surely be one table. The income had to be sold, and the market valuation varied according to the value of the security. Yet income alone should be the basis of valuations. Probably the most difficult portion of the practice of compensation was when only a part of an estate or property was taken, and there could then be a valuation claim for severance. Witnesses often differed much in their estimate of injury. He thought the fairest way was to prepare plans for laying out the estate—if it were land that was affected—one plan as originally intended to be laid out, and another showing the laying-out after the railway or other company had taken a portion. The difference of the estimated incomes should be the yearly loss. This, multiplied by the years' purchase, with the 10 per cent. added, would give the claim. Professor Fletcher concluded with a reference to professional etiquette. It was important that there should be a well-recognised system that no profession could hope to attain a high standing, and, therefore, a recognised public position, which was negligent of, or refused to be guided by, gentlemanly rules of conduct. He was told that one of the leading Boards in London required its surveyor to interview tenants and lessees who had made claims against that Board, and after they had placed the claims in the hands of their surveyor, by threats of the costs of an action, and that the Board would not pay any surveyors, had induced them to settle. Again, the Board's surveyor would not serve notice to treat, but endeavoured to force the freeholder, lessee, tenant, or their surveyors to come to terms without; and if at last he could not arrive at a price he wanted to purchase at, he would try and buy some other property, thus putting people to much unnecessary trouble and expense. It might fairly be asked whether the Board should impose such unprofessional work on its paid officer. A vote of thanks to Professor Fletcher was moved by Mr. D. L. Gooch, and adopted. A discussion on the paper followed.

Mr. C. Garlick, builder, of Coventry, has just commenced the erection of a large three-story factory for the Auto-Machinery Company, in Read-street, in that city. The building, which is located between the company's present works and those of the Humber Co., is to be finished by the beginning of May. Mr. A. E. Faulks, of Loughborough, is the architect.

The disasters occasioned by Friday's storm include the cutting in twain by a derelict brigantine of the iron pier at Redcar, on the North Riding coast. Only fifteen years ago a similar accident occurred to the same pier.

The Charles Lamb and John Keates Memorial Library, erecting at Edmonton from the designs of Mr. Maurice B. Adams at the expense of Mr. J. Passmore Edwards, is being built by Mr. Arthur Porter, of Tottenham. The foundation-stone ceremony is shortly to take place.

The rural district council of Doncaster decided, on Tuesday, to request the surveyor, Mr. Wood, to send in his resignation on account of advancing years. Mr. Wood, on being informed of the resolution, said he should not tender his resignation, whereupon a member stated that at the next meeting he should move that Mr. Wood be given three months' notice.

## COMPETITIONS.

BOOTLE SCHOOL BOARD.—A design has been selected out of a number of competitive plans sent in to the Bootle School Board for the new school proposed to be erected in Gray-street to meet the want of accommodation for the children of the borough. Competitive plans were advertised for, and fifteen sets were received, and in arriving at a conclusion as to the best design furnished, the members of the board have had the assistance of Mr. Paul Ogden, of Manchester. After careful consideration, the building and finance committee selected as the most suitable the plan and estimate of Messrs. Cox and Marmon. A special meeting of the Bootle School Board was held at the offices, Balliol-road, on Wednesday week, for the purpose of adopting the plan for the erection of the proposed school. The following recommendation of the building and finance committee was brought forward by Mr. Smith for adoption:—"That, subject to the consent of the Education Department and to a contract being entered into by the architects for the carrying out of the scheme in accordance with the conditions enumerated in the memorandum issued to competitive architects, the plan for the Gray-street school sent in under the *nom de plume* 'Left-hand Light' be adopted, and that the architects whose the *nom de plume* is, be, and they are hereby appointed, architects for the school upon the usual conditions." In moving the foregoing, Mr. Smith said the committee wished to express their thanks to the competitors, who, by the careful thought and ability brought to bear on the preparation of the plans sent in, had made the committee's labour of deciding no easy matter. The board, in a memorandum issued to competitors, very fully laid down the general lines to be observed, and made special mention of the necessity for economy being observed. The committee had endeavoured, in coming to their decision, to give the fullest consideration to the plans, and had held no fewer than five meetings, lasting over a considerable time, in addition to the individual time given by members to the study of the several plans. It might also be mentioned that between the highest and lowest estimates of the cost as given by the competing architects there was a difference of £5,000. Mr. Francis Wilson seconded the adoption of the recommendation, which was carried unanimously. The letter bearing the motto "Left-hand Light" was then opened by the chairman, and it was found that the set of plans selected were those of Messrs. Cox and Marmon, architects, of Liverpool and Bootle. The cost of the new school, which will accommodate about 1,100 children, is estimated to be £7,297. The cost of the new school will be considerably less than that of the board's other schools.

DOUGLAS, ISLE OF MAN.—In an open competition instituted by the town council for their new cemetery buildings, &c., the designs sent in by Messrs. Huon A. Matear, F.R.I.B.A., and C. Sydney Ingham, of Liverpool, Manchester, and Southport, have been awarded the first premium; while the second one has gone to Messrs. Kay and Clucas, of Eastfield.

The Archbishop of Canterbury will unveil the bust of Dr. Arnold, by Mr. Alfred Gilbert, R.A., at Rugby, on Monday, Feb. 8, at 5.0 p.m.

The Castle Ward Rural District Council have adopted the scheme of main sewerage and sewage disposal for Stamfordham and Hawkwell prepared by Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, and which will prevent the pollution of the River Pont, complained of by the county council.

At the half-yearly meeting of the Great Eastern Railway Company, held on Tuesday, the chairman stated that the directors had inquired of their station-masters on the suburban lines between Stratford and Hackney Downs the number of houses built recently in those respective districts, and they are upwards of 6,509, while 3,274 are now in course of construction.

The Home for Women, built at the cost of Mr. Passmore Edwards at Chalfont St. Peter's, Bucks, for the colony worked by the National Society for the Employment of Epileptics, is to be opened in March. Mr. E. C. Shearman is the architect. The Home for Men, now building on the same estate, is from the designs of Mr. Maurice B. Adams, F.R.I.B.A., who is also the architect for the Boys' and Girls' Homes, about to be commenced, and carried out with funds provided by Mr. Edwards. Mr. Darlington, of Caversham, is the builder of the work in hand.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.—The eighteenth annual report of the council of this society to be submitted at the annual meeting to be held at the Chapter House to-morrow (Saturday) afternoon, congratulates the members upon the continued prosperity of the society. During the year seven evening meetings have been held, at which the following papers have been read:—"Foreign Incised Slabs," by the Rev. W. F. Greeny; "St. Alban's Day and St. Mary Magdalene's Day," by Lord Aldenham; "St. Cyprian's Day," by Dr. J. Wickham Legg; "Photographic Notes on some Norfolk Churches," by the Rev. Walter Marshall; "The Sherborne Mass-book considered in its Relations with the Sarum and other English Books," by Dr. J. Wickham Legg; "The Hanging Pyx," by Mr. H. J. Feasey; "Ecclesiastical Habit," by the Rev. T. A. Lacey; and "A Visit to some of the Cathedrals of Northern and Central Italy, especially those of Florence and Orvieto," by Mr. Joseph Grimshire. Afternoon visits were made to St. Paul's Cathedral, under the guidance of the Rev. Lewis Gilbertson, and to the parish churches of St. Michael, Camden Town; St. Augustine, Highgate; St. Bartholomew, Smithfield; The Holy Redeemer, Clerkenwell; St. Giles and All Saints, Orsett; and St. Peter and St. Paul, Lingfield. A whole-day excursion was made to Ely Cathedral. This was the second visit of the Society to Ely, the first having been made in 1886. The balance sheet shows a satisfactory surplus; but this is the result of exceptional circumstances.

N.A.A. STUDENTS' SKETCHING CLUB.—The seventh annual social gathering of the Students' Sketching Club, in connection with the Northern Architectural Association, was held on Tuesday night, at the Grand Assembly Rooms, Barras Bridge, Newcastle. There was a large gathering of members and their friends. In the unavoidable absence of the president (Mr. Archibald M. Dunn), Mr. Joseph Oswald, the ex-president, took the chair, and presented the certificates of the Association to the students who had been successful in the competitions as follows:—Measured drawings: S. M. Mould, 1; B. Proctor, 2. Sketches: H. Raine, 1; S. M. Mould, 2. The members of the committee were Messrs. C. S. Errington, W. W. Oliver, J. White, S. M. Mould, C. F. Newcombe, and J. L. Nicholson with Mr. R. P. S. Twizell as hon. secretary. A very enjoyable programme was provided during the evening by Mr. Stephen Piper, Mr. J. R. Hedley, Mr. B. R. Chicken, Mr. B. F. Mulcaster, and Mr. J. Davidson, and by an orchestra conducted by Mr. Cuthbert Horsley. Mr. A. B. Plummer, Hon. Secretary of the N.A.A., was among those present.

## CHIPS.

The fourteenth annual dinner of the Clerks of Works' Association will take place on Saturday, Feb. 8, at the King's Hall, Holborn Restaurant, Mr. Beresford Pite, F.R.I.B.A., president of the London Architectural Association, will occupy the chair.

In the House of Commons, on Monday night, Mr. Clancy, the Nationalist member for Dublin county, introduced a Bill for the amendment of the law relating to surveyors for the county of Dublin.

The Bishop of Chichester will open the Rustington Convalescent Home at Littlehampton, which is being erected, at a cost of £30,000, for the working classes of North-West London by Mr. Henry Harben, of Hampstead, and Warnham Lodge, Sussex.

Sir Ughtred Kay-Shuttleworth, Bart, M.P. for the Clitheroe Division, has offered to give a site and £1,000 to the Padiham authorities conditionally that they will take in hand the erection of a new technical school. The matter is being taken up.

At Tuesday's meeting of the London County Council, letters were read stating that the Queen would be unable to face the fatigue of opening the Blackwall Tunnel, and that the Prince and Princess of Wales had consented to act in her stead in May next. It was agreed that the Metropolitan Sewers and Drains Bill should be reintroduced next session. The proposal so often made that Queen Charlotte's Hospital in Marylebone-road should be allowed to be rebuilt 7 ft. in advance of the present line of frontage was, after a long discussion, rejected on the recommendation of the Building Act Committee.



TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING News, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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### ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX, XL, XLI, XLVI, XLIX, LI, LIII, LIV, LVIII, LIX, LX, LXI, LXII, LXIII, LXIV, LXV, LXVI, LXVII, LXVIII may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. B.—M. W. N.—C. Burchell.—W. W. and  
Son.—E. W. H.—A. O. S. Co.

## Correspondence.

FRANCIS MORTON AND CO., LTD.

To the Editor of the BUILDING NEWS.

Sir,—On the 20th instant, I was appointed receiver and manager of the whole of the assets of the above company, in a debenture-holder's action, commenced in the Chancery of the County Palatine of Lancaster, Liverpool district, and at an extraordinary meeting of the shareholders, held to-day, it was resolved to wind-up the company voluntarily, and I was appointed liquidator.

I take the earliest opportunity of letting you know the position of matters, and it is my intention to call a meeting of the creditors as soon as practicable, in order to lay before them a statement of the company's position. In the mean time, the company's business will be carried on by me, with a view to the sale of the company's business and assets, as a going concern. — I am, &c.,

H. D. ESHELBY, Receiver and Liquidator.  
24, North John-street, Liverpool, Jan. 27.

Alterations are being made to the Bromley Vestry Hall, embracing the ventilation, which will now be carried out entirely on the Boyle system.

The offices of the Val de Travers Asphalte Co., Ltd., are removed from Palmerston Buildings, Old Broad-street, to Hamilton House, Bishopsgate-street Without, E.C.

Princess Christian has, at the request of the Queen, consented to open the new General Hospital at Birmingham, which is being erected from the designs of Mr. William Henman, of that city, at a cost of nearly a quarter of a million sterling.

## Intercommunication.

### QUESTIONS.

[11614].—**Church Walls.**—Will someone kindly give a young architect advice as to what he should do with the interior walls of a brick-lined church, built some three years ago, which has become very unsightly, owing to the soda or other salt showing itself in white patches all over the walling? Could any wash be applied to "kill" the salt, and bring out the natural colour of the brickwork? The outer walling is of stone, pointed with cement.—  
J. W. R., Liverpool.

## LEGAL INTELLIGENCE.

T. DREW-BEAR, TOLPUTT, AND BROWN V. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON. —The hearing of this protracted case, the earlier stages of which we reported in our issues of July 17 and 24 and November 20 and 27, 1896 (pp. 93, 133, 755, and 769 last volume), and our issue of last week, p. 149, has been continued from day to day at the Old Bankruptcy Court, Portugal-street, W.C., before Mr. Edward Ridley, Q.C., sitting as the Official Referee. It was, it will be remembered, brought by several builders' merchants, suing as trustees of creditors of William Brooks, of Folkestone, builder, against the Guardians of the Poor for St. Pancras, and their architects, Messrs. A. and C. Harston, for a balance of £24,226, or alternately £24,265, alleged to be due on a building contract for the completion of St. Pancras Workhouse. Mr. Reginald Bray and Mr. A. A. Hudson appeared for the plaintiffs; Mr. English Harrison and Mr. W. Moyses for the defendant guardians; Mr. A. G. McIntyre and Mr. R. W. Turner for the defendant architects. The case for the plaintiffs is that some years ago the St. Pancras Guardians resolved to reconstruct their workhouse premises in King's-road, Pancras-road, and appointed Messrs. Arthur and Christopher Harston, of Leadenhall-street, E.C., as their architects. The original contract for certain sections of the work was undertaken by Messrs. Kirk and Randall, of Woolwich. Disputes arose, and in 1892 Messrs. Kirk and Randall desired to be relieved of further duties under the contract; fresh tenders were invited for the completion of sections 1 and 2, and that of a Mr. William Brooks, of Folkestone, was accepted for £50,861. Brooks's contract was to have been completed in 15 months from May, 1892; but delays arose, and in November, 1894, the work was stopped. Messrs. Drew-Bear, Perks, and Co., 71A, Queen Victoria-street, E.C., who supplied the ironwork, Mr. Henry Tolpitt, of Folkestone, who supplied the timber, and Mr. James Brown, of Cannon-street, E.C., and Brintree, who supplied some of the bricks, now sued as trustees of the creditors of William Brooks for £24,226, or alternatively £24,265, balance alleged to be due to Brooks. The first claim was made up as follows: net cost of executed work £65,479 plus 10 per cent. profit £6,547, making £72,026. On this account it was agreed that £47,800 had been received on account under the architects' certificates, leaving a balance claimed by plaintiffs of £24,226. The alternative claim estimated the net cost of the work executed at £60,479, as before, but reckoned the 10 per cent. profit to be added on a basis of the contract price of £50,861, so that £5,086 (in lieu of £6,507) was claimed to be added to the net outlay, making, with £1,500 claimed for damages, the total of £72,065, and the amount claimable, after allowing for the £47,800 already received under the architect's certificates, £24,265. In addition, plaintiffs claimed 5 per cent. interest from the stoppage of the works at the end of 1894 to the date of hearing. We take up the thread of the narrative at the point where it was dropped in last week's issue. Mr. English Harrison, in resuming his speech on behalf of the defendant guardians, said that if the Official Referee should come to the conclusion that the old contract was closed, they must consider on what terms the trustees continued to carry on the work—that was a most material point. He contended that all through from beginning to end the trustees acted on the supposition that the old contract was binding upon them. From first to last they had always asked for certificates, and they acted from first to last on the basis that they should carry out and complete the contract. On April 26, 1893, Mr. Brown, one of the plaintiff trustees, wrote to Messrs. Harston, stating: 'The creditors are desirous of completing their contract if they can do so,' and Brown had told them that he studied the bills of quantities in order to consider whether or no they should complete the work. Further, it was provided in the old contract that 20 per cent. retention money should be kept back, and the trustees asked that this particular clause should be varied, so that the margin retained should be reduced, and this the guardians agreed to. That proved that all parties were acting on the terms contained in the contract. Yet, further, Brown had stated that he regretted not having appealed to Mr. Harston more often, as he might then have got the work done more quickly; in other words, he

was sorry he had not acted on the powers given him under the contract. Were they to take it that Harston and Poole had no power to reject improper material? The guardians went out of their way and refused to back up Mr. Harston, and said that they would not insist on the full terms of the contract being enforced. The whole struggle between the parties had been in the attempt to evade provisions of the contract. It was therefore evident that the plaintiffs could not sue on a *quantum meruit* at all; but if there were any damage caused owing to the delay in giving possession of the site, that would have to be made good to the contractor. It was a monstrous thing to attempt to make the ratepayers in 1896 pay for the default of the ratepayers in 1892. The Official Referee said he was afraid he could pay no attention at all to such an argument. Mr. Harrison explained that he only mentioned that point for the purpose of showing how important it was that a contractor should not acquiesce in decisions and say nothing against them at the time to the persons who were responsible, and then come down at a later period on some one who was a totally different person. Mr. MacIntyre then proposed to speak on behalf of the architects; but the Official Referee intimated that he should object to hear him until the evidence for the guardians had been given. Both Mr. Harrison and Mr. MacIntyre protested, the former remarking that he didn't know what evidence to adduce first. The Official Receiver said Mr. Harrison had argued that Mr. Harston was acting as an arbitrator, and that, as such, an action could be brought against him, and he could not hear Messrs. Harston's counsel until the guardians had called their evidence. After a long legal discussion, Mr. Harrison put his first witness, George Poole, the clerk of works, in the witness-box. The witness proved to be very deaf, and unable to refer to his notes or diary without assistance. His discursive and qualified replies evoked frequent manifestations of impatience from the examining counsel, and in cross-examination it did not prove easy to obtain a direct affirmative or negative to a single question. He deposed that he was now 66 years of age, and had been engaged in the building trade for over fifty years, and had acted as clerk of works for Messrs. Harston for the last twenty years. Among a few of the large contracts that he had been engaged upon were the Natural History Museum, the Imbecile Schools at Darenth, Limehouse Town Hall, Chelsea Workhouse, Bethnal Green Schools, and in his earlier life he was a foreman in the works of the Great Northern Railway Co. He was now in the service of the St. Pancras Guardians. He had heard the evidence given by the witness Fearon in the case. He had not spoken disrespectfully of Messrs. Drew-Bear, Perks, and Co. when he heard that they were going to take the ironwork. Drew-Bear and Perks knew what was required, and they could do good work if they liked. They had done a large job for Messrs. A. and C. Harston before, and knew their style of work. It was not true that witness had said to Fearon that he always made a practice of condemning the first parcel of goods received, for by that plan he got people to send better. Witness was clerk of works during the whole time that Kirk and Randall held the contract. He believed that two of the men afterwards employed by Brooks were there then—Gosby and Robinson. On June 1 and 2, 1892, Mr. Milward, the clerk to the guardians, sent for witness to his office respecting the erection of temporary buildings. Witness was directed to show Brooks and Fearon the ground plan, and to explain the best way to conduct the job. At that time Brooks's tender had not been accepted. Witness saw Brooks, and explained the nature of the job in a friendly way at the office of Mr. Harston. As to the alleged delay in getting possession of the site, there were always from the beginning more men put on the job than were required. The job was flooded with men—country workmen—and there was much waste in wages. He never saw such a rough and ragged lot. Witness tried in every way to assist the contractors to get possession of parts of the building to be pulled down. He in no way interfered with the clearing of the site; but they could not get at the particular points they wanted to work at. It was absolutely false that he told Fearon not to get or use the hoarding. It was a huge job, five acres of ground being inclosed, and they did not want all the hoarding at the time. It was totally untrue that the first lot of Thames ballast was condemned on July 14th, 1862. His diary of that date said, "a quantity of satisfactory Thames sand come this day." On Feb. 14th, 1893, Brooks certainly came up about a complaint witness made, but it was untrue to say that these complaints began in July, 1892. There was not a new brick put into the foundations anywhere. Witness never objected to old brick being put into the foundation, but he did complain of too many bats. The diary produced showed that he did not say the bricks were too soft and not cleaned good enough. He merely cautioned the contractor, as his diary produced showed. The diary showed that he did say that the bricks used in the foundation were not cleaned sufficiently—they had left the old mortar



on them. He said to Fearon "the word is 'w-h-o-l-e' bricks has to be used," but he did not mean to enforce it. The Official Referee: What did you mean? I meant whole bricks, and not bats. Mr. Moyes: And the contract says whole bricks. The Official Referee: When the clerk of works goes and tells the builder not to use anything but whole bricks, he dare not do it. The clerk of the works has no business to say such a thing and not enforce it. Mr. Moyes read the clause of the specification relating to the use of the whole bricks under the heading of Old Material, which said that such old bricks as are sound, whole, and approved by the architect may be cleaned, stacked, and reused. The witness: As long as it was anything in fairness I was pleased to let it go. But I did it by way of caution. Examination continued: It was not true that in a 14in. Flemish bond wall witness insisted on a half bat being cut out of a whole new brick. He had heard Franks's evidence, and it was decidedly untrue. A man of witness's experience would not do such a thing. It would be the trick of a dunce and a donkey too. The Official Referee: Franks was a very good witness. Examination continued: He insisted on having a man put into the trench whilst the foundations were being laid to level up each barrow-load of concrete when it came in. He had it rammed, but not packed back—a different thing altogether. As to Fearon's complaint that he could not get the specification until Aug. 1, 1892, he could only say that there was the specification in witness's office for them to see. They did not want the specification at all then. Witness was doing all the work for them at that time in regard to taking out quantities and assisting them in every way and shape. He was doing that out of kindness. Witness was answerable for the specification, and they did not want it at the time. Fearon did say before Aug. 1 that he had not then got the specification. Witness went and procured it, and deposited it at Brooks's office soon afterwards. He (witness) had to vary the depth of the foundations in C block, but no one could give the levels until they had excavated the old work. At that time they were on friendly terms, and witness helped them all he could. They got possession of part of the old H block on Aug. 22, but although part of it was kept up, Brooks could have begun on the ends if he had liked. There was nothing to prevent Brooks getting on with his work. Until he heard Fearon giving evidence in court, he never heard of the delay. The contractor kept part of the block left up in use for his own stores, and so saved money. When the blue Staffordshire bricks came on the job witness did complain that they were too sandy, and asked for them to be removed. He never condemned; he had no power of condemnation. The two blue bricks produced were not fit for facings. Witness also complained that the copings were also sent in before the bricks that had to go underneath. He remembered sending away red facing bricks on August 30th as very unsatisfactory; his diary would show this. He called the general foreman's attention to this. Witness went at his own expense, and in his own time, down to Slough, to get a look at the bricks in Nash's fields; but he never spoke to a soul there. He afterwards wrote to Mr. Harston, telling him of these bricks, and when Fearon came on the ground, he said, "I think you will find some bricks on the ground down there that will about do." This report to Mr. Harston was openly set down in his diary. Witness had to cross off a good many facing bricks; but it was untrue that he crossed and slashed them off in a temper. He did not think he lost his temper once in the whole affair; he had a great deal to contend with. With regard to the ironwork, Mr. Harston passed a girder that witness objected to, and it was probably then that witness might have said it would have to come out, because the thing was being done in defiance. Fearon told him that the girders were sent back, and witness remarked that such action was premature. The girders were brought back a day or two afterwards. They were badly-made things. Mr. Harston considered them of inferior make, but did not consider the quality of the iron objectionable. He did not see Mr. Drew-Bear. Mr. Moyes said that no prudent man would allow himself to be seeing the manufacturers, who continually came to justify their own goods. The clerk of works had only to deal with the contractor and the contractor's men. Examination continued: Fearon told witness that Drew-Bear had said that one girder should not have been sent. The joist which was objected to as not of fair weight was very light—something like 15 per cent.—and witness asked that they should not be built in until he had heard from Mr. Harston. Letter produced from Mr. Harston to Brooks: "Those (girders) which you have delivered have joists of different sections, mostly light, and the weight is made up by a heavier top plate." Fearon promised a proper-weighted joist, and saw Drew-Bear. They put up the light girder after all, in defiance. Witness said he should try and have it out; they knew witness was in a responsible position, and when people defied him it made him speak out a little bit strongly.

With reference to the ordering of bricks at Slough, witness said he never saw Mr. Nash, nor anybody belonging to him; witness did not, as Fearon said in his evidence, select a malm pavior at Nash's field. It was not true that Brooks's foreman, Brown, was rendered ill by witness's treatment of him. Witness considered Brown a good foreman, who would have done capital work had he been allowed to do so. Witness said he saw Arthur Edward Brown, the brickmaker, with Fearon, and explained to him that he wanted a better class of brick, so as to save any further friction. It was untrue that witness flew into a towering rage, and refused to listen to any explanation; nor did he go and cross off all the brickwork—such a thing was impossible. There had been a difficulty as to facing bricks, or witness would not have taken the trouble to go to Slough. The contractor was allowed to pick from the old bricks on the ground, and was, in fact, given every latitude. As to new stocks, he had never rejected any so good as those produced and spoken to by Smeed, Dean and Co.'s representative. From time to time Fearon had carted off the ground bricks that witness would have permitted to be used. Witness drew Mr. Harston's attention, in the presence of Fearon, to the fact that large quantities of old bricks were being carted away; these bricks had never been rejected or even complained about. Witness's diary showed that he complained of the unsatisfactory way the concrete was being mixed with too many broken bricks and too little sandy balks, and not being half turned over or rammed. Witness did not, and could not, condemn any material. In reply to the Official Referee, witness said he had not the slightest doubt that the evidence of Mr. Arthur E. Brown as to the red bricks was accurate—that witness told Brown he would take good care that these bricks were cut out and a good many more besides, and that if Brown called them good bricks he didn't know what a good brick was. The Official Referee: Then you say that was not "condemnation"? Witness: No. The Official Referee: Was the builder to suppose that the clerk of works did not mean what he said when he made these random statements? No answer. In reply to Mr. Moyes, witness said he marked the bricks because he objected to them. If Fearon had said he would leave them till Mr. Harston came there was nothing to prevent him. To have crossed the bricks as witness had said, he should have needed about half-a-dozen people walking after him with fresh pencils. As to the Thames sand, witness never heard where it came from, and never rejected any—he could not help what other people did. As to the seven barge-loads of sand alleged to have been rejected, there was not a barrow-load sent back to his knowledge. Thames sand was now pretty well all coal rubbish. The Official Referee: There was no coal in the samples produced in court. Witness saw in his diary for October 12, 1892, he complained to his foreman, Brown, and to Fearon that the sand was very salt and tested it. The Official Referee asked witness how he reconciled this entry with the evidence he had just given. Mr. Moyes: The clerk of the works had no power to reject—he could only condemn. Examination continued: Brooks and Fearon had always the right to appeal to Mr. Harston, and in some cases they exercised that power. Next day's entry in the diary showed that, the sand still being salt, he was compelled to give the general foreman written notice to stop the further use of it, until Mr. Harston's judgment could be taken on the matter. Fearon promised to order sand from a firm at Ware. Witness did tell Fearon that he might use Mossop's sand which had been left on the job by Kirk and Randall. Dealing next with the ironwork, witness denied that he ever went round the job with a penknife to test the joints between columns and joists, and he never told Fearon he wanted an engine-fitted joint. He wanted firm honest work done, and expected to get it. He believed he told Gosby on November 8th, 1892, that though the architects had passed certain girders, he never would. It was not true that certain door lintels of coke breeze, condemned in June, 1893, had been put up 5in. too high, from drawings made either by witness or Mr. Harston. There were no drawings, but general instructions. Fearon appealed to Mr. Harston, who supported witness. The lintels had been put up some months. Any ordinary builder would have measured the doorways before putting up the brickwork. Witness rejected six columns on the ground that the brackets were out of plumb; as the diary would show, the foreman was impertinent about it. Witness was taken in great detail through the entries in his diary as to the rejection of the columns and girders, and as to the interviews Drew-Bear and Fearon had with Mr. Harston on the subject. Mr. Moyes put in and read an entry in the witness's diary for 26th September, 1892, relative to the interviews with the builders' merchants who supplied the columns, whereupon the Official Referee remarked that if this was to be taken as a correct statement of what took place, he should have to disbelieve both Drew-Bear and the gentleman from Nottingham. Why did nobody, in cross-examination, ask Mr.

Drew-Bear about it? Examination continued, witness said he was asked to meet the founder of the columns from Nottingham about their rejection, but he objected to do so; the only persons witness had to deal with were Fearon or Brooks. As to the rejection of iron rods, witness said he had had a lot to do with Messrs. Drew-Bear, Perks, and Co., and he did not put himself to the trouble he should have done otherwise, knowing that they were honourable people, as he still thought. The last time he appeared in Court as a witness, it was on behalf of Mr. Drew-Bear. It was true that witness objected, in September, 1892, to the holes in certain bars to receive the rods in plaster-work being too large, and Messrs. Drew-Bear and Co. had to have a special punch made to meet his requirements. Witness never insisted on the holes being punched so small that the rods had to be hammered to get them through. Witness insisted on the rods being in one length; there was no difficulty in doing that. He had never approved of any drawing submitted to him by the ironfounders. As to the iron handrail in Block A, witness emphatically denied that he ever saw it before it was put up; had he done so, he would have objected to it at once. When he saw it up, he pointed out that the section was altogether wrong. It was an absolute falsehood to say that they had been at work six weeks on it before he examined it. As to the drain-traps, witness did insist on having Amphill's, or similar, as specified; he could not alter the specification. As to the landing stone supplied by the witness Armitage, witness objected to its being laminated, as all laminated stone would flake. All except one piece of the rejected stone was taken away, and that was a very good sample of how laminated stone was wearing. That piece was the top step of the hall in B block. They deceived witness in putting in this piece. Witness went in great detail through the circumstances as to the materials to which he objected on the ground of quality, including the tie-beams, flooring, and other woodwork, the slating, the chimney pots, and galvanised tanks, and also as to the construction of roads. Where other contractors had to come on the job, such work could not be done without interference and delay, and that was provided for in the specification. There was no undue interference, except, perhaps, a little by the well-sinker, and also to some degree with the laundry chimney. It was untrue that witness always interfering with the workmen—he was very friendly with the men. (Counsel having complained of laughter in court during the examination, the Official Referee remarked that the matter was a very difficult one to deal with, and to know what weight to give to this evidence. It was not easy to keep out of his mind the ludicrous side of the witness's evidence.) Cross-examined by Mr. Bray: The diary is my evidence, for my memory is not so good as it was. The entries were made every other day or so, from rough notes now destroyed. Confronted with an entry in the diary stating that on a certain Monday he had just entered up the week's notes, the witness admitted that they were written up once a week when the report was made for Mr. Harston. Witness kept copies of all important letters; he could not produce the copies, for he had not got them. Witness assisted Brooks and Fearon all he possibly could by preparing working drawings. He conscientiously passed all the materials he could. Could not account for an accusation made against witness by Brooks in February, 1892, as recorded in the diary. As a whole, the materials brought on the ground were about the average for contractors, but they were not looked after and taken care of. The complaints in the diary were not more than usual. The Official Referee: There is not a page in this diary without complaints. Witness: Drew-Bear, Perks, and Co., Brown, Baines and Beard, Tolputt, and others were all good and responsible people; if he had complained of their materials—iron, bricks, timber—they must have been bought too cheaply. Pressed by Counsel, witness said he did not know the prices given, and so could not say they were low. Witness should say that generally from first to last Fearon was a party to scamping the work, but he could not point out entries confirming this in his diary. The fact that Brooks had too many men on the work did not look like scamping. The men wanted more looking after. Witness was closely questioned as to the B2 girders supplied by Messrs. Drew-Bear, Perks, and Co., one of which was objected to by him as being 2lb. per foot too light, and the other too heavy. Witness did not know that any margin was allowed as to weight in ironwork. Of the two girders weighed, each 17ft. 2in. in length, one proved to be 19lb. under-weight, and the other 29lb. over-weight in the aggregate. Mr. Harston was appealed to, and wrote saying that the deficiency in the one girder was trifling, and not worth notice. Five days afterwards Mr. Harston rejected the girders. Six of the cast-iron columns were rejected because the brackets were wrong. There were two defects, the first being that the bracket was out of the upright, and secondly that it was not at right angles to the capital. [The original mould from which the brackets were cast was produced in



court.] He did not say that the strength was diminished by the position of the brackets, but the effect as seen was very bad. At first Fearon had no one on the works who could take the levels, and on witness's recommendation Fearon employed, from 19th July, 1892, witness's son, Alfred, a surveyor, to take the levels for five or six weeks. Then Mr. Harston wanted Alfred Poole for other work, and Fearon engaged another of witness's sons for the work. Alfred Poole was competent, but not more so than the witness himself. Witness would not swear that he never marked more than one brick at a time. It was absolutely untrue, as George Brown had sworn, that he (witness) got into a temper and marked the bricks without noticing whether they were good or not. He only once marked the bricks with a carbon; most of them were done with a pencil, and the scratch would remain, even if Mr. Harston overruled witness. Witness had no power of condemnation. Confronted with an entry in his diary, in which he recorded that he had told Gosby, the bricklayers' foreman, that all the bricks he had marked must be cut out, witness said Mr. Harston had just been on the works, and inspected the bricks which had been marked nine months before. Witness marked eleven sashes and frames with lead pencil, and the men planned the marks out so that witness could not trace them: that was a little bit of deception that he was subject to all along. There had been no material friction with Kirk and Randall—only a little more than usual. Witness could not get on with their foreman. The sample of picked stock bricks produced in court, and referred to previously, was cut out of the workhouse in witness's presence as a specimen of very common work, very poor facings, some being of very poor colour, not equal to the needs of modern workhouses. The specimen was of bricks from Nash's, of Slough. A great part of the work done by Fearon was very much better than that. Witness and Mr. Harston were present when this was selected one day last week, and they also selected the defective pieces of timber, also produced, after examining all the roofs. As a whole, the brickwork at St. Pancras was a very fair job; there was no difference between Brooks's and Kirk and Randall's works. Witness was cross-examined as to the difficulty in the supply of bricks, and was asked to explain an entry in his diary for Oct. 15, 1892—"The difficulty in getting a satisfactory facing brick may partly arise from Fearon omitting to send a competent person to explain the quality of brick required," when he knew that Fearon himself had been down to Eastwood's, but he did not consider Fearon competent to judge, and he wanted a brick to comply with the specification. He agreed with the witness, George Wragg, of Shoebury, called for plaintiffs, that if he wanted a hard stock brick it could not possess a good colour, and that as for malms chalk had to be mixed with the clay to improve the colour; the softer brick was the most expensive. This only referred to the Essex bricks. Witness was questioned at great length as to the complaint concerning the sand and the rods through the floors. The latter were specified to be either in one length, or, if in two lengths, to lap in the middle with an extra hole. Witness would not admit that when Brooks had purchased a stock of short rods, and proposed to lap them, he compelled him to use long rods; he advised him to use long ones, for the contractor's own benefit. Fearon did take out the short, lapped ones and put in long lengths instead in C block, by witness's request, as a letter (produced) by witness to Fearon in November, 1892, showed. To the Official Referee: He asked Fearon to do this, but he expected it to be complied with. Examination continued: At that time the walls were up to 5 ft. above second-floor level, and these rods were in the first floor, and certainly there was great difficulty in getting the long rods in. The coke breeze lintels were put in according to witness's directions, and nine months afterwards witness insisted on lowering them 5 in. Witness did not know that two were not lowered, and were still to be seen. As to the flooring, Mr. Corderoy and Mr. Young, the surveyors, went over the materials left on the ground by Kirk and Randall, and decided what were to be taken over by the guardians, and these materials were purchased by Brooks. Among them was flooring, which was stacked. When Fearon tried to lay it, witness objected to it. It was a pure invention to say that witness declared he condemned the stuff when Kirk and Randall brought it on the ground, and he should condemn it again. Certainly witness said the flooring was bought too cheaply. Witness objected to the old hoarding being planned and utilised for a coach-house roof, although this was specified to be rough-boarded and lime-washed; he did not consider hoarding suitable or clean enough. Counsel was questioning witness as to the difficulty with the Amphill trap, when the Official Referee remarked there was not much contradiction as yet as to material facts, but as to what it all amounted to. As to the York steps, witness said he was greatly deceived; one piece was rejected by Mr. Harston, but it was afterwards brought back, faked up by the contractor, and used in the building. Witness

could not find an entry of the matter in his diary, but he called Mr. Harston's attention to it. Witness went with Armitage to Messrs. Harston's office when the stone was tested by hammering it, but could not recollect the details, nor was it entered in his diary. He had had great experience with York stone, and knew that plenty of block and un-laminated stone was to be got. The Official Referee: The authorities state that with Yorkshire stone the laminated beds are the hardest. At various times members of the sanitary committee and Mr. Milward, the clerk to the board of guardians, were on to the job, and witness reported to them in October, 1892, that the works were delayed by various causes, but that the contractor was anxious to push on with the work. In the following February (1893), witness noted in his diary that there were too many men on the works, and witness considered it would assist the contractor if he could get possession of the old A block. On April 20, 1893, he found by his diary that complaints were made against him to the guardians that he had condemned work which had been passed by the architects, and again on January 23, 1894, he was aware that he was accused of arbitrary conduct, and of obstructing Fearon in his work. Re-examined by Mr. English Harrison: He had not, as a fact, obstructed the work. He had simply done his duty in cautioning Brooks from time to time, and he did that when he thought it to be necessary. It was his duty to observe the character of the materials supplied. He would not have accepted a suggestion from any particular guardian as to the way in which he was to perform his duty. He was on good terms with Fearon at the beginning of the contract. He thought that Benhams, who supplied the fittings for the laundry, had delayed the works a little. Shafto, recalled, stated that the eight (not six, as Poole stated) columns were rejected because the brackets were a little askew, and were recast (invoice produced). Mr. Christopher Harston, F.R.I.B.A., one of the defendants in this action, said he had been an architect and surveyor, carrying on business at 15, Leadenhall-street, in conjunction with his brother Arthur, for 30 years. Among the works carried out from his firm's designs and plans were the Poplar and Stepney Sick Asylum, cost about £50,000; the Darenth Pauper Imbecile Schools and Asylum, £150,000; the Kensington Workhouse rebuilding and casual wards, £35,000; Paddington Workhouse Infirmary, £50,000; Chelsea Workhouse and Infirmary, £70,000; Lewisham Workhouse Infirmary, £56,000; St. Pancras Casual Wards, £11,000; and numerous works for the Metropolitan Asylums Board, including the fever hospitals at Fulham £15,000, Gore Farm £22,000, and Tottenham £54,000, the last being carried out without a contractor, &c., and they had works in hand or in progress of this class amounting in outlay to about half a million. As to the present case, Fearon never consulted witness, nor complained to him about wanting another entrance on the north side of the site, in the King's-road. Had he done so, witness would simply have told him to make an opening and construct a road as he desired; but it would have been expensive to the contractor. Fearon made no complaint as to the hoarding, nor did witness hear of any difficulty in the matter except that Brooks left a wall up (in lieu of erecting hoarding on its site) which witness considered dangerous, and wrote to him accordingly. Witness opposed no obstacle to the contractor getting possession of portions of the site, and when appealed to on the subject, dealt with the matters immediately. Witness explained the efforts he made to facilitate operations in the laundry block; he considered that Fearon could have got on with the work in that block earlier. To the Official Referee: I did not point out to Fearon how he could have expedited this section, as Fearon never took any notice of witness's orders. Mr. Harrison: I suppose Poole should have made any such suggestions. The Official Referee: But you, on behalf of the guardians, have repudiated Poole, and have said that the board looked to the architect to settle disputes with the builder. Examination continued: As to the sand, witness always made a point, on coming on the works, to look at the sand, as it was an important item. On one or two occasions witness found the sand salt, and on another occasion witness found that another and too fine a quality was being used. Witness objected to the salt sand, but did not order it to be removed from the site; he allowed it to be used below the damp-course level; and as to the fine sand, he permitted it to be used with coarser stuff, as it would do no harm if used slowly with better sand. At a later date, Nov. 14, 1893, witness observed old material—brick rubbish and old lime—concealed under the sand. Witness spoke to the foreman about it, who declared that he knew nothing about it; he wrote a letter (produced) saying that he regarded it as a species of fraud, and that if it recurred he should take strong measures. Witness did not know the foreman's name. Mr. Hudson objected to this evidence as unexpected. The Official Referee said he should attach no importance to the evidence if it represented an isolated instance;

if it were an habitual practice it would be proof that the work was scamped. Examination continued: Sand may look all right, but still may be impregnated with salt—a fact which must be tried by tasting. Below-bridge sand varied much, from mud to gravel into which bits of coal had fallen, and therefore witness specified above-bridge or pit sand; but there was not now, as the witness Newman had stated, not much above-bridge sand on the market, and what there was came in small boats. The process of washing below-bridge sand had improved lately, but witness did not think it removed all the salt. Coming next to the columns, witness rejected two out of eight basement columns on September 8th, 1892; all were rough and poor spongy castings, and two exceptionally bad. In October a foreman said that the contractor had himself sent back other columns. Mr. Hudson: Witnesses have stated that Poole and Mr. Brooks or Fearon had condemned the other columns. Mr. English Harrison, with great heat, said he would not allow his witness to be interrupted. The Official Referee: The evidence of Fearon and Drew-Bear show that these columns were rejected by Poole, and that both Fearon and Drew-Bear protested. Witness continued to say that he looked at the columns said to have been rejected by the contractor, and found that the capitals or brackets were askew and the columns were rough. On Oct. 21st witness rejected other columns for similar defects. Drew-Bear saw witness about the columns, but witness would not recognise him, as he was only a sub-contractor, but added that if the contractor wished for his decision, he would give it. Witness ridiculed the suggestion that the brackets should be screwed on, for they were needed to add strength, and they might as well be glued on as merely screwed. It was material that the brackets should be cast with the capital. Witness would have been only too delighted if he could have passed the columns on the site, and he decided the matter to the best of his judgment in the discharge of his duty. On the 24th November witness inspected two B2 girders, and found them with unequal joists. Witness received a communication from Poole as to the weight of the girders, and found them short. The top plates did not increase the strength so much as if the weight had been at the bottom. These girders had to support three stories and the weight of the roof. One of the girders was about 3 per cent. short; whereas the margin witness allowed was about 2 per cent. either way. Witness wrote to Poole that the deficiency was trifling, and did not matter. Witness endeavoured throughout so to exercise his authority in a conscientious manner; he never told Fearon, as that witness had asserted, that he should always uphold the clerk of works. Witness never heard any complaints or appeal from the contractor as to the extra work alleged to have been to the rods. As to the York landings, witness objected to one piece as "beddy," or laminated, and said some other position must be found for it. Afterwards witness rejected three more, and also one long step—the top step in the hall, the principal place in the whole building. Afterwards Poole objected to a York landing; but after examining a sample with Armitage and Poole, witness passed it. York stone could be got free from lamination. In reply to the Official Referee, witness said laminated stone decayed when placed inside a building. As the result of his experience, he objected to all laminated stone, and in this case had specified that it should not be introduced. Armitage had already supplied other landings with slight laminations. The Official Referee: But you specified no laminations, and now you discriminate. Witness continued that in 1892 there was a difficulty in getting facing bricks. Witness had no communication with Nash, of Slough, about this job; nor had he used his bricks for many years. Fearon wrote that he had great difficulty in getting passed bricks that were sent, and witness wrote giving the names of Nash, Wright, and Ogle as makers of bricks of the right sort. Some were sent from Nash which were not good enough, and afterwards witness agreed to allow extra for red bricks to be substituted for the stocks in C block. As bricks were called by different names in the various fields witness always described the kind of brick wanted in his specifications, and the London School Board specifications followed a similar course. It was not impossible to comply with his specification, although difficult in a year of scarcity. Witness never rejected bricks absolutely; but he refused to allow unsatisfactory ones to be used as facings, although they could be utilised elsewhere. The red bricks were more chipped and cracked than those of Brown usually were, but otherwise were of good quality; but his objections were very few, considering the large quantities used. The timber generally was of inferior character, and his judgment was recently confirmed, for on a close inspection of the roof of C block, he found many shaky pieces, especially some purlins and one or two tie-beams. The same thing was the case in the laundry. He thought this would show he did not exercise his authority with undue severity. At this stage, the examination in chief of this witness being completed, the hearing of the case was adjourned till March 1.



**AN ARCHITECT SUES HIS ARTICLED PUPIL.**—The case of "Sadgrove v. Coad" came on for hearing before Mr. Justice Charles, sitting without a jury, in the Queen's Bench Division of the High Court of Justice, on the 14th inst., it being an action brought by Edwin James Sadgrove, an architect and surveyor, of No. 22, Surrey-street, Strand, to recover from the defendant, John Coad, of 25, Monson-road, Tunbridge Wells, damages for the alleged breach of certain covenants contained in an apprenticeship indenture dated Oct. 23, 1894, and entered into with Mr. Richard Henry Coad, deceased, the above-named defendant being now sued as his executor. The plaintiff's case was that, by the indenture in question, Mr. Percy Arthur Coad (son of Mr. R. H. Coad), was articulated to him for the term of three years, the indenture containing a covenant that Mr. Percy Coad would not absent himself from the said service without the plaintiff's consent, and notwithstanding that covenant, he, on Sept. 15th, 1896, did absent himself, and refused further to serve plaintiff, whereby he had suffered damage, as young Coad was then of value to him. The main defence set up was an allegation that the plaintiff had broken his covenant to teach Mr. Percy Coad to the utmost of his skill and knowledge in the practice or profession of an architect, and had employed him in other work than that agreed upon, and whereby he had failed to obtain the benefit of the agreement. The defendant counter-claimed for the return of the premium (£50) paid to the plaintiff on the signing of the indentures, and also for damages for breach of covenant. Mr. Kemp, Q.C. and Mr. J. C. Earle appeared as counsel for the plaintiff, and Mr. McCall, Q.C. and Mr. G. M. Cohen for the defendant. The plaintiff in his evidence in chief said that Mr. P. Coad at the time he left his office was of great service to him in his profession, and to fill his place it would cost him £250 a year for a qualified man. Cross-examined by Mr. McCall: He did plenty of work as an architect. Young Coad prepared drawings under his supervision. Coad was to have been secretary and clerk of the works of a company which he had promoted at Dulwich at a salary of £100 a year, and there he would have had a splendid opportunity of seeing the building of houses on the ground. Out of his salary he would have had to pay an assistant a salary of £1 a week, as the post would entail a great amount of work. The salary would have been paid by the company. The learned counsel cross-examined witness at some length with a view to showing that Coad had been sent on miscellaneous errands of a personal character for witness which had nothing to do with his profession. The witness said that Coad had never made any objection to going for little errands for him occasionally, or ever put that forward as a ground for leaving him. Mr. Thompson, an architect and surveyor, gave evidence as to occasionally assisting Mr. Sadgrove in his business when young Coad was there. Coad was instructed in the work of the office as occasion occurred, and he had never complained to him about not being instructed. Mr. Harry Watkins, examined, said that he was articulated to the plaintiff on July 4, 1894, and was in the office the whole time Coad was there. Coad did architect's work and surveying work, and was instructed from time to time by the plaintiff, and when the plaintiff was away, qualified assistants were left in charge. He had heard Coad complain of being sent on messages. Coad did object to it, but it occurred very seldom. Coad made progress in his work. Cross-examined: In 1896 Coad was of use to the plaintiff in quantity surveying. Coad did complain to him that he was put to do work that an office-boy should have done; he had complained of dusting the plaintiff's room. Re-examined: The housekeeper employed there did not dust properly sometimes, and to save the trouble of sending for her, he and the other gentlemen employed there used to dust sometimes. The housekeeper had an unpleasant temper, and it was to save her tongue. Mr. King, an improver in the service of the plaintiff, gave evidence as to Coad being treated as an articulated pupil in the same way as Mr. Watkins. Witness had gained more experience at Mr. Sadgrove's than he did when he was under articles. There was more work than they could do at Mr. Sadgrove's. Coad was instructed in the work of the office. Mr. Percy Coad, in his evidence, said that when he first went to the plaintiff's no office boy or menial was kept. He dusted the plaintiff's office in conjunction with Watkins on several occasions. The plaintiff had instructed him in the way to take abstracts and how to square dimensions, but that anyone could learn in five minutes. The plaintiff had also taught him how to keep the papers in order, and to keep the cash accounts of the office. Mr. Sadgrove had sent him to the tobacconists, to take his trousers and coats to the tailors, and his boots to the cobblers to be mended. That might have occurred ten or a dozen times in the two years he was in the office. He was of no use in taking out quantities, and Mr. Sadgrove had never expressed any satisfaction at any work he had ever done, nor had he received any encouragement. Cross-examined: He had

never written to the plaintiff making the complaint he had made then. The reason he remained with Mr. Sadgrove for two years was because he did not wish to create any unpleasantness between the plaintiff and his father. Since his father's death he had been studying architecture privately. Two or three days before he threw up his articles he came into an annuity, and he had not been earning any money since. Mr. John Coad, the defendant, and the uncle of the last witness, gave evidence as to an interview he had with the plaintiff, when the latter volunteered the statement to him that his nephew had better get out of the profession, as he was of no use. At the close of the evidence Mr. McCall said that he could not further deny that there had been a breach of the agreement on the part of the defendant, and then addressed his Lordship in mitigation of damages. His Lordship, in giving judgment, said that he came to the conclusion that the plaintiff had done his duty to young Coad. He had a large business, and gave him an opportunity of seeing that business. He was of opinion that at the close of the second year young Coad was of a great deal of use to the plaintiff, although Coad had invited him to believe that he was next door to a block-head, and of no use at all. He considered that Coad had learnt a great deal during the two years he was with the plaintiff, and he could not but feel that the young gentleman had given him an unreliable account of his own capacities. He felt compelled to say that the damage the plaintiff had said he had suffered appeared to be absurdly exaggerated, there being no evidence to warrant the plaintiff's statement that Coad's services were worth £250 a year to him. He thought that justice would be done by giving judgment for the plaintiff on the claim for £55, and also for the plaintiff on the counter-claim, with costs. Judgment accordingly.

**ACTION AGAINST SURVEYORS.**—WRIGHT V. DRIVER AND CO.—In the Queen's Bench Division on Wednesday, before the Lord Chief Justice and a Special Jury, this action was tried. The plaintiff, Mr. Fitzherbert Wright, as the surviving trustee under the will of the late Mr. Francis Wright, claimed damages against Messrs. Driver and Co., a well-known firm of surveyors and estate agents, for acting recklessly and improperly and for not using reasonable skill, care, and caution in surveying and valuing a certain property known as the Coombe Hill Estate, near East Grinstead, the plaintiff having employed the defendant firm to value the property in question and to certify the amount the plaintiff, as trustee, could properly lend on the estate, having regard to the provisions of the Trustee Act, 1888. The defendants denied that they had been negligent, or that they had failed to use reasonable care and skill in making their valuation. In the latter part of 1891 the plaintiff, as trustee, desired to find an investment for a considerable amount of trust money belonging to the estate of the late Mr. Francis Wright, and put the matter into the hands of Messrs. Fox and Thicknesse, solicitors, who acted for him with reference to the trust estate. In January, 1892, a Mr. Gasson, an auctioneer, hearing that Messrs. Fox and Thicknesse had clients who wished to advance money on mortgage, asked whether they were willing to advance £15,000 on the security of the Coombe-hill Estate, near East Grinstead. Gasson informed them that he had agreed to buy this estate for £12,000, but that he had further agreed to sell 150 acres, out of the total of 230 acres, to a builder named Jennings for £15,000. Messrs. Fox and Thicknesse put the matter before their client Mr. Wright, and Messrs. Driver and Sons were employed as valuers to report on the property. Messrs. Driver valued the estate at £25,000, but recommended that the trustee, considering the then rental of the estate, should not advance more than half that amount on mortgage of it. Relying on Messrs. Driver's report, the trustee authorised the advance to be made. The scheme for carrying through the negotiations was subsequently slightly altered, but being submitted to Messrs. Driver was approved by them. On April 13 the transactions were carried out—viz., the completion of the purchase by Gasson, the conveyance to Jennings, and the mortgage to the plaintiff. The estate appears to have been valued on the basis of its being a potential building estate. However, Jennings and another builder became bankrupt, and the plaintiff had to advance further sums of money to endeavour to develop the estate. Subsequently the plaintiff took possession of the property, and endeavours were made to sell it, first privately—but not an offer could be obtained—then by public auction, a reserve of £18,000 being put on it, and then no bid was made. The matter was left in the defendants' hands till February, 1895, and subsequently, the trust estate having suffered heavily by reason of this property, this action was brought against Messrs. Driver on the ground that they had very much over-valued the property. Valuers having been called to prove that the estate was not worth more than £11,000 or £12,000, counsel consulted together, and Mr. Jelf, Q.C., for plaintiffs, said he was happy to say that the case had been settled, the defendants having offered very fair and liberal terms, and he was very glad to be able to withdraw all charges of negligence against them.

## Our Office Table.

THE trustees of the famous 15th-century group of almshouses at St. Cross, near Winchester, have, after long deliberation, arrived at a design which will be generally approved. While they adhere to the proposal to increase the number of inmates in the hospital, and for that purpose to take the present master's house and build a new one; they have, after conference with the Charity Commissioners, resolved that the new master's house is to be built, not in the ancient precinct, but outside of it, on a site which will not bring it into conflict or contact with the unique and charming Mediæval group which have made St. Cross famous throughout the world.

THE total destruction on Sunday of the fine parish church of St. Mary and St. Lawrence at Bolsover, near Chesterfield, is a loss to English architecture. As usual, the calamity is attributed to the overheating of the new warming apparatus which was under the vestry, where the fire broke out. The church was a large doubled-aisled one, with western tower and low broached spire, and contained examples of every style from Norman to Late Perpendicular. The loss is complete, for nothing but the outer walls are left of the building, with the exception of the Cavendish Chapel and its costly monuments. The arcades and their columns, the chancel screen, pulpit, windows, monuments, and memorial tablets, and even the brass lectern, have suffered the same fate as the seating and roofs. The tower is so injured that it will have to be rebuilt. The church was insured for £3,150, the amount having been doubled only a few weeks since; but the pecuniary loss will considerably exceed £10,000. A temporary iron church is about to be erected, and the Duke of Portland has started a restoration fund with a subscription of £1,000.

At a general meeting of the Society of English Artists, held at the Regent Gallery, Regent-street, the following resolution was passed respecting the title of the Society, to which the Royal Society of British Artists had raised an objection:—"That there is no legal obligation on the part of the Society of English Artists to change the name as suggested in the letter received from the secretary of the Royal Society of British Artists, as there is no infringement of title, as alleged; at the same time there is a feeling that the similarity of names is objectionable, and, therefore, we, as a young society, are desirous of meeting the wishes of the older body, and with this view it be resolved to alter the name to the Society of English Painters."

A WELL-ATTENDED meeting of the timber trade of the United Kingdom was held on Monday at the hall of the Carpenters' Company, for the purpose of forming a benevolent society for the timber trade in celebration of the Queen's long reign. The chair was taken by Mr. E. J. Morgan, who was supported by Mr. W. L. Foy, Mr. C. Churchill, the Hon. C. Lawrence, Mr. C. Bird, Mr. C. J. Wade, Mr. H. H. Green, Mr. T. Stevenson, Mr. A. Raffety, Mr. G. L. Renton, Mr. W. H. Rider, Mr. B. G. Elliott, and Mr. T. Gabriel. The first resolution, pledging the meeting to promote the speedy formation of the Timber Trades' Benevolent Society, was proposed by Mr. C. Bird, the initiator of the movement. Mr. Bird pointed out that the timber trade was one of the few trades that had no benevolent society to help the poorer members of the trade in times of need or distress. The object of the meeting was to remedy that state of affairs, and he was pleased to be able to say that the idea had excited a considerable amount of interest, nearly £3,000 having been already promised, either as donations or annual subscriptions. The proposed charity was to include in its scope the whole of the United Kingdom, and promises of support had been received from many of the largest firms in the provinces. A draft scheme had been drawn up, which, if approved of in principle by the meeting, would be submitted to a committee for consideration. Mr. C. J. Wade seconded the motion, which was carried unanimously. Mr. W. L. Foy was elected as the first president of the society, Mr. E. J. Morgan was appointed treasurer, and Messrs. Bird and Wade undertook the duties of joint honorary secretaries. A representative committee was appointed to consider the scheme and to report to a general meeting of the subscribers.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### THE PERCENTAGE PRACTITIONER.

IN these days, when every profession is made up of workers and students, when the art student and literary critic are as much in evidence as the practical artist, it is somewhat hard to say which has the greater claim. In the profession of architecture, those who build have, at least, this advantage over their less active members, of being able to put into practice their art, and to receive a better remuneration for their services. The artist who only transfers his ideas to paper may display a higher and more competent knowledge of his profession, but is unable to realise his ideal creations, except as a "ghost" to some more favoured brother. We suppose this always will be so in the present conditions of architectural practice, where practical qualifications and theory are separate matters, and artistic skill is paid for by commission on the cost of the work.

Men of the percentage class who make headway in the profession and amass fortunes form the staple of institutes and societies, but differ widely from those who are more frequently in evidence as authors and critics. The latter become members of committees on education, and talk much about art, archæology, and criticism. We often wonder on what common ground Mr. Commission Smith, who is making money fast at his profession, can meet Mr. Artistic Jones at the same assembly, and with the object of furthering some professional or artistic object. They seem so far apart in their ideas and tastes. One is all building, his head full of contracts and specifications, his surroundings are amongst practical builders, and committees, balance sheets, financial accounts; how can he be in touch with men whose whole atmosphere is one of art, literary work, and researches? There must be a sort of organised hypocrisy in such a medley or interchange of opinion or thought. It cannot be. How can Mr. Smith, who is, above all, a practical builder, sit in committee with Mr. Cultus on a question of Greek refinement, or on a subject like the restoration of, say, St. Mark's, or even discuss the subject of examination in art. The thing is preposterous; yet Mr. Smith has made a name by being the leading specialist on workhouse building or asylums, and has built more from his designs than all the rest put together, and so he is put on the said committee as a matter of courtesy. No one denies him the right; he is an architect—aye, more than many who are called to deliberate, for he does know what building means, whereas many who take the title of architect are only so in name. All the same, he is not a critic, and is not necessarily an artist, and is therefore incompetent to judge of the subtle beauty or delicacy of any refinement in Greek or any merit in Mediæval work. Nor can he fairly appraise, except in a practical sense, a work of restoration. And it is with such hostile elements as these that architecture has to be made. How can men of such opposite trainings ever agree to any scheme of architectural education, or formulate the questions to be set to students? But the modern method is to mix them together; for the practicals to set one sort of questions, the literate of the profession the other sort; but there can be no sympathy or honesty between them. The two-foot rule and a bill of quantities cannot gauge the condition of artistic or architectural creation. A writer has observed with much truth that the

"value of a work of art can only be estimated by attempting to view it in the spirit of its inception and creation." An unsympathetic estimate is useless. How can a man who has been brought up amidst building operations, to judge of the qualities of bricks and mortar, or timber, fairly estimate a nice point of design? A distinction must be drawn. We do not put in the same category men like the late Sir Gilbert Scott, Sir Charles Barry, Mr. Street, or even our modern Pearsons, Norman Shaws, or Jacksons—men who have large practices both in building and designing. The percentage architect is one who chiefly confines himself to buildings of little pretensions to architecture, to business premises, workhouses, asylums, baths, factories to large contracts where the materials and workmanship are plain but heavy. They are, after all, the most remunerative class of buildings for the professional architect who is not ambitious for architectural fame. Yet these are the men who make up the backbone of the profession, and who by their executed works make architectural history. And it is therefore well if we do not underestimate the different methods they pursue to those of the art-architect and the literary critic. It seems to us that all that we have been troubling ourselves about of late, the history of styles, art criticism, architectural education, technical training, and what not, is so much wasted effort when men who ignore all these things as superfluous accomplishments are at the top of the tree, and are making large fortunes. These men are doing when their learned *c confrères* are only discussing and talking about the profession. They are making a lucrative business in this country and America in rearing colossal buildings, making large commissions on engineering contracts for iron and steel construction, much of which they do not care to trouble about. While the student in our college is learning the theory of the strength of structures, reading treatises on the mathematical principles for finding the crushing resistance of columns and the resistance to bending of beams, hundreds are actually employed in carrying out iron and steel structures who have never read a mathematical treatise in their lives. Men of this stamp are making large percentages in the States on "tall office buildings," the cost of which is mainly sunk in expensive foundation work, in sinking caissons, piers, grillages, and in constructing elaborate superstructures on the "steel cage" system. The architect is only general supervisor, but gets his commission easier than the man who sits down and designs every inch of stone or brickwork. So it is with other ranks—clerks of works and foremen; some are studious, others active. The former make themselves proficient in the theory of the trades. They attend technical classes at the Polytechnic, at Finsbury, or at the City and Guilds of London Institute; the others are actively employed. While one is cramming his brains with arithmetic and applied science, his less educated but practical brother occupies a prominent place on a building, perhaps condemning cartloads of material and badgering a whole host of workmen.

Is there not also a difference in tactics between the architect who makes his profession a means of yielding large percentages and of the man who looks for remuneration by the quality of his work? The first seeks to secure large and easy contracts, those that do not entail much personal attention to detail. To this end he delegates his authority. With the percentage architect the contract is an important factor; one that retains all the power in the architect's hands, makes him sole arbitrator in disputes. The chief thing about it is that a good deal of trouble is taken off the architect's shoulders: the contractor is responsible for all details. On the contrary, the architect with an artistic tempera-

ment prefers to have a freer hand in manipulating and checking his design. He likes to see his detail drawings carried out; to be in touch with artists; he visits workshops and studios, and for this reason separate contracts are more to his taste. But the labour and mental effort are increased tenfold; there is more worry, and the employer seldom thinks more of his architect for his pains. There is more satisfaction, no doubt, but less profit. The employment of separate plumbers, iron-workers, plasterers, modellers, and decorators means extra labour in preparing agreements. But the men of this school advocate direct employment—a system inimical to all one-man contracts and architects' commissions. The nineteenth-century architect is a creation of a new era of designing buildings; he is paid by percentage on cost, and it would be a wonder if commission was not the measure of his artistic effort. Our space does not allow us to notice the influence of the system on art and the crafts. The average practitioner goes in for large contracts because they pay better, and because they do not entail architecture or artistic skill, which means all work and mastering a lot of detail. He is wise, of course. He lets his artistic and literary friends pick up all the crumbs that fall from his table; the design of furniture and woodwork, glass, or any of the artistic odds and ends of decoration and of criticism. He can afford to be generous, for these works imply all skilled labour and little remuneration. And what is the kind of architecture which the commission-on-cost system has developed? We see it in our streets, our shops and commercial buildings, our municipal, poor-law, and sanitary buildings, in our newly-developed building estates; it has the very stamp of commercialism upon it—neither motive nor life in it. Cost, but not labour, is the watch word. Troublesome details must, therefore, be avoided. The outlay is most lucratively made up of heavy foundation work, massive walls of plain brick or stone, floors of thick timbers, iron, and concrete, and plain trussed roofs, or of repetitional ornament. What there is of architectural detail must be of the stereotyped order, duplicated arrangements, a multiplication of machine-made fittings and details—for this is the best-paid labour.

The principles of the architect who works mainly for percentage commissions are strangely at variance with those which the leaders of the profession have adopted as their own. One of these is the study of a style, not so much in its literal detail, as in the method and spirit adopted by the builders who built in it. The average architect talks glibly of "styles," and reproduces them with more or less minutiae—never honestly. He has never yet learned to understand that he can be faithful to one style, say Gothic, without ever copying a single feature. Nor has he ever learned what honest workmanship means when he accepts the stock-in-trade machine-made joinery, or receives a tender for supplying a thousand sashes and frames of a given size and design.

### OWNERSHIP OF DRAWINGS, AND THEIR SUBSEQUENT USE.

WHEN a client employs an architect to make plans and obtain tenders for a building not to exceed a certain amount, and he abandons his intention of building because the tenders exceed that amount, paying his architect the usual commission on the lowest tender, are the drawings made his? Can he, if he afterwards obtains a suitable tender, and gets a builder to do the work, call upon the architect to supply the plans without further remuneration? The Courts of law have practically decided the first question. They have held that, in spite of what has been argued as to the custom of the profession that an architect is paid for



the use only of the drawings, which remain his property, the client who pays for the plans has a right to them. Yet, notwithstanding this decision, unsupported as it is by other rulings, there is a strong opinion amongst architects, as well as lawyers, that the client is not justified in using the drawings, if he afterwards decides to build himself, to his own advantage by building, say, a number of villas from the same design. What is more repugnant to the architect and professional mind is the thought of the client so possessed of the plans handing them over to a friend who contemplates building, thus depriving the architect of his ideas at a very low remuneration, as well as of any opportunity of being employed. It is adding insult to injury. The design, of course, is akin to an invention. It represents not merely the architect's labour, but mainly his ideas, and why should he not have a copyright in his own conception? The question is, therefore, of a twofold significance to the profession—namely, not merely the right of the client to retain the drawings, but also his right to use them in any way he likes. If the law declares the plans to belong to the client, it can hardly give him the right to use them or hand them over to another party. This is a point which is at least very doubtful, but is of the utmost importance to the profession. Of course, it may be argued that if the law vests the property of the drawings in the client, it follows that he can make any use he likes of them. This appears to be the logical consequence of ownership. Our second question appears to be dependent on this point. The architect who has received remuneration for his plans, which have not been carried out under his supervision, can be called upon for the plans (if they are still in his possession), should his client find a tender within his limit. A case of this sort has lately been heard in the Westminster County Court. The plaintiff, an architect, according to the report, made plans and obtained tenders for two cottages, which the defendant wished to build at a cost not exceeding £400. As the tenders were all too high, the defendant refused to build, but paid the usual remuneration to his architect—viz., 3 per cent. on the lowest tender. A few years elapsed, and the defendant asked for a fresh tender, and the plaintiff made some slight alterations in the plans. He suggested to the defendant that a builder be employed to do the work under the control of the district surveyor without the supervision of an architect, in which case he would charge the builder two guineas for a set of tracings. Though not agreed to at the time, defendant afterwards accepted the offer of a builder to erect the cottages for the amount named. The defendant thereupon applied to the plaintiff for the plans and specifications, and the latter supplied copies and claimed two guineas, which the defendant declined to pay, as he had paid the plaintiff for the drawings, which he claimed as his property. An action was brought by the plaintiff, who at first limited his claim to two guineas for making alterations in the drawings and specifications; but these alterations were unsubstantial, and there was no promise by the defendant to pay anything for them. The claim therefore failed. According to this statement of the case, the plaintiff claimed only for making alterations to the plans, and not on the ground of ownership of the drawings. The decision only endorses the previous legal rulings, and shows that if plans have been paid for by the usual remuneration, even if the architect retains them, he can be required to give them up to the employer should he find a builder to undertake the work at any future time. The decision is undoubtedly awkward for the profession, but is important to be remembered. The usual idea entertained by architects in such circumstances is that, should the client eventually

agree to build, he will be bound in honour to employ the architect who prepared the plans, and pay his further commission for superintending the work. But this result does not seem to follow as a matter of course. If the architect retains his plans and specifications for abandoned work, he is still responsible to produce them when called upon to do so, if he has received his usual commission. A difficulty might arise if in the meantime the documents had been destroyed or thrown away as useless. We must wait for other legal decisions before the subject in all its many bearings can be cleared up. The architect's case has not yet been fairly dealt with by the law. His work, whether of the nature of plans or designs of an artistic character, or specifications, is looked upon at present as so much produce, or as tradesmen's goods, purchased by the employer when he pays remuneration, and, therefore, his property. Of course, as long as this ignorant and unappreciative view of the architect's skill and work is held by lawyers, we cannot expect the public employer to know any better, and the profession will be themselves to blame if they do not take steps to protect themselves by agreements with their clients. At one time, architects fought for the retention of their drawings, as if that covered everything; but we are occasionally reminded that custodianship is not the only thing. There is the liability to supply them, or copies of them, to the employer, or, as far as that goes, to any future claimant. Of course, we can imagine a set of plans being used in this way for buildings under different conditions and far away, or builders getting hold of tracings of a design and making use of them on various estates, and to the discredit of the author's work. All these and many more possibilities could take place, once the admission is made that a client who pays for a design can use it when and how he likes. It is the reuse or misuse of the architect's design that the profession has to guard against. What, for example, would be thought of a man who, having obtained a prescription for a certain malady, gave it to friends for other ailments? The medical practitioner would strenuously protest against such a misapplication of his professional skill, and it would be hazardous to those who made use of it. The misuse of medical skill would be sure to bring a speedy retribution; in the case of the architect's design a similar result might follow; but it would be less speedy, and the author would suffer more from the stigma than the physician, for his drawings are more transferable than a medical prescription. A plan can be modified to suit another site; but the design as a whole can be copied so that the architect is in a worse position, and would be a greater loser by misappropriation. The ordinary client is a man who likes something tangible for his money; he is generally a man who has made money in speculation or trade, and has a keen eye to the main chance. He thinks if he has had to pay a commission for plans and specifications he had better make the most of his bargain, and so if he cannot utilise the design in the ordinary course, he fancies he is quite justified in making use of it in some other way. At the same time he does not consider that he cannot make similar use of his lawyer's advice or legal documents, should they not be required, nor is he able to apply medical advice. The architect, he imagines, stands on another footing altogether; his plans or designs are so much paper value for money, which ought to be utilised. It is a pity the client cannot bring himself to think that what he pays for is the skill of his adviser only, and that, like a defendant in a recent case, agree that his architect's remuneration should be assessed on the basis that he should retain the drawings, and that he (the employer) should make no claim for them.

#### THE SOCIETY OF ARCHITECTS.

THE monthly meeting of the Society of Architects was held at St. James's Hall, Piccadilly, W., on Thursday evening in last week. The President, Mr. Robert Walker, J.P., of Cork, occupied the chair, and there was a good attendance of members.

#### RESTORATION.

Mr. THACKERAY TURNER, secretary of the Society for the Preservation of Ancient Buildings, read a paper on this subject. After some preliminary remarks, the lecturer said he should treat his subject under three heads—firstly, the definition and history of Restoration; secondly, the practices of Restoration; and, thirdly, the effect of Restoration upon the artist and his art. Now, continued the lecturer, the original meaning of the word "Restoration," and, as I take it, the true meaning, is "putting back or replacing something that has gone." It seems to me that restoration has, of late years, come to have a new and entirely different meaning, namely, "the making of new imitation work to take the place of that which is missing," and in this sense it applies to pictures, sculpture, architecture, and furniture. But, as applied to architecture, it means the building up with new materials those portions of a building which are missing, in imitation of the old. The new meaning of the word "Restoration" is generally confined to works of art. The restoration of pictures and sculpture has long ago been condemned, and the authorities of the National Gallery and other places do not now allow a torn or damaged picture being made good; but at one time it used to be a common occurrence to patch up old and damaged pictures and sculpture. Eminent sculptors used to be employed to make new parts to be fitted on to statues which had lost some one or other of their features. About the middle of the 18th century, Gothic architecture began slowly to revive, and to gain a hold upon the tastes of the people, who seemed to look upon it as something old and quaint. The first attempt to reproduce Gothic architecture occurred at the end of the Renaissance period, and the movement began to work actively about the beginning of the 19th century. A strong impulse was given to the revival by the Camden Society. Before the formation of this society men had been studying the Medieval buildings and architecture, and had divided it into five styles. No sooner had all this knowledge been acquired than the desire arose to have all our churches in one style. Each one of the styles came into fashion in its turn. Now as to the practice of restoration, I think we must make up our minds as to what we are aiming at. Are we aiming at strengthening and beautifying, or at strengthening only? We must, in the case of a church, render it fit for its holy uses; but I fail to see that the sort of "restoration" now in vogue makes a building any the more fit for Divine worship. In an old church there are associations which create veneration in the worshippers; but that is all destroyed if the church is "restored" according to the present fashion. I find at the present time that many architects do not restore, but only repair. When an old wall is tottering, do what you can to prop it up; but if you suppose that you can take those stones and from them build a wall which will look well, you will be disappointed. Try as you may, you will never succeed in making new work look like old; a real imitation is impossible. If the old original work is in existence, I would sooner have it than anything else. One form of copying is to make new work of the same design as the old, and I have seen "restoring" builders put a saw-cut through old mouldings which were perfect, in order to get the correct section. I will now give a few examples to show how hopeless it is for the purposes of restoration for this copying to be ever a success. The painter puts his copy alongside the picture he is working from, and he has every chance of making his copy like the original. The architect is generally, we hope, an artist too, but he sits in his office and makes drawings. The architect employs a builder to whom he gives his instructions; the builder employs a clerk of works who receives them; he, in turn, passes these instructions on to the foreman, and the foreman delivers them to the workmen to carry out. The architect is quite as much an artist as the painter, yet the work which he produces is done by workmen whom he despises, and who are looked upon as mere "hands." I will now show how an architect into whose hands the restoration of a



church has been placed should set about his work. He will, first of all, trace out its history and growth, though this knowledge is not essential; but he should thoroughly understand any structural movements which have been, or are, taking place. The foundations of ancient walls should receive first attention. The walls are often being harmed by damp. This dampness may sometimes be cured by a surface drain, or an eaves gutter; while an old wall may often be eased by a buttress. It is hardly wise to remove the plaster from the inside and outside of the walls. With regard to the painting of the interior walls, there was once a very good material called "whitewash" which served its purpose admirably, but no one would think of using it now under any other name than "distemper." I have seen a number of ancient churches ruined artistically by having all the old glass taken out and modern glass put in its place. Paving is a most important consideration in a church, and perhaps the best is plain stone. Hardly any pavement can be everlasting, and if it becomes worn and uneven, I would recommend its being taken up and relaid on concrete, in preference to new and costly paving with glazed and coloured tiles. Cast-iron gratings which cover the heating pipes are also an annoyance, and generally of a horrid pattern. It is very important that a thick bed of dry rubble should be put under the concrete when laying pavement. It seems to me that ancient work is not spoilt by modern work which does not pretend to be ancient. One reason why people do not go into a "restored" building is that the effort required is so great to find out what is old and what is new. I think it unreasonable to remove an ancient wall if it can be in any way propped up and spared. If only a few stones were decayed, the usual way would be to cut out the old and insert a new stone; but I should say, cut out the decayed part and half an inch more of the virgin stone, and afterwards make good with plaster. By this means the stone loses lin. by decay,  $\frac{1}{2}$  in. by cutting back, and the  $\frac{1}{2}$  in. are made good by plaster. This method will be found to be less costly than renewing the stone, and will save the wall. With regard to fractured ornamentation on Mediæval buildings, it should be left severely alone, as such imperfections are only the honourable scars of time. If people desire to complete the building, let it rest after they have completed it on paper. I must add one word with regard to Bath stone, with its 19th century dragged surface. Bath stone is cheap; but with its cheapness often goes that other quality. If one were building near Bath, it would be reasonable to use Bath stone, for an architect should always use the materials in the neighbourhood in which he is building. I knew a case of a well-known architect, who, when building in Yorkshire, specified Bath stone; and this stone was dragged from Bath, right the way to Yorkshire, and up to the top of a steep hill, passing, on its way, one of the best stone quarries in the county. A few words I must say with regard to roofs, and then I shall pass on to my third and last heading. Oak was for a long period the only wood used in England in the Mediæval ages. The use of sweet chestnut I regard as a myth. For testing old timber I am a firm believer in the use of the gimlet. Your attention is called to a certain decaying timber; you put your gimlet into it, and after it has penetrated a certain distance it stops dead, and nothing will make it advance further. Ancient wood becomes very hard, especially in the core; but oak, though very hard, is sure to decay if exposed to wet and atmospheric influences. I do not know whether the Mediæval builders were right or not in putting on span roofs without tie-beams; but we are certainly right in adding tie-beams to such roofs which show signs of weakness. Our wall-plates ought to be coupled by tie-beams or tie-rods. With regard to the coverings of roofs, slate is out of the question. I think it undesirable to use thatch, unless it be read thatch. Broseley tiles are almost as bad as slates: they are made too hard, too brittle, and too thin, and I am glad to see that hand-made tiles are fast coming into use. We have improved in hanging tiles by using the galvanised-iron pegs. The oak pegs, which were formerly used, often decayed, and either broke off, or shrank and fell out. A milled-lead roof is a poor thing. The lead is spoilt by milling, and the metal used is of inferior quality. Cast lead roofs, if laid properly, will last almost for ever. There are also copper and asphalt roofs,

and the latter, when composed of the proper materials, and laid according to the most approved plan, is the best and most durable roof in existence. I will now pass on to my third and last heading, namely, the effect of restoration on the artist and his work. To imitate old work in restoring buildings is to falsify history, and to debase art. All this copying has a most deadening effect upon artists. Men of the present should leave off copying, and do something original, as I feel sure they could do. If we copy, our copy must be not quite so good as that which we copy, and if this goes on and on, it is quite clear where we shall end. When we feel that the fetters have fallen from us, we may design in enjoyment, planning our buildings to meet the requirements we wish. Over all we must aim at truthfulness. And when the whole question has been thought out and fought out, and when our old buildings have been restored in a careful and conservative spirit, we shall probably feel that the buildings have attained an interest which no mere ornamentation has given them. I do not despise ornamentation, for ornamentation is the summit of architecture; but we can have architecture without it.

Mr. G. A. T. MIDDLETON, A.R.I.B.A., in proposing a vote of thanks to Mr. Turner, remarked that he had come there that evening prepared to disagree with almost everything Mr. Turner had to say; but instead of disagreeing he felt compelled to heartily agree with nearly all his views. Architecture was not so many styles: architecture was a growth, architecture was history, and in the stones that tell it they had a complete picture of the lives and characters of the people of the past. Where restoration was necessary, it should be carried out in as conservative a manner as possible. He thought that they would all agree with Mr. Turner in leaving the old work to tell its tale, and in putting in new work to tell its tale too, showing that what they put in was new, and not old. He felt that they should not copy the old too closely, but should let the new work be such as could only be produced in the 19th century. The 12th, 13th, and 14th-century builders put in work of their own times, and it was not uncommon to find a 14th or 15th-century door in the middle of a 13th-century wall. When it was necessary to put new work on an old building, it should tell its tale too. There were artists among them, and he thought they could surely produce good modern artistic work, but it need not be copied. With regard to the measures for repair, he thought that Mr. Turner was doubtlessly right in most cases. In putting a new roof on an old building, there was no reason why oak should be used exclusively; but pine, teak, and other woods were quite as good. Even an iron roof did not look out of place when artistically treated.

Mr. WILLIAM WOODWARD, A.R.I.B.A., seconded the vote of thanks, adding that he differed materially with the paper. It appeared to him that restoration was a question between the practical and theoretical. For the benefit of the artist they had either to let the building stand till it fell, or the practical architect had to be called in to restore it, and he thought Mr. Turner had made remarks which did not seem practical. Stones were not everlasting: they were subject to decay from the effects of the atmosphere, and new stones should be put in to replace the decayed ones. He did not see why Mr. Turner thought it better to cut away the decayed portion of a stone and make it good with plaster, instead of inserting a new stone. In one case the original stone would be gone, and in the other it would be hidden behind an inch and a half of plaster. With regard to the buttress, he considered it was not a sham, and held that, if people could not distinguish the difference between the new and the old, the substitution did not matter. When a buttress had been erected 50 years, it was very hard to distinguish it from the original. The lecturer had said it was wrong to make new work imitate old. Supposing a part of a Saxon or Norman church had fallen—the chancel, for instance—he wanted to know if Mr. Turner would restore the chancel in Queen Anne Style. Even to the artist that would be such an eyesore, that he would prefer the restoration to be in the original style. If such "restorations" went on, they would have in their cathedrals a conglomeration which was not good. He thought Mr. Turner had made a slip when he deprecated the use of stained glass. With regard to the paving of churches, it was obvious that it would not last for ever, and that when it was worn or uneven,

he thought it should be replaced by modern tiles. In the matter of cast-iron gratings, he would like to know whether Mr. Turner would put his heating-pipes under concrete! Mr. Turner had made objection to the pattern of these gratings, but they were absolutely necessary. With regard to copying being detrimental, that might be. They were architects who had to deal with bricks and mortar; but they were quite as alive to the beauty of the old work as the members of the Society for the Protection of Ancient Buildings or the Society of Antiquaries. Mr. Woodward here began a reference to Peterborough Cathedral, which the President ruled was outside the present paper, and the speaker said he would content himself by saying that the opinions of Mr. Turner were the opinions of a gentleman imbued with the love of art; but he had coupled with them the impracticable and impossible when dealing with bricks and mortar.

Mr. W. COOPER, in supporting the vote of thanks, said that he held, in the main, with a great deal of the views expressed by Mr. Turner, as well as with the practical remarks of Mr. Woodward. He had had much to do with the restoration of buildings in Kent, and he considered that the best course was to preserve the old as long as possible; but when a stone was crumbling away, it was best to replace it with a new one if the old one could not be brought forward to take its place. With regard to one church, he had found traces of Early English windows on each side of the chancel. He had also traced the exact shape of the windows, and he thought that when restoration took place it would be a sin to leave covered up those windows, which the original architect had intended to remain in his building. With regard to Broseley tiles, he did not consider them to be as bad as slates, but thought that they should use those materials of the present day which were better than those used in former times. The old style of tile, when saturated with water, had a deteriorating effect on the timber. Not only were the battens rotted, but the rafters had also become rotten through the porosity of the tiles. The water ran off the Broseley tiles.

Mr. G. HUSKISSON GUILLAUME remarked that he agreed with Mr. Turner in certain points, but he thought that they should draw a line somewhere between the leave-alone policy and the necessary repairs. He thought there was a great deal in what Mr. Middleton and Mr. Woodward had said. The worst evil of restoration was when it pretended to be the original work. Alterations need not be a mere copy or replica of old work, but a sympathetic treatment. There was no analogy between making the replica of a picture or the addition of missing portions to a statue and the restoration of old buildings. He thought the subject was one which they might have another meeting to discuss.

Mr. ELLIS MARSLAND, hon. secretary, said there were three points he wished to allude to. With regard to the analogy which Mr. Turner had drawn between the restoration of old statues and old buildings, he did not think the analogy held good. Old pictures and statues did not decay as old buildings did. If they could put their cathedrals under glass cases, it would be all very well; but as the buildings were exposed to the elements, they had to deal differently with them than with old pictures and sculpture. His second point was with reference to the rebuilding of an old wall. Mr. Turner had deprecated the rebuilding of an old wall; but when he came to the floor of a church, he had told them to take it up and relay it on a bed of concrete. He could not see where the difference lay between taking up an old floor and relaying it, or taking down an old wall and rebuilding it. And then, again, Mr. Turner had said that when they began to rework the surface of an old stone, that stone had ceased to be old, and had become a 19th century stone. Also he had recommended the cutting away of the decayed portion of an old stone, and making the face good with plaster. What object was there in keeping that stone 1½ in. behind the plaster? Surely, if they could do that, why could they not put in a 19th-century stone instead of 19th-century plaster? In the western portion of Amiens Cathedral there was originally a large rose window. In the course of time, and under the decaying influences of the elements, the window had fallen into decay. The 15th-century architects did not try to copy the old window, but had inserted a 15th-century window of their own design. He thought that if Mediæval architects did that, it was their business to follow in their footsteps.



The PRESIDENT said that while his position as chairman did not require him to make a speech, he had never before felt so tempted. He had a strong fraternal feeling towards another who held different views to himself, and had the courage to express them. He had great sympathy with Mr. Turner in the views that he held, for nothing had so exercised the human mind as that same subject of restoration. They must not forget that, because the lecturer differed with some of them, that their obligations to that lecturer became lessened—rather were they increased. They found, in their times, too much of the tendency of men who were lecturing, to say pleasant things, and to find out, if possible, what kind of views their audience held. A true lecturer, he considered, made them inquire into the base of their views, and to see whether they were true or false. He wished to express, on their behalf, the great obligation they were under to Mr. Turner, who had given them his earnest views, his strong convictions, who had made that subject a life study, and who had come there that night at certain inconvenience to himself to give them the benefit of the results.

Mr. THACKERAY TURNER, in acknowledging the vote of thanks, said that his sole object in appearing before them that night was that they might have their minds cleared up on the subject of Restoration. One speaker had referred to his treatment of stone. If a new stone was required, he would be the last to refuse it, but he would also put a brick in if he thought it would answer better than a stone. What they wanted was to have a building live as long as possible, and to tell its own history. It was not for the sake of saving the stone that he had suggested cutting away the decayed portion, and making good with plaster; but to save the wall. The patch of plaster was, in his opinion, less offensive than a newly-squared stone, and the amount of hammering required to get the old stone out and the new one in would certainly damage the wall. His society had given advice with regard to restoring the plasterwork in the tower of a church in Surrey, and the advice was followed. The old plaster which remained was left on, and the rest made good with new plaster. The effect was, that the church had been cared for. When old plasterwork was broken away, he thought that they should repair it. With regard to an eaves-gutter being a remedy to damp walls, they must remember that many old churches had eaves that projected 2ft. from the wall. If the water was carried off by a gutter, the ground near the walls would be dry, and there would be no water for them to suck up. He knew perfectly well that his schemes could be carried out, for his statements were founded on fact. With regard to Mr. Marsland's remarks on relaying an old floor and rebuilding an old wall, he had, he said, a great objection to taking up old pavement; but when that was the only course open, he would sooner relay it than replace it with modern materials. If anything could be done to keep an old wall up, he thought it should be kept up. With regard to Peterborough Cathedral, he thought that such buildings were their national property, and they should be treated in the best way. He had always had the greatest respect for Mr. Pearson, but he thought that the end might be gained without such severe measures. With regard to the specification Mr. Woodward had objected to and called impractical, he maintained that it was practical, and could certainly be carried out. Indeed, restorations on similar lines had already been successfully carried out by his society. What he did object to in the case of Peterborough Cathedral was the fact that the gentlemen who had said that the west front must come down had refused an opportunity to those who thought differently of examining the façade. With regard to Broseley tiles, it was very difficult to prove the qualities of one material or another. He considered that Broseley tiles were not thick enough and too easily broken, and they rattled in the wind. They were of a horrid colour, too, and this would never improve by age. Hand-made tiles, on the other hand, were more or less porous; but this defect was got rid of after a year or two. Another gentleman had said that in replacing an old floor, he would use glass mosaics; but he hardly thought that what was suitable for a modern building was suitable for an old one. Another gentleman had said that he did not see any analogy between piecing buildings and piecing statues. But the point was, they did not restore these statues, but only repaired them.

They should not "restore" the buildings, but they should repair them. He quite agreed that they should do all necessary repairs, but there they should stop. The Medieval builders did just what they pleased, and why should not they? He did not think they were adding a page of history to the building when it was restored after the present fashion; but he quite believed that the day would come when they would add history to their buildings, and when the time did come, he felt that they would have a style of their own.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting for the present session of the Royal Institute of British Architects was held on Monday evening, Mr. Alexander Graham, F.S.A., vice-president, in the chair.

#### NOMINATION OF ROYAL GOLD MEDALLIST.

The CHAIRMAN announced that the Council proposed to submit, subject to Her Majesty's gracious sanction, the name of Mynheer P. H. J. Cuypers, of Amsterdam, as the recipient of the Royal Gold Medal for 1897, on the grounds of his executed works as an architect. It was the opinion of the Council that this distinction should this year be awarded to a foreign architect. Mr. Cuypers had been the leading architect in Holland for the last fifty years, and if they looked at the various photographs and drawings of his works shown on the table, members would probably wonder how it was any other architect practising in Holland had had anything to do. The announcement was received with applause.

#### PETERBOROUGH CATHEDRAL.

The CHAIRMAN further stated that arrangements had been made for a special visit to Peterborough Cathedral, to take place on February 6th (to-morrow, Saturday). The applause with which the announcement was greeted quickly changed to laughter when the Chairman added that the party would be limited to thirty members, and that twenty-one members of Council and their friends had already announced their intention of going. At their meeting on the 18th January, the Chairman continued, the Council passed the following resolution: "That the Council, having fully considered the question of the restoration of the west front of Peterborough Cathedral, are of opinion that it would be inexpedient for them to take any public action thereon." This colourless declaration evoked a fresh outburst of ironical cheering and laughter.

#### SCULPTORS' ARCHITECTURE OF THE RENAISSANCE.

An address on this subject was delivered by Mr. ALFRED GILBERT, R.A., who remarked that he felt it would be presumption on his part to attempt to speak to architects on a subject which suggested so much, and on which he was, alas, so incompetent to descant. He knew that they would forgive him if his remarks merely conveyed suggestions for further inquiry. Could those great men whose names would presently be mentioned have heard all that should be said at that meeting, they would, he had no doubt, be filled with wonder and amusement at the pains which had been taken to reduce to theory the origin of their aims. Though they might possibly be grateful to the meeting for its appreciation of the realisation of their endeavours, they yet might entertain some concern at the thought that the most cherished gifts had been made out, explained, and proclaimed to the world as mere tricks of cunning. In the days when those great men lived, Art was quite young in her experience. Man, though as old as the age, was yet unborn as knowing or professing more than his personal knowledge. It was not an age of assertion, but of endeavour, yet not tentative, but as decided as the handwriting on the wall, and every bit as mystical, and for that reason it held us, it enchanted us, it allured us to inquiry. They had met that evening to discuss the work of sculptors of a past age. Surely the reason for this inquiry was, we recognised in certain work which gave us delight the distinct work of a class of individuals who, although cunning in the use of their tools, were yet not friendly with the cease-square and set-square of modern days. The astonishing thing was the apparent innocence on the part of the Renaissance sculptors of the things which we had grown to regard as indispensable. That the results of their inspiration and labours under such conditions should prove

so splendid as to create in us a desire to study these methods was refreshing, not to say restful, in these days of hurry. He was anxious that night to plead the cause of his revered predecessors in such a manner that the example might be followed by his living brethren and those who should come after. Sculptor-architects, architect-sculptors—where was the difference? and yet what a difference the transposition of these terms implied! If they added the magic word "Renaissance," the query he had raised was almost immediately answered. The sculptor-architect of that period still survived; but as for the architect-sculptor, his existence was not really a matter for inquiry. Probably he still existed, despite the fact that his efforts proved less of a phenomenon than did those of his fellow craftsman. The question arose: How came this so-called sculptor-architect into existence? At the period which was under consideration, despite a desire to create a national architecture, there seemed to have been but little attempt on the part of architects to realise anything beyond a free revival or imitation or adaptation of Classic models, and of these they possessed many examples. Sculptors, on the other hand, had fewer examples—indeed, most of those still in existence were Roman, and a few Late Greek productions. Sources of inspiration were, however, open to them in the study of Nature in all her suggestiveness and variety. At the time of the Renaissance, architects were hard at work as students of antiquity, striving to resuscitate the past; while sculptors, on the other hand, were yearning—burning in fact—to create and to give to future generations a true impression of their own lives and time. Was it to be marvelled at that, given such conditions, the sculptor of the Renaissance period should long for license and liberty, and a large field for his invention, and that he should essay to provide architecture as an accompaniment to his own proper work? Thus greatly enlightened, and stimulated by the vision of the possibilities of his art, the sculptor was led by his ambition to attempt the erection of the very forms he had been called upon to decorate. In short, he endeavoured to govern instead of being governed. This, in the lecturer's judgment, constituted the real origin of the most remarkable and significant phase in the history of the Renaissance. Since its inception, spreading as it did through Europe, and inspiring such works as were to be found at all the great centres of architecture, its good influence had been so manifest that he ventured to think that if greater attention could be paid to the study of the subject—if it could be brought into the ordinary scope of training of the architect and the sculptor alike—much good would accrue to both, and there would at length be some hope of the architect and the sculptor placing themselves in the position of those whom we admired and were disposed to imitate. It was not to be wondered at in an age of sumptuousness and magnificence, such as was that of the Renaissance, that the striving to excel should have become a passion, and that the ambition to build palaces to adorn should have taken the place of the former contentment to ornament palaces already built;—in fact, that the sculptor should have sought so far to combine his own art with that of the architect that he placed himself above the standard of decoration, and claimed to be the master-adaptor. Formerly the architect had been more confined to his own profession, to the spirit and traditions of the art of his predecessors, strengthened by an intense craving to create for himself. This, the lecturer had tentatively put it, constituted the origin of the Renaissance in its essence. He had endeavoured to trace the possible existence of the phenomenal sculptor-architect, in order that they might the more readily follow him in his observations as to his work. Mr. Gilbert explained that he was by no means prepared to claim for it a startling pre-eminence as directed simply to the creation of edifices: it was rather in the treatment of ornaments combined with purely architectural forms that he felt inclined to praise the sculptor-architect in his dual capacity. He had been accustomed to design and execute ornamentation for buildings in which he had no hand, and in which he had too often no sympathy. He realised that to his employer his ornament meant merely so much decoration, while to him it was the expression of an idea. This knowledge fitted the sculptor-architect for the task he was about to undertake, and which from many examples we knew he had fully mastered. They must not overlook a further and



very marked qualification the sculptor-architect possessed—the training he usually received in the art and craft of a goldsmith. Doubtless, to this training must be attributed the extreme freedom, the accuracy and delicacy of execution, the sense of colour and light and shade, and the fine appreciation of proportions which characterised their work. The lecturer said he was aware that, strictly speaking, the subject of his address would seem to promise a critical review of the work of the sculptor-architect; but it had seemed to him more fitting that it should be rather invited through discussion, than given as pronouncements from himself. He also considered that references to special works of particular sculptor-architects was more likely to serve the object in view, if it were made in the discussion, and therefore they would see that he had brought no illustrations, nor had he alluded by name to any of the great artists of that age. He would first urge upon young architects and sculptors alike, the desirability of the study of the phase of the art of the Renaissance period then under consideration. Such a study could not fail to impress them with the grandest lesson to be learned—that it was a duty every architect owed, not only to himself, but to his art and his generation, that he should aim at placing himself beyond the charge of being merely an imitator of the masters and styles of a past age; rather should he go to the root of the flower, and learn to create on its stem blossoms as beautiful as the originals. He should commence with the spirit, and not merely with the letter, of the age. He should worship it, and by bending himself to the application of its great influence, strive to pass on to posterity a rich legacy, further enriched by the imprint of his own time and his own individual advancement. Art was as young to-day as it was centuries ago; its existence was at once retrospective and progressive. Its every forward movement was a reflection sent back from the mirror of the ages, and its life was a constant reflection backwards and forwards in the mirror of the ages. Its future was written in the magic word “tradition,” a word which, in its right significance, would ever remain to assist art in its onward movement.

Mr. ALMA TADEMA, R.A., proposed a vote of thanks to Mr. Gilbert for his most interesting paper, which had been full of suggestions which made them dream of the beauties of the Renaissance and of the revival of the Antique, without giving them anything positive to disturb the general admiration of the beautiful things on which they had been feasting.

A long discussion ensued, in which Messrs. J. M. BYRDON, BERESFORD PITE, LENOX PRENDERGAST, H. L. FLORENCE, OWEN FLEMING, G. A. T. MIDDLETON, H. H. STATHAM, and the CHAIRMAN took part, and the lecturer replied at considerable length to the points raised.

## ADAPTABLE SPECIFICATIONS.—XXIX.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued).

**SHRINKAGE OF TIMBER.**—All timber shrinks after being felled; but if it is of good quality and seasoned, the greater part of this shrinkage will have taken place before the builder begins to use it. Shrinkage takes place, not in a haphazard way, but according to a general principle, and this principle is, that the further the wood is from the centre of the tree, the more it shrinks. Thus, if we suppose a plank, say, 4in. thick and 11in. wide, cut so as to contain the centre of the tree in the middle, both of its breadth and thickness, this plank will shrink pretty uniformly in width, but unequally in thickness, and will eventually be a little thinner at the extremities of its width than it is half-way between them. If a similar plank is then sawn off from the place adjoining this one, its thickness will shrink most next the edges, just as the previous one did, and for the same reason. But the second plank will, like the first one, also shrink in width; and here, unlike the first one, its two sides will shrink unequally. The first plank, which contained the pith or centre of the tree, had both its flat sides equally distant from that centre, and hence they would both have a tendency to shrink alike; but all planks which are cut on one side of the tree's centre, have one of their flat faces nearer to that centre than the other. The face which is farthest therefrom

shrinks the most, and the result is that all side planks tend to become convex on the side next the middle of the tree, and concave on the other side. It might be inferred from this that a plank with the centre or pith in it would make the most trustworthy work; but this is not the case. It is almost sure, on the contrary, to “shake” or split. This is a fault to which, from the particular way in use there of sawing up the trees, St. Petersburg deals are specially liable, as, in fact, are 4in. deals and planks in general. In practice, therefore, our best deals and battens for joiners' work nearly always have one of their sides nearer to the heart of the tree than the other, and so have some tendency to shrink unequally. But when the wood, as imported, is of high quality, and has consequently been well seasoned, this shrinkage will originally have been comparatively small, and it will have gone almost to its limit before the carpenter touches it. The exposure of a fresh surface to the air, which will be caused by planing and other operations, will contract it a little more—but only a little; and if the wood, after being worked, is allowed a reasonable time for this second shrinkage, it ought not to alter perceptibly after being placed in a building. Inferior timber, however, will go on alternately shrinking and swelling for a long period, as the weather is alternately dry and damp. After some years, it will probably reach a comparatively stable condition of permanent shrinkage; and contracts ought to be so drawn that even then, if he has not done it sooner, the carpenter who has undertaken to supply seasoned wood shall have to make good the defects in his own work and in other works which depend on it. A great many shrinkages in floor joists and partitions, and the consequent cracks in the plastering, result from the tendency of the modern builder to use “imported scantlings” instead of Baltic timber. These “scantlings”—that is, the planks, deals, and battens which arrive here already sawn into thicknesses, are softer and less resinous than good Memel or Dantziger logs. The consequence is, they absorb moisture more freely and part with it more freely, and so are in a perpetual state of expansion and contraction. In the long run, the latter force gains the day: the wall surfaces and ceilings crack, and wide crevices appear between the floors and the bottoms of the skirtings. The young architect will be told, perhaps, that these “imported scantlings” are “so much better seasoned than Baltic timber.” But there is no difficulty in getting well-seasoned Baltic timber. The seasoning takes time, and this to some extent affects the price; but where well-seasoned timber has been specified, well-seasoned timber should be supplied, and not stuff which may be suitable enough for joiners' work, but which is by no means the right material for structural carpentry.

*Sapwood*, often called, for shortness, “sap,” is, of course, the newest part of the wood, next the inner bark. Some builders will say that it is impossible to buy wood without it, which may be true; but (unless the architect insists on extravagantly large scantlings, which he is seldom tempted to do now that steel and wrought-iron girders have almost superseded wooden ones) there is no difficulty in removing the sapwood after it is bought. It has no strength worth considering, and an 11in. joist, for instance, with an inch of sapwood along one edge of it, is, for structural purposes, only a 10in. joist. If the sapwood is at top, it will shrink away from the floorboards, so that they soon get no proper bearing at that particular joist, and if it is at the bottom it will not properly or permanently hold the lathing nails. Wherever sapwood is subjected to damp it will decay, and the decay thus begun may spread to sound timber. Its dismal bluish, or sometimes greenish, colour will greatly detract from the appearance of any work in which it is exposed, and altogether the assurances of those builders who are so certain that “a little bit of sap will do no harm,” deserve to be received with a great deal of scepticism. Sometimes, it is true, a defect of this sort which is conspicuous to the view, may turn out, when examined, to be a mere discoloration, not a quarter of an inch thick, on one arris of a large timber. The safest plan, next to rejecting the timber, would be to chamfer off such a thin layer; but if that is out of the question, and the wood is destined for a permanently dry situation, little harm will be done by leaving it in. Everything in such a case depends on the position which the timber is going to occupy, and the custom is, to pass not too little, but too much sap-disfigured timber.

In joiners' work, unless the building is avowedly to be of the cheapest or most temporary kind, there is no excuse for putting in sapwood at all. Some of the worst things in which the joiner can put it are sashes and casements, sash and casement frames, and outer doors and door frames. “Most manufacturers,” says the *Technologist*, “seem to think it is allowable to work a bar or two of sapwood into a sash.” But, seeing that when the sapwood in a door or a sash has decayed, it will generally cost as much to patch up the sound part as to make a new sash or door, the sap-loving joiner might as well go further, and execute the whole thing in sapwood. He would thus make a larger saving in the beginning, while the proprietor would not have a larger loss at the end, for if enough of his door or his sash decays to make it worthless, it might as well all decay at the same period.

**Shakes.**—The inferior builder has generally an assortment of these on hand, and if he happens to run short of the natural ones, he soon produces factitious examples by allowing his timbers to be pulled to pieces (“opened,” as he mildly calls it) by long exposure to sun and wind. *Natural shakes* are those which exist in the tree before it is felled. They are not always conspicuous then, but show themselves more fully while the wood is being seasoned. They may usually be detected by looking at the ends of the log. Three main varieties are noted—*heart-shake*, *star-shake*, and *cup-shake*. Of these, heart-shake is the commonest. It may be described as a crack, or several cracks, all passing through the centre of the tree, and radiating more or less in the direction of the circumference. If they quite reached it, which they seldom do, their effect would be to split the trunk lengthwise into several sections. But without going as far as this, they entirely spoil the planks into which they extend, and make them unfit for use, except in the small spaces which happen to be between one shake and another. Sometimes a heart-shake does not run straight in the direction of its length, but twists its position at various heights in the tree-stem. In this case, it is even harder to deal with them than when it is of the simpler and commoner form. In heart-shake, the cracks are widest at the centre of the wood, and grow finer till they become almost imperceptible, as they approach the bark. The reverse is what happens in *star-shake*. Here the cracks begin at a distance from the middle, and grow slighter and narrower as they approach it. *Cup-shake* is quite a different thing. It is not a radiating crack, or a group of such cracks; it is rather a separation between two or more of the annual rings of wood which make up the trunk, so that they can be partially pulled away from one another, like the coats of an onion. The cause of shakes is somewhat of a mystery. Dantziger timber has the reputation of being tolerably free from them, while Riga, and especially Swedish logs, are affected by them badly. Pitch-pine is also frequently injured by serious heart-shakes. In all kinds of “soft wood”—that is, of pine and fir—the shakes are often almost imperceptible when the tree is first felled; but they darken and become more conspicuous as it dries. Timber with small heart-shakes in it—that is, with shakes which do not radiate far, and do not, therefore, approach the outside of the tree—is sometimes put aside for large girders and similar features, in which the shakes are never likely to show themselves on the outside. Even in such cases, however, they are far from being an element of strength, and, if passed in posts and pillars, may lead to serious failures.

**Dead knots** are unsightly and injurious in themselves, and sometimes indicate, too, patches of internal rottenness in a log which are not otherwise to be detected unless it is cut up. *Sponginess of the pith* at the lower part of a tree, and *injury by wormholes*, are also reasons for rejecting it. *Woolliness and roughness of the grain* are signs of inferior quality, and clear, bright-looking timber is always to be preferred.

**Decay in timber** originally sound is one of the main things to be guarded against in the superintendence of works. A free circulation of air is indispensable as a means of preventing this. Bedding the ends of beams in mortar, and grouting them over, are both injurious to the wood. To surround timber with coal-ashes or wood-ashes appears to be a sure way of destroying it, especially if, through the washing of the floors or other causes, the ashes are kept damp. A large building in Washington, which had only been completed two years, completely failed from this

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cause, as far as the floors were concerned, in April, 1891. The joists were for the most part 10in. by 2in., and of sappy Virginia pine. To the underside of these joists was affixed a ceiling of patent plaster blocks. The whole space between the joists was then filled in, for the purpose of fireproofing them, with a mixture of wood and coal-ashes. The top of this bed of ashes was plastered or cemented over, and on the cement was laid a flooring of marble slabs or tiles. This flooring was frequently washed, with the result that both the joists and the ashes seem to have been kept permanently damp! So matters went on for a couple of years; then a small section of an upper floor gave way, and, falling, crashed through floor after floor, till the accumulated rubbish arrived at the ground. It was found on examination that all the joists of these floors were in an advanced stage of decay. There was no appearance of fungus on them; they were changed into dry, brown powder—perhaps by the action on the wood of the potash so abundantly present in the wood and coal-ashes. It is said that the same kind of filling-in to floors has been also tried in New York, and that there, too, the ashes destroyed the timber.

*Dry rot* is in this country the most prolific cause of decay, especially in fir and pine. The wood affected by it darkens in colour, tending to a dull, yellowish brown, and at the same time it becomes much lighter than it was in weight. It then cracks and warps, doing the latter especially when one side of a timber only is affected. If the timber is damp, the diseased part becomes soft, almost like cheese; while, if it is dry, it can easily be broken to pieces, into fibrous lumps which can be powdered between the fingers. The diseased wood tends strongly to absorb and retain moisture from the air; and if a piece of it is placed in water, it sucks it in and quickly sinks.

## STABLE CONSTRUCTION AND SANITATION.—III.\*

### PRINCIPLES OF NATURAL VENTILATION.

ALL methods of natural ventilation—however much they may vary in the details of construction and arrangement—depend essentially for their proper working upon the more or less complete manner in which advantage is taken of the natural laws to which the atmosphere and other gases are subject. The two most important of these, so far as they relate to natural ventilation, are—

1. The law of gaseous diffusion.
2. The law of gaseous expansion.

With regard to the first-mentioned law of gaseous diffusion, it is now well known that all gases which, when brought together, do not combine to form a chemical compound have the property of becoming intimately mixed with each other, even though they are simply allowed to remain at rest without being shaken up. The rate or velocity at which different gases diffuse has been found to be proportional to their respective densities or weights. From experiment it has been ascertained that the velocity of diffusion of gases is inversely proportional to the square root of their respective densities. For instance, the diffusive power of hydrogen gas is four times greater than that of oxygen, the latter gas being sixteen times heavier than hydrogen. This property of gaseous diffusion is important, inasmuch as it tends to produce an equal distribution of the gases given off in the process of respiration; but owing to the comparatively slow rate at which the gases diffuse, it is totally inadequate in itself for purposes of ventilation.

The most valuable natural force which is utilised in the ventilation of buildings is that of gaseous expansion. Air, like all gases, increases in bulk when heated, and diminishes when cooled. The hot air as it expands becomes lighter, and ascends, whilst the surrounding cold air, being of greater specific gravity, descends to take its place.

The continual and varied movements of the atmosphere called *winds* are essentially due to the last-mentioned cause, and it is on this wind force, together with the air currents caused by the difference of temperature between the air of inhabited buildings and the external atmosphere, that the efficiency of any system of natural ventilation will chiefly depend.

In the consideration of wind force as a means

of ventilating buildings, the first thing that will be observed is the inconstant nature of the force available. At one time a strong breeze may be blowing, whilst at another period scarcely any motion is noticeable in the air. It has, however, been found that some movement is always present in the atmosphere, even on what may appear to the casual observer to be a perfectly calm day. The velocity of the wind may vary in degree from a hurricane moving at the rate of 100 miles an hour to an imperceptible air movement of one mile per hour. The average velocity of the wind in this country is from 7 to 12 miles per hour, and it will seldom be found to be less than four

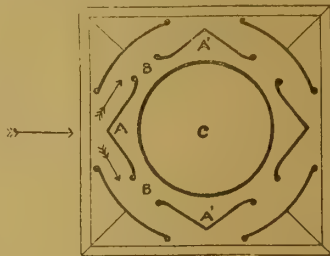


FIG. 9.

miles an hour. Advantage is taken of this continuous but variable wind-force in order to extract the internal air of the building by fixing some form of extracting cowl or hood on the vitiated-air outlets. For this purpose numerous descriptions of automatic exhaust ventilators have been devised and patented so as to remove the air of buildings by aspiration. Some forms of exhaust ventilators have revolving heads which actuate an Archimedean screw arrangement within the ventilator, whilst others are designed without any movable parts. The latter description—known as *fixed aspirating ventilators*—are now most commonly used. These essentially consist of a number of baffle or intercepting plates, so arranged that the velocity of the wind passing over and around the ventilator withdraws the internal air by creating a partial vacuum in the ventilating shaft, which is being continuously supplied with air from within the building.

Figs. 9 and 10 show the plan and elevation of the general construction for an exhaust ventilator with vertical baffle plates. The wind, on entering the ventilator in the direction of the arrow, is deflected by the baffle plate A, and in passing the openings BB, between the baffle plate A and the adjacent baffle plates A' A', with-

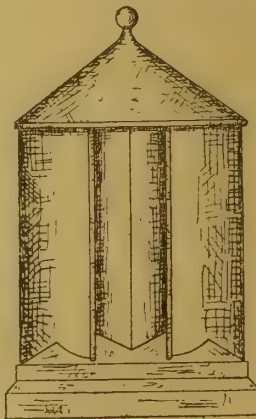


FIG. 10.

draws the internal air by creating a partial vacuum within the ventilating tube C, which is constantly being supplied with air from the interior of the building. In this manner the vitiated air is continuously drawn off by the force of the wind so long as the supply of fresh air to the building is being maintained.

A similar section and elevation of an exhaust ventilator with horizontal baffle plates or diaphragms is shown in Figs. 11 and 12, the principle of which will be readily understood from the explanation just given. Should any rain or snow penetrate the ventilator, it is collected in the safe or tray T, and discharged on the outside by means of the small pipe P, as indicated in the section (see Fig. 11).

A good automatic exhaust ventilator should, under favourable conditions, exert an extracting power of about *half* the velocity of the wind—that is, a wind moving at seven miles an hour, or about 10ft. per second, acting on an exhaust ventilator of good design, will extract the external air at the rate of 5ft. per second, provided that adequate fresh-air inlets have been fixed, and that no loss is incurred through excessive friction in the ventilation shaft itself.

The following table shows the velocity of various winds in miles per hour and feet per second.

TABLE OF VELOCITY OF WINDS.

Description of wind.	Miles per hour.	Feet per second.
Imperceptible .....	1	1.46
Perceptible .....	5	7.33
Gentle .....	7	10.26
Light breeze .....	10	14.66
Strong breeze .....	20	29.33
Stormy breeze .....	40	58.66
Gale .....	60	87.99
Storm .....	80	117.33
Hurricane .....	100	146.66

It now becomes necessary to consider the action of air currents caused by the difference of temperature between the air of inhabited buildings and the external atmosphere, so far as this variation of temperature may be brought to bear upon the ventilation of buildings.

In this country the internal air of inhabited buildings is almost invariably higher in temperature than the external air, owing to the heat thrown off in the process of respiration and from other causes. The internal and warmer air, being of lighter specific gravity, tends to ascend, whilst the external, colder, and consequently denser, heavier air—obeying the laws of gravitation—presses downwards to take its place. According to the laws of falling bodies—known as Montgolfier's "Law"—the velocity of a body falling freely from a state of rest constantly increases during the whole period of its descent. This acceleration of velocity is due to the action of gravity, and it has been found that a body starting freely from a state of rest will have acquired a velocity of nearly 32.2ft. per second at the end of the first second. This value or coefficient of gravitation is not strictly correct for all places, as, owing to the earth's form, the action of gravity varies slightly at different points of the earth's surface. Thus, at sea level in the latitude of London the coefficient of gravitation is found to be 32.191, whilst at Manchester it is 32.196, and at Edinburgh 32.203; but for all practical purposes it is usual to consider the value of the acceleration due to gravity as 32.2ft. per second. The general statement of the physical law respecting the velocity of falling bodies is as follows, viz. :—

$$\begin{aligned}
 V &= \sqrt{2GS} \\
 &= \sqrt{2 \times 32.2 \times S} \\
 &= \sqrt{64.4 \times S} \\
 &= 8.025 \sqrt{S}
 \end{aligned}$$

Where—

V = Velocity in feet per second acquired in falling through a given space.

G = Acceleration in feet per second due to gravitation = 32.2ft. per second.

S = Space fallen through in feet.

In order to obtain the velocity of the descent of the colder air—and conversely the rate of ascent of the warmer air—it is necessary to ascertain the vertical distance in feet between the fresh-air inlet and the extreme point of discharge of the foul-air outlet, together with the amount of expansion due to the difference of temperature between the internal and external air, and to substitute these values for S in the foregoing equation. From numerous experiments it has been ascertained that air expands .002 of its volume for every rise of 1° Fahr. in temperature.

Let *h* = Vertical distance in feet between the fresh-air inlet and the top of the foul-air outlet.

*t* = Excess of temperature of the internal air over the external air in degrees Fahr.

The equation then becomes—

$$V = 8.025 \sqrt{ht \times .002}$$

It will be observed that no allowance has been made in this formula for the great loss of velocity to which air currents are subject when passing through orifices or flues. For practical ventilation purposes it is therefore necessary to remember that the velocity of the air currents will be



greatly retarded by friction between the flowing air and the sides of the inlet or outlet flues.

In the construction of ventilating flues and shafts, the following points respecting the resistance offered by friction should be noticed, viz. :—

1. *The frictional resistance varies directly as the length of the tube or shaft.* For instance, the resistance offered to a current of air passing through a tube 10ft. long is twice the amount which would be obtained in a precisely similar tube 5ft. long.

2. *The frictional resistance varies directly as the square of the velocity of the air current.* Thus,



FIG. 11.

a current of air passing through a tube with a velocity of 2ft. per second will meet with four times the amount of frictional resistance which would be offered to an air current passing through the same tube with a velocity of 1ft. per second.

3. *The frictional resistance varies inversely as the diameter or area of the tube or shaft.* A tube, 3ft. in diameter, would offer one-third the resistance to that of a similar tube 1ft. in diameter, the velocity of the air current in both cases being the same. For this reason it is desirable that the air-way of exhaust ventilating shafts may be as large as practicable.

Ventilating shafts of circular section give the best results, as they afford the greatest area for the passage of air currents with the smallest amount of exposed frictional surface. It is also important that angles or bends should be avoided as far as possible, as the velocity of an air current is greatly reduced thereby. For all practical purposes it is found that every right-angle bend within a ventilating flue or shaft reduces the velocity of the current by one-half. Consequently a current of air having a velocity of 5ft. per second, on entering a ventilating flue with one right-angle bend, would (irrespective of any loss of velocity due to friction with the sides of the flue) be reduced to 2½ft. per second immediately after passing the bend, whilst with two right-angle bends the velocity of the current, after

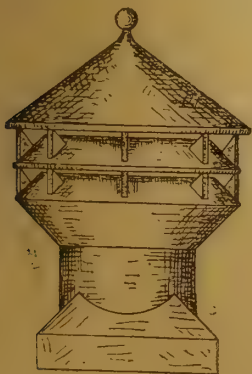


FIG. 12.

passing the second bend would only be about 1¼ft. per second, and in the case of three bends there would practically be no current at all, where the initial velocity was only 5ft. per second. The internal surfaces of the ventilating flues should be perfectly smooth, so that the loss of velocity due to friction may be reduced to a minimum. As a comparison, it may be mentioned that the velocity of an air current through a flue having rough sides has been found to be only half that obtained

in a flue of similar size and length when constructed with smooth internal surfaces. To obtain the most satisfactory results, all ventilating shafts should therefore be quite smooth inside, straight, and without any angles or bends. Where angles are a necessity, they should be well rounded. Even when these conditions are complied with as far as possible, a certain amount of friction, and consequent loss of velocity, is unavoidable. In order to allow for this loss of velocity due to friction, a deduction varying from ⅓ to ½ (according to the local circumstances of the case) is usually made from the results given by the foregoing formula. For ordinary purposes, the net resultant velocity thus obtained will be found to afford sufficiently reliable results for straight flues of average length and section.

Where more accurate results are required it is necessary to take into consideration the length and sectional area of each flue. The following formula may then be used with advantage, viz. :—

$$V = \sqrt{\frac{13 \text{ DHT}}{\text{D} + \text{CL}}}$$

D = diameter of flue in feet for flues of circular section, or—

= the square root of the sectional area of flue in square feet for square or rectangular sections.

L = length of flue in feet.

C = Coefficient of friction, varying for surfaces of different materials, or—

= .02 for clean-glazed earthenware pipes or flues.

= .03 for wood shafts or flues.

= .06 for flues coated with soot.

H = vertical distance in feet between the fresh air inlet and the top of the foul air outlet.

T = excess of temperature of the internal air above that of the external air in degrees Fahrenheit.

V = velocity of air current in feet per second.

The following table shows the velocity and volume of discharge of air inlets and outlets for various differences of temperature and height, as given by the previously-mentioned formula ( $V = 8.025 \sqrt{ht \times .002}$ ), after deducting one-fourth for loss by friction.

VELOCITY AND VOLUME OF DISCHARGE OF AIR INLETS AND OUTLETS FOR VARIOUS DIFFERENCES OF TEMPERATURE AND HEIGHT, AFTER DEDUCTING ONE-FOURTH FOR LOSS BY FRICTION.

Difference of level between fresh air inlet and foul air outlet.	Excess of temperature of internal air over the external air.	Velocity of discharge.	Volume of discharge per square inch of air inlet and outlet.
	Degrees Fahrenheit.	Feet per second.	Cubic feet per hour.
5 feet.	5	13	37
	10	2	50
	15	2½	56
	20	2¾	69
10 feet.	5	2	50
	10	2½	69
	15	3¼	81
	20	3¾	94
15 feet.	5	2½	56
	10	3¼	81
	15	4	100
	20	4½	119
20 feet.	5	2¾	69
	10	3¾	94
	15	4½	119
	20	5½	137
25 feet.	5	3	75
	10	4½	106
	15	5½	131
	20	6	150
30 feet.	5	3½	81
	10	4¾	113
	15	5¾	144
	20	6¾	163
35 feet.	5	3¾	88
	10	5	125
	15	6	150
	20	7½	181
40 feet.	5	3¾	94
	10	5½	137
	15	6¾	163
	20	7½	188

The average difference of temperature between the internal and external air may be taken at 10° Fahr. It will be seen from the foregoing table that a difference of level of 35ft. between the fresh-air inlet and foul-air outlet, together with a difference of temperature of 10° Fahr., would create an air current having a velocity of about 5ft. per second.

In winter, when the difference of temperature between the internal and external air would probably exceed 10° Fahr., the velocity of the incoming cold air would be proportionately increased, whilst during the hottest part of the summer, when the difference of temperature would sometimes be less than 10° Fahr., the velocity of the fresh air entering the building would be correspondingly decreased. Under these

circumstances, it is desirable that provision should be made so that an increased amount of fresh air may be admitted in the summer by means of additional ventilating openings (this may be effected by opening the windows); whilst in winter precautions must be taken to avoid the injurious effects which any unguarded cold draughts might have upon the horses, consequent upon the increased velocity at which the cold external air may enter the building.

## BUILDING TRADES EXHIBITION.

INTERVIEW WITH MR. H. GREVILLE MONTGOMERY, THE PROMOTER.

AFTER a lapse of two years another building trades exhibition is to be held at the Agricultural Hall. From the 20th to the 27th March the great building in Islington will be crowded with specimens of every conceivable kind of material that all the branches of the building trades call into use. Mr. H. Greville Montgomery, proprietor of the *British Clayworker*, is again promoting the exhibition, and he allowed a London representative to interview him on the matter.

"How will your coming exhibition compare with the previous one?" was the first query.

"It will be better," replied Mr. Montgomery; "better in every way. The exhibition of 1895 was, as you may remember, a distinct success, and as a matter of fact it was the only exhibition of the kind that paid in five years."

"Perhaps that is the reason you wished to make sure of the present one by waiting two years?"

"Well, personally, I don't think it advisable to hold these exhibitions yearly. The public gets tired of them, and exhibitors find it too expensive to send up every year. Alternate years, I think, meet the case very well. It allows time for the growth of new interest in the matter. That is evidenced by the widened interest in the present exhibition. Here, I find, two months before the exhibition opens, every available stand on the ground-floor already taken up, and further applicants must be relegated to the gallery."

"Is the Consultative Council as representative as before?"

"That, too, is larger in number and wider in its scope. We have sixty architects on the council, together with a number of other prominent men. Professor Banister Fletcher is again chairman, and with him are Mr. Blashill, the County Council's architect; Mr. G. F. Watts, the artist; and such well-known architects as Sir Arthur W. Blomfield, A.R.A., Mr. A. Waterhouse, R.A., Mr. C. Barry, and Mr. Rowland Plumbe. We have also some of the leading journalists of the trade papers. There are Mr. Kibblewhite, of the *BUILDING NEWS*, and Mr. Gilbert Wood, of the *Architect*."

As to the holding of trade conferences at the exhibition, Mr. Montgomery explained that arrangements were now being made for them. Possibly, three sections will be arranged, one for stonework, another for brickwork, and a third held under the auspices of the Association of Municipal and County Engineers.

"But our greatest feature," continued my informant, "will be the competitions in craftsmanship. We had a few such competitions on the last occasion, but they were limited to the last day of the exhibition. Our present proposal is to hold them every day. We have increased their number considerably, and, in addition to our own prizes, special prizes will be given by the Carpenters' Company, and the Bricklayers' and Tylers' Company, and two or three of the trade papers, such as the *BUILDING NEWS*, the *English Mechanic*, &c. All the conditions of the competitions have been drawn up by the Science Committee of the R.I.B.A. This same committee, in conjunction with representatives of the City companies and other bodies connected with the building trades, judge the work when completed, and we expect to get some distinguished man to award the prizes. On the last occasion, you may remember, we secured the services of the Duke of Fife."

"What subjects for competition do you propose to set?"

"We have drawn up eight distinct subjects, and, of course, there will be several departments in each subject. The set subjects will be masonry, bricklaying, carpentry, joinery, decoration, plastering, plumbing, smithing. The competitions are strictly limited to British workmen. We feel this necessary, although some of the



foreign firms in this country feel the limitation somewhat unjust. For instance, an Italian employer, engaged in mosaic work, called on me the other day and wanted me to permit some of his workmen, of his own nationality, to take part; but, of course, I could not allow that."

"Everything, then, points to a useful exhibition?"

"I think so. Already more firms have taken stands than we opened the exhibition with two years ago. What is better, more representative firms have come forward, and larger exhibits have been promised. It will be the most representative, and certainly it will be the largest, exhibition that has yet been held in connection with the building trades. We are charging a shilling admission up to six o'clock, and sixpence after that hour. Music, of course, will be provided in the main building. I might mention that we have offered a premium of £10 for the best design for a poster announcing the exhibition, one of the adjudicators being Mr. Seymour Lucas, A.R.A."

There is every prospect, therefore, that under Mr. Montgomery's able direction the exhibition will be very useful and successful.

#### SOCIETY OF ENGINEERS.

**T**HE first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, the 1st February, at the Royal United Service Institution, Whitehall. Mr. Samuel Herbert Cox, the president for 1896, occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. George Thudichum for his paper on "The Ultimate Purification of Sewage"; the Bessemer Premium to Mr. D. B. Butler for his paper on "The Effect of Admixtures of Kentish Ragstone, &c., upon Portland Cement"; the Rawlinson Premium to Mr. W. G. Wales for his paper on "Discharging and Storing Grain"; and a Society's Premium to Mr. M. A. Pollard-Urquhart for his paper on "Examples of Railway Bridges for Branch Lines."

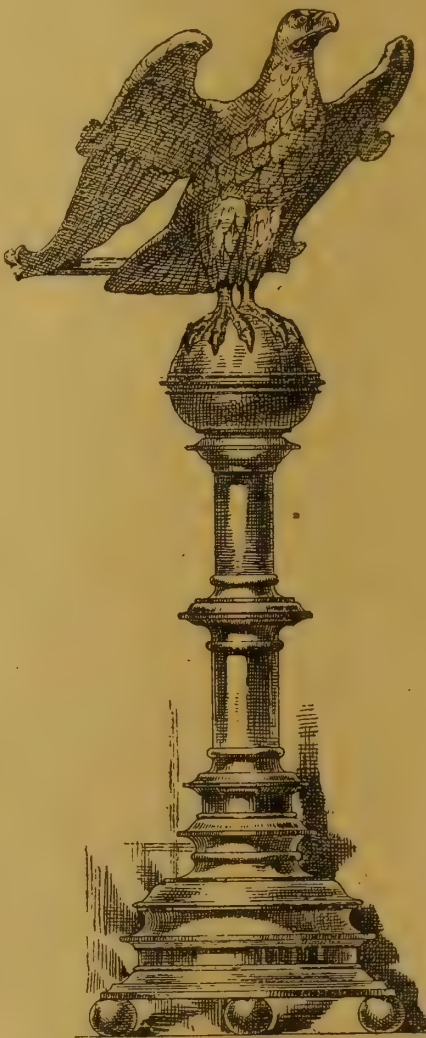
Mr. Cox introduced the president for the present year, Mr. George Maxwell Lawford, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year.

After briefly reviewing the work of the society during the past year, the President drew attention to the steady reduction in the general death-rate of this country during the last fifty years and the comparative freedom from zymotic diseases, both of which were attributed to the progress of sanitary science and the impetus given to the practice and study of hygiene by the Public Health and River Pollution Prevention Acts. The provision of pure water and efficient drainage was the duty of the engineer, and on these two subjects, which are of such vital importance to all communities, the President based his address. After alluding to the discoveries of Pasteur and the influence of biology in its relation to the purification of water, he contrasted the system of lake supplies, as instanced by the water undertakings of Glasgow, Manchester, and Liverpool, with the Metropolitan supply, which, coming from such polluted sources as the Thames and Lea, was entirely dependent for its bacterial purification on sand filtration. He further contrasted the successful municipal enterprise of the four cities mentioned with the working of the London companies, which are managed solely in the interests of the shareholders, finally expressing the opinion that the London supply should be managed in the consumers' interests by a body from which party and political feeling should be entirely excluded. A short description was then given of the Zurich waterworks, which he had recently visited, and which are of exceptional interest to engineers by reason of the striking example they afford of "the conversion of the great sources of power in nature to the use and service of man," the river flowing from the lake being utilised not only to pump the entire water supply of the town, but to generate both hydraulic power and electricity for lighting, motors, and traction. Drainage was then dealt with in its relation to water supply under the three headings of the house, the sewer, and the outfall. Special reference was made under the second heading to Mr. Parry Laws' and Dr. Andrewes' researches on sewer air and the organisms in flowing sewage, the conclusions arrived at tending to show that both sewer air

and sewage were hostile to pathogenic (or disease-producing) organisms. The third heading, the outfall, opened up the great problem of sewage disposal, and after again alluding to the important part played by bacteria in the purification of sewage, the President emphasised the fact that there could be no universal panacea for sewage purification, and that every case must be dealt with entirely on its own merits and with special regard to the local conditions and surroundings. Reference was made to sludge and its disposal, and to the generation of steam power by the utilisation of two hitherto waste products—sludge and domestic refuse in combination with the refuse destructor. In conclusion, the President stated that in his opinion no scheme of water supply could be considered complete unless it was supplemented by an efficient drainage system, and that by devoting their attention to the hygienic requirements of all classes of the community, engineers contributed their share to the health, and consequently the prosperity, of the nation.

#### LECTERN FOR WHIPPINGHAM CHURCH.

**A** HANDSOME brass eagle lectern has been presented to Whippingham Church by Colonel Lord Edward Pelham-Clinton in memory



of H.R.H. Prince Henry of Battenberg. We append an illustration. The inscription on the base, in red and black letters, is as follows:—"To the glory of God and in memory of H.R.H. Prince Henry of Battenberg, this lectern is offered as a gift to the Church of St. Mildred, Whippingham, by Colonel Lord Edward Pelham-Clinton. Jan. 20, 1897." The lectern was made by Messrs. Jones and Willis, 43, Great Russell-street, London, and Birmingham.

The Duchess of Fife, who was accompanied by the Duke, opened, on Friday, the new out-patient department of the Sussex County Hospital at Brighton, the foundation-stone of which was laid by the Prince of Wales in February, 1896.

#### INSTITUTION OF SURVEYORS.

##### STUDENTS' PRELIMINARY EXAMINATION.

**O**F the candidates who presented themselves at the Preliminary Examination of the Institution, held concurrently in London, Manchester, and Dublin, on the 20th and 21st ult., the following satisfied the examiners:—

Charles Henry Alderson, Eamesscliff, The Avenue, Castle Hill, Ealing, W.; John William Wilson Armstrong, Blacon, Stratford-on-Avon; William Beauchamp Aubrey, Springfield Villa, Chelmsford, Essex; Ronald Bartram, Fern Lea, Kelso-road, Highbury, N.; Frank Bate, 2, King Edward-road, South Hackney, N.E.; Harold Alfred Bettger, 21, Victoria-road, Kilburn, N.W.; William Raper Bingham, 53, Jerningham-road, Hatcham, S.E.; Arthur George Bradshaw, 7, Gage-street, Lancaster; Clement Joseph Bentley Bridgewater, 91, Portland-place, W.; Hugh Colley Brierley, Sledmere, York; Herbert Westwood Brindley, 85, Balsall Heath-road, Edgbaston, Birmingham; Sydney Lowther Broad, 3, Verulam-place, Yelverton-road, Bournemouth; Thomas Even Butcher, The Bank, Chesham, Bucks; Basil Charles Harman Cannell, Fernley, Newmarket-road, Norwich; Arthur Paul Chattell, Camden Rise, Chislehurst, Kent; Geoffrey Redmore Church, 2, Steele's-road, South Hampstead, N.W.; Nathaniel Clark, Junr., Beamish Park, Pitt-hill, R.S.O., Co. Durham; George Harry Cole, 30, Hadlow-road, Tonbridge, Kent; Frederick Noel Cooke, 24, Highfield-street, Leicester; Gerald Harwood Cope, Broxton, Chester; Charles Hubert Cramp-horn, 8, Cambridge-terrace, Chatham, Kent; George Herbert Croft, 10, Sussex-square, Brighton, Sussex; Edward Harold Crump, Denbeigh, Victoria-terrace, Cheltenham; Harold Wynne Curry, 55, Linden-gardens, W.; Henry Dann, jun., Highlands, Dartford, Kent; John William Satterley Humphreys Davies, 8, Laurence Pountney Hill, E.C.; Percy Frederic Dyer, Amatola, Wallands Park, Lewes, Sussex; Harold Edgar Edwards; 29, Blantyre-street, Chelsea, S.W.; Rupert Lumley Ellis, 41, George-lane, Lewisham, S.E.; Harold Evered, Oatlands, Horley, Surrey; John Leonard Harris Flew, 7, Cunliffe Villas, Manningham, Bradford; Alfred Cardain Frost, Sunnyside, Epsom-road, Morden, Surrey; Henry Arthur Armytage Gate, 20, Mecklenburgh-square, W.C.; Sydney Salter Gettings, The Mount, Chester-road, Erdington, near Birmingham; Harner Gould, 29, Woodvale, Forest Hill, S.E.; Gerald Francis Charles Hamilton, Hamwood, Dunboyne, Co. Meath; William Wyatt Ridgway Harlow, Northwood House, Hanley, Staffordshire; Harold Kenneth Harcourt Henderson, The Stalls, St. Johns, Worcester; Henry Augustus Stafford Noel Hoare, 7, St. Stephen's-crescent, Bayswater, W.; Alfred Egbert Hooper, Laura-place, Andover, Hants; William Charles Houghton, 41, Prospect-hill, Walthamstow, Essex; Charles Frederick Hutchinson, Oak Tree House, Preston, near Hull; Edward James Slark Jenner, Stanley Villa, Henley-on-Thames; Harold Driver Jonas, 4, Whitehall, S.W.; Arthur Vernon Kislisbury, Parkside, Hendon-lane, Finchley, N.; Walter Frederick Langridge, 8, Lansdowne-road, Tunbridge Wells; Lawrence Lanham, The Auction Mart, Basingstoke, Hants; Frank Arthur Lees, 2, St. Paul's-square, Bedford; Henry Lemmoine-Cannon, 216, Brixton-road, S.W.; John Lewis, Worley-road, St. Alban's, Herts; Frederick Robert Lunley, The College of Agriculture, Downton, Wilts; William Smith Mackintosh, Four Elms, Studley, Warwickshire; Sydney Mager, 28, Carleton-road, Tuftnell Park, N.; Frederick Rowland Mark, 32, Arbour-square, Stepney, E.; Cecil Valentine Watson Martin, 55, Westgate, Wakefield; Thomas James Meaby, Canford, Wimborne; Sydney George Meacher, Sunny Lodge, Malvern Link, Worcestershire; Henry Lingwood Michell, 8, Bessborough-gardens, South Belgravia, S.W.; Denzil Adair Morie, 102, Jermyn-street, S.W.; Samuel Henry Newsome, High House, Alvechurch, Worcestershire; Sidney Samuel Orchard, 2, Okehampton-terrace, Exeter; Algernon Berkeley Paget, 20, Letham-gardens, W.; Guy Kenyon Pierson, Woodlands-road, Altrincham, Cheshire; Gilbert Pinson, Lynton House, High-street, Solihull, Warwickshire; Frank Percy Pratt, Castle House, Ongar, Essex; Henry Robert Quarterly, 32, Victoria-street, Maidstone, Kent; Harry Symons Rendell, Forde View, Newton Abbot, Devon; Walter Francis Robbins, Crookshard, Wingham, Kent; Arthur Dennett Rutley, Birchwood, Caterham Valley, Surrey; Peter Schofield, 10, Dan Lane, Atherton, Lancashire; Edwin Sharpe, 21, Highfield-street, Leicester; George Stuart Simpson, 6, Laurel Bank, Lancaster; Edward John Stead, 82, Derby-street, Moss Side, near Manchester; Charles Frederick Stedman, Grantley Villa, Cranleigh, Surrey; Arthur Walter Alfred Claude Tanna-hill, Firsleigh, Alexandra-road, North Finchley, N.; Rudolph Tanner, 29, Pelham-place, South Kensington, S.W.; Walter William Tremlett, The College of Agriculture, Downton, Wilts; Vincent Turner, Borough Surveyor's Office, Town Hall, Wolverhampton; Thomas Blake Wacher, Ethebert-road, Canterbury, Kent; Peryn Watson, New Grove, Petworth, Sussex; Edward Merton Webb, School House, The Close, Norwich; Cyril Swaffer Weekes, 25, Mount Sion, Tunbridge Wells, Kent; Hugh Welsh, Dovenby, Cocker-mouth, Cumberland; Frank Cornelius Wheeler, The Tilt, Stoke D'Abernon-road, Cobham, Surrey; Cyprian Charles Oswald Whiteley, 44, Ellison-road, Streatham Common, S.W.; Charles Edwin Widdicombe, Brooklands Farm, The Avenue, Cambridge; Sidney Prudden Wigley, Wimslow, Bucks; Hanbury Williams, 43, Prince of Wales-road, Norwich; Joseph Winslip, Regent-street, Cambridge; John Giley Withycombe, Stanhope-road, St. Albans, Herts; Thomas Henry Wright, 96, Thrale-road, Streatham Park, S.E.

\* Passed at head of List.

#### CLAYS USED FOR MAKING BRICKS AND POTTERY.

**M**R. BENJAMIN HOLGATE, F.G.S., delivered a lecture on Monday evening to the members of the Yorkshire College Engineering Society at Leeds on the subject of "Clays used for Making Bricks and Pottery." The President of the society (Mr. Henry McLaren)



occupied the chair. The object of the lecture, as Mr. Holgate explained, was a very practical one. It would doubtless be that in time to come many of the students might find themselves following their profession in distant lands. He wished them, therefore, to be able to judge as to the suitability of any particular clay for the manufacture of bricks, and the criteria to be set before them would, he hoped, assist them to form an accurate conclusion. Mr. Holgate detailed the various kinds of clays which might be observed in the colour and nature of the class of buildings erected in different localities. For instance, commencing in Dorsetshire, and travelling thence through London to Yorkshire, they would note that the material used gradually changed. In Dorset all the buildings were of brick, and that was so through London and as far as Huntingdon. In East Yorkshire, as at Brough, they would find almost the same kind of cottage as in the Fen district—very old buildings, with very thick walls compounded of mud, lime, and gravel. In the great Vale of York, however, they would notice that all the villages were ruddy with their red-tiled roofs. In West Yorkshire, as they approached the hilly country, they would find, as in Leeds, many of the houses were built of bricks well blackened over; but before that they often saw the bricks "sweating," and showing a deposit of white salt. Further west, where the rocks were near the surface, the houses were built of freestone, and up to recently were also covered with thin flagstones of the same material. In Oxford and Cambridge the buildings were of oolitic limestone, which soon decayed, and had a venerable appearance. In the slate country, houses were naturally built of slate. At the present time, the great majority of buildings were built of bricks moulded either standard size or in any form that might be desired. Mr. Holgate dealt also with china, tertiary, Gault, drift, carboniferous, and ganister clays, and the treatment of carboniferous, also touching on fire and ordinary bricks. He gave a scientific definition of the substance of clay, and a practical commentary thereon. He mentioned that at Poole, in Dorsetshire, there was a bed of 500 different kinds of clay, and remarked that it was from that place that the makers of clay smoking-pipes in Leeds obtained their material. The brick-making value of clay depended on its fluxing qualities. In conclusion, Mr. Holgate said he hoped that, by carefully studying the subject from the points he had given them, any of the students present, when they came across a suitable clay, even in a country they had not seen before, might be able to say, "Here is a clay from which bricks can be made."

#### NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

**T**he National Association of Master Builders of Great Britain held its thirty-eighth yearly meeting at the Old Bull Hotel, Blackburn, on Tuesday, the 26th ult., when representatives were present from London, Liverpool, Birmingham, Bristol, Manchester, Hull, Blackburn, Bolton, Bradford, Huddersfield, Wolverhampton, Plymouth, Southport, Scarborough, Leicester, Burslem, Wigan, &c. Mr. Thos. F. Rider, London, the president, occupied the chair. The report for the past half-year was approved and adopted. Mr. C. W. Green, of Liverpool, the hon. treasurer, submitted his audited accounts for the half-year, showing the financial position of the association to be most satisfactory. The president, in his opening speech, said that though the state of trade generally was good, they had to deplore the ruinous competition which seemed to prevail in all trades throughout the country. Competition up to a point was a very valuable thing, but he objected to "cutting each other's throats." This competition seemed to increase as years went on. He supposed it was one of those matters which would go on; but it was rather a pity that men should follow out a practice which was inimical to them in so many ways. Another thing that they had to consider was the old complaint of the "British Workman," whose desire seemed to be to give the smallest possible amount of work for the largest amount of wage. The only remedy seemed to be a revival of the old system of payment for piece-work. As regarded the question of the Employers' Liability Bill, no doubt this would be of a considerably more stringent character than ever. In seemed probable they would be held liable for accidents of every description, whether caused by negli-

gence or otherwise, and he thought that this liability might be met by joint insurance. If some means could be devised to make a fund to be subscribed to by master and workman, it might solve the problem of Employers' Liability. No further steps had been taken respecting the Plumbers' Registration Bill. The question of arbitration had taken up a great deal of time with many of the Associations. In London they had a clause that in the event of any man being obnoxious, and the employer refusing to discharge him at the wish of the workmen, the matter should be referred to arbitration, and if the masters and workmen could not agree in the choice of an arbitrator, the Board of Trade should appoint one. If this rule became universal there was no doubt that it would lead to a much more happy state of things, as there must necessarily be more satisfaction in arbitration than in fighting a matter out. The president then spoke at length as to the best form of contract, and stated that the old form agreed upon more than 25 years ago still continued in use in face of a new and more elaborate one prepared by the architects, and this principally because of the unfairness of the arbitration clause, which was the most important part of a contract. Finally, he wished to increase the scope of the National Association of Master Builders, and make it in every sense a "National" Association. Mr. Bowden, of Burslem, and several other members supported the president's remarks with regard to increasing the scope of the Association. The question of the form of apprenticeship indentures was discussed, and it was decided to leave the matter over until the next meeting, so that members should have an opportunity of further considering the proposed form. The secretary read a resolution of the London Central Association as to the scarcity of plasterers. The President said they had had considerable trouble in London, and one thing had been proved to them—viz., that the supply of plasterers was insufficient. Various ways had been suggested of increasing their numbers; among them were (1) to increase the number of apprentices, (2) to find a substitute for plastering, and (3) to maintain schools of plastering. It was decided to refer the matter to the council.

Mr. T. F. Rider, of London, Mr. J. Stevenson Jones, of Liverpool, and Mr. Ald. W. Holdsworth, of Bradford, were re-elected to the positions of president, senior vice, and junior vice-president respectively for the ensuing year. Mr. A. Krauss, of Bristol, was elected hon. auditor for the ensuing year. Mr. G. Hardington, of Leicester, and Mr. R. G. Jenkin, of Plymouth, were elected as members of the council for their respective towns. Mr. C. A. Hayes, of Bristol, invited the members of the association to hold their next half-yearly meeting in his city, which it was unanimously resolved upon to do.

#### CHIPS.

At a meeting held at Colwyn Bay on Monday it was decided to erect a new church in that watering-place in commemoration of the Diamond Jubilee. Promises of over £900 were made in the room.

Replying to a question in the House of Commons on Friday night, Mr. Hanbury, Secretary to the Treasury, stated that Parliament would be asked during the next two years to grant funds for glazing the paintings at the National Portrait Gallery which are immediately within reach of the public, so as to protect those works of art from the risk of damage.

A bust of the late Miss Buss is to be placed in the Camden School for Girls in the Prince of Wales-road. The commission has been given to Mr. Roscoe Mullins, who has recently been appointed to the Mastership in Modelling and Sculpture at the London County Council School of Arts and Crafts.

A Parliamentary estimate has been deposited by the engineers to the Great Western Railway Company of the capital expenditure which will be incurred in the event of the passing of the Bill to enable that company to construct a direct line from Truro to Newquay. The length of the proposed railway will be 12 miles 1 furlong, and the total cost of construction is set down at £112,218, of which £8,100 will be expended upon station accommodation. The railway will be constructed as a single line throughout its whole length.

Peterhead harbour is to cost much more than was estimated. The original estimate was £737,520. This has now been increased by the substantial sum of £160,000, making a revised estimate of £897,520. The increase appears for the first time in the New Year's estimates, and is explained to be due to the available convict labour being less than originally contemplated.

#### OBITUARY.

Mr. P. J. TUOHY, Secretary to the Irish Board of Works, dropped dead on Friday at Dalkey, near Dublin. Mr. Tuohy, who was a native of Cork, had suffered for some time from heart disease. Mr. Tuohy entered the Civil Service many years since, and from a comparatively humble post, by dint of industry and ability, worked himself up, step by step, until on the retirement of General Sankey, a few years ago, he was appointed secretary to the Irish Board of Works, which is one of the most coveted offices in Ireland. When the retirement of General Sankey was first announced, it was stated in many quarters that his successor would be a relative of a politician who had filled the position of Chief Secretary for Ireland. The office was, however, conferred upon Mr. Tuohy, who was already in the Department of the Board of Works, and who had on many previous occasions given proof of his superior abilities. It says much for the urbanity with which Mr. Tuohy discharged his duties, and for his tact and courtesy, that during the whole of his administration in an office he was never once mentioned by name in any of the Parliamentary discussions except in terms of praise. Some years ago Mr. Tuohy was called to the Irish Bar.

MR. THOMAS BLASHILL, F.R.I.B.A., writes in the current issue of the Architectural Association Notes:—"Old members of the Association will regret to hear of the death of a former secretary, ARTHUR SMITH, who held office from 1860 to 1862, at the beginning of the more modern period of the Association. It was then that, on the suggestion of the seniors, a committee of younger men was elected, with T. Roger Smith as president and A. W. Blomfield as vice-president; and about that time we ventured to migrate from Lyon's Inn Hall to more expensive quarters at Conduit-street, with the results which we know. Arthur Smith was a pupil of Messrs. Finch, Hill, and Paire, and was at Professor Donaldson's classes. His bright and genial manners helped us through the difficulties of the Association's earlier days at Conduit-street. Soon after holding office, he settled at Bognor in Sussex, where he died very suddenly of paralysis on January 4, aged 57. A wreath, inscribed 'From friends in the Architectural Association of London,' was sent for the funeral."

MR. STEPHEN DECATUR BUTTON, architect, of Philadelphia, died at his residence in Camden, New Jersey, on Jan. 17, in his 84th year. From a stroke of paralysis in October last he scarcely recovered consciousness, except at brief intervals, though previous to this attack his physical and mental faculties were well preserved. Mr. Button, says a correspondent, "H. B. B.," was an enthusiastic student of Classic architecture and though many Gothic churches were reared from his designs, he always felt more familiar with the Italian Renaissance, and in this style some of the more important buildings erected during the middle half of this century in Philadelphia and other cities and towns of the Eastern and Southern States can be ascribed to his pencil. For over fifty years his very considerable practice made him one of the most prominent architects in the States. During his youthful training he had the advantage of serving an apprenticeship to the carpentry trade, and from that went, at twenty-one, as assistant to George Purvis, an architect who had gone from Edinburgh to settle in New York, at a time when perhaps not more than five qualified architects could be found in the whole country. Mr. Button's very practical knowledge qualified him for designing and also erecting his buildings by contract—a not unusual combination of business in those early days, and he was occupied for fully ten years in this way. About the age of 31 he was engaged to design and erect the State House of Alabama, a commission he won in competition against the leading practitioners of the time; after two years spent in the superintendence of this work he returned north, and finally settled in Philadelphia, where for nearly fifty years designs for almost every variety of public and private buildings emanated from his office to adorn this and outlying cities and towns and country estates. His wide practical experience, unswerving integrity, and generous, helpful disposition won him honour and respect on all sides. Mr. Button had not wholly retired from professional work on attaining his 80th year, and received on that occasion, from his brother architects and old-time pupils in widely-dispersed cities



of the Union, warmest congratulations and expressions of esteem in the form of an elegantly engrossed and illuminated address. Mr. Burton was an advanced student of geology, and possessed a collection of fine architectural books, which he has presented to the Philadelphia Chapter of Architects, of which society he was one of the earliest members.

Mr. W. MITCHELL, J.P., senior member of the firm of Mitchell and Arnott, paper stainers, of Golborne, succumbed to an attack of paralysis on Sunday. Mr. Mitchell, who was 74 years old, commenced business in Manchester, but removed to Golborne 35 years ago, and was, at the time of his death, the head of Mitchell, Arnott, and Co., paper stainers, of Golborne, Dublin, and Belfast. He was a magistrate for Lancashire. In politics he was a Liberal, and he was an ardent Congregationalist. For a great number of years he was active in local government work, and only a few weeks ago was present at a meeting of the Urban District Council, when his portrait was presented to the township.

#### CHIPS.

The museums and galleries committee of Glasgow Corporation have purchased from Messrs. Morison Brothers, Glasgow, the collection of original water-colour and monochrome drawings by Mr. David Small, illustrating the volume recently published by them on "Bygone Glasgow." The collection consists of forty drawings.

The Primitive Methodist Chapel at Boston, Lincolnshire, was almost destroyed on Friday by fire, despite the efforts of the two local fire brigades. The chapel was built in 1866, and accommodated 720 worshippers. The fire is supposed to have originated with the heating apparatus.

Among the "lots" offered for sale at Tokenhouse Yard, London, was the Esplanade Pier at Shanklin, which was offered by order of the directors and with the concurrence of the mortgagee. The pier is 1,100ft. long and 30ft. wide, and is constructed of wood and iron. The amount expended on its erection is said to have been £18,000. Biddings ranged from £5,000 to £6,950, after which the property was bought in at £7,500.

A new pulpit, erected in Barnet Church, was dedicated by the Bishop of St. Albans on Sunday. It is from the studio of Messrs. Harry Hems and Sons, Exeter, is made of oak, and was designed by Mr. J. C. Traylen, architect, of Stamford. Late Perpendicular in style, it consists of an extended octagonal-shaped body, and is approached by stone steps. Above the pulpit is a carved canopy, with fan tracery work, and having emblems of the Agnus Dei and Holy Dove. The canopy is supported by buttressed uprights, with the intervening spaces filled with tracery work. There are six niches in the body of the pulpit, filled with statues of prominent preachers in different periods of English Church history.

In accordance with the provisions of the Charter, a general assembly of the Royal Scottish Academy has been summoned for Wednesday next, the 10th inst., for the purpose of electing a new Academician. The three Associates whose names are being mentioned in connection with the vacancy are Mr. G. Ogilvy Reid, Mr. A. Roche, and Mr. P. W. Adam. Sir George Reid, the President, has given notice that on the same occasion he will move that Sir E. J. Poynter, the new President of the Royal Academy, and R. Rowand Anderson, LL.D., architect, Edinburgh, be elected honorary members of the Academy.

The Water Committee of the Sheffield Corporation have brought forward a scheme in connection with the engineering work for the Little Don Valley Waterworks, which stipulates for the appointment of an experienced civil engineer to reside in the district. He is to devote the whole of his time to the work, and to be responsible for the designing and construction of the Langsett Reservoir, at a salary of from £1,200 to £1,500 per annum. Mr. E. M. Eaton is to be the consulting engineer at £500 per annum, with an additional £250 as consulting engineer for the existing works and for distribution. The numerous applications for the first-named post have been reduced to six at a recent meeting of the water committee.

After a long negotiation with a large number of small freeholders between Maentwrog and Trawsfynydd, it is now announced that Mr. Thomas Jones, C.E. (Messrs. Tapp and Jones, London), has secured all the options to construct a large lake, measuring about two miles long by a mile in width, to provide motive power to work an electric manufactory stationed at Maentwrog, close to the famous waterfall, Rhaiadr Du, in connection with which works are proposed to be erected at Penrhyneddraeth for the manufacture of acetylene gas.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—A meeting of the above Association was held on Tuesday evening at the Grosvenor Hotel, Dublin, Mr. R. Caulfield Orpen, president, in the chair, and among those present were Mr. T. Drew, Mr. W. G. Doolin, and about 40 members, and a very interesting lecture was given by Mr. W. J. Fennell, of Belfast, on "Some Old Buildings in Antrim and Down," which was illustrated by lantern. The lecturer gave some interesting accounts of the ruins at Holywood, Co. Down, the old churches at Newtownards and Movilla, and the very interesting ruins of the old Cistercian abbey known as Grey Abbey, the Castle at Drumdrum, the Cistercian abbey known as Inch Abbey, and thence on to the historic tower of Carrickfergus, with its fine old church of St. Nicholas; Antrim, with one of the best-preserved round towers in Ireland, 92ft. high and 50ft. circumference at base; Ballycastle, with its old abbey and gate-house, and the extremely interesting stronghold of the McDonnell's, Dunluce Castle. Mr. T. Drew having proposed, and Mr. McGloughlin seconded, the vote of thanks, the chairman announced the next meeting for the 16th inst., when Mr. F. Batchelor will lecture on "Hospitals and Hospital Construction." The drawing done by members of the advanced class of design (the subject being a "Village Public-House") were hung in the room, and attracted much attention.

BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this society was held on Friday night at the Great Northern Victoria Hotel, Bradford, the members present being Mr. James Ledingham, president; Mr. B. D. Fairbank, secretary and treasurer, and Messrs. Charles Gott, John Hindle, T. H. Healey, Charles France, Samuel Jackson, W. B. Woodhead, Wheeler Smith, C. H. Hargreaves, T. C. Hope, Richard Horsfall, R. Arnistead, Rhodes Calvert, Brian Cowgill, James Young, W. H. H. Marten, Samuel Robinson, John Flew, Thomas Barker, C. E. Milnes, C. H. Gott, A. G. Adkin, John Drake, T. T. Empsall, J. H. Woodhead, Walter Jackson, Alfred Walker, Charles D. Colinson, and H. A. Johnson. Mr. W. B. Woodhead was elected president for the year, and Mr. Fairbank was re-elected secretary and treasurer. After the election of the council the annual dinner was held, the company including the following guests:—Mr. George McGuire (town clerk), Mr. W. B. Gordon (vice-president of the Bradford Incorporated Law Society), Mr. C. H. Milthorpe (chairman of the Bradford School Board), Mr. John Maddocks, and Mr. W. M. Gray. The usual loyal toast was proposed by the President. Mr. Gordon proposed "Prosperity to the Bradford Society of Architects and Surveyors," and Mr. Charles Gott responded. Six new members have been elected this year, and the health of these was proposed by Mr. France. "The Town and Trade of Bradford" was given by Mr. Hope, and Mr. John Maddocks responded. "Our Visitors" was proposed by the President, and "Our Municipal Authorities" by Mr. Hargreaves. Both these toasts were acknowledged by the Town Clerk. The other toasts were "The President-Elect," submitted by Mr. Jackson; "The Retiring President," by Mr. Healey; and "The Secretary," by Mr. Wheeler Smith.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual meeting of this association was held on Friday evening at the Guildhall, Small-street, Bristol, under the presidency of Mr. C. A. Hayes. The secretary (Mr. Henry J. Spear) presented the annual report, which stated that during the past year business had been active in most of the branches of the building trade. The question of apprentices' indentures had received careful consideration. Several local forms used by employers of labour in the city were discussed, and eventually it was resolved to submit to the National Association the form recently issued by Messrs. Thos. Pole and Son, of Bristol. The half-yearly summer meeting of the National Association was held in Edinburgh, which was also attended by members of this body, and at that gathering an invitation was given to the association to hold its summer meeting of 1897 in Bristol; the invitation was accepted. It is now twelve years since this association visited Bristol. A committee will be formed immediately after the annual meeting for the purpose of arranging a detailed programme. A letter has been addressed to the Town Clerk of the city to the effect that it had

been unanimously resolved by the association to enter a protest against the adoption of the eight hours per day movement for operatives engaged by the Corporation of Bristol, as the members consider that the present arrangements of 54 hours in summer and 48 in winter per week was satisfactory and quite short enough, and further that any alteration would be detrimental to the building trade of this city. Discussions had taken place during the year with reference to priced bills of quantities, and the following resolution was adopted by a large majority:—"That, in the opinion of the members of this association, the practice of depositing priced bills of quantities with architects at the delivery of the tender is both unfair and inconvenient to the contractor, and should be discontinued by the members from the 5th November last." Mr. O. A. Hayes moved, and Mr. A. Krauss seconded, the adoption of the report, which was carried *nem. con.* The Treasurer (Mr. George Humphreys) presented the audited accounts, which showed a credit balance of over £50. The President moved, Mr. George Humphreys seconded, and it was resolved by acclamation, that Mr. August Krauss be elected president of the association for the current year. Upon the motion of Mr. E. Walters, seconded by Mr. George Wilkins, it was resolved unanimously that Mr. William Church be elected vice-president for the ensuing twelve months. The re-election of Mr. George Humphreys as treasurer to the association was unanimously adopted upon the motion of Mr. Frank Cowlin, seconded by Mr. A. S. Scull. A vote of thanks was accorded to the retiring president (Mr. C. A. Hayes) for his valuable services during the past year.

DUBLIN MASTER BUILDERS' ASSOCIATION.—The annual meeting of the Master Builders' Association was held on Thursday in last week at the Grosvenor Hotel, Westland-row, when there was a large attendance of members. The chair was occupied by the President, Alderman the Right Hon. Joseph M. Meade, J.P., P.C., LL.D. The report for the past year was read and adopted. The treasurer's report was also read and adopted. The election of officers and committee for the ensuing year then took place, with the following result:—President, Alderman the Right Hon. Joseph M. Meade, re-elected; hon. secretary, John Good, re-elected; hon. treasurer, James Kiernan, re-elected; committee, James Beckett, Samuel H. Bolton, J.P., James Connolly, James Martin, Thomas Mackey, John Pemberton, Henry Sharpe, J.P., Alderman R. Toole. A vote of thanks to the President (Alderman Meade) was proposed by Mr. James Beckett, seconded by Mr. R. D. Bolton, and passed unanimously.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the association was held on Thursday night in last week, Mr. G. S. Aitken in the chair, when Mr. Alexander Drew, C.E., delivered the first of a series of lectures on "The Practical Designing of Iron and Steel Roofing." At the outset the lecturer pointed out the difference in treatment which was necessary in substituting iron or steel for timber in roof framework, and noted generally the lines on which this treatment should proceed. The necessity of considerable practical training and experience was emphasised, and it was claimed that only those possessing such special training were competent to design thoroughly practical and economical structures. It was admitted, however, that in the case of the smaller and more ordinary types of framework frequently met with in everyday practice, sufficient knowledge might be acquired by study to prevent the architect from falling into serious error, and insure the result being at least practical and safe, if not the best and most economical. A vote of thanks was accorded the lecturer, on the motion of Mr. D. Hunter Crawford.

NORTH STAFFORDSHIRE BUILDERS' ASSOCIATION.—The annual dinner of the Potteries, Newcastle, and Leek branch of the Builders' Association of Great Britain was held at the Saracen's Head Hotel, Hanley, on Wednesday night. The chair was taken by the President, Mr. J. Gallimore, J.P., Newcastle; the vice-chairs by Messrs. W. Grant, Burslem, and L. Price, Stoke; and over fifty were present. Mr. H. Cartledge gave "Success to the Building Trades and the Builders' Association." Four years ago it would have been very pleasing to propose such a toast, but from the outlook at present success seemed a long way off. The builders were being hampered in many ways at the present time. Notice had just been given that men were going about from



place to place scrutinising on behalf of the men their position. With regard to apprentices, he thought that builders ought to have control of their own affairs, and not to be told how many apprentices they should have. Mr. Bowden (secretary), in responding, said he hoped all demands made by workmen would be considered in a fair and reasonable manner. This could only be done when they were completely joined as to the issue. As showing the advance that trade unions, in connection with their trade, had made from 1887 to 1895, Mr. Bowden said the joiners had increased from 25,000 to 44,000, the bricklayers from 6,000 to 24,000, and the masons from 10,000 to 16,000. Financially, the unions had increased from £67,000 in 1885 to £119,000 in 1895. At the present time builders were having a struggle for existence. He calculated that they did not make 5 per cent. profit on their year's turnover—a profit which, taking into consideration the energy, intelligence, and capital required, was not sufficient. The chairman, on behalf of the association, presented Mr. G. Ellis, sen., with a handsome address on vellum, bound in Russian leather, together with a purse of money, as a recognition of his seven years' service as the hon. secretary of the association. Mr. Ellis suitably acknowledged the presents. In responding to the toast of "The President and Officers," proposed by Mr. Bagnall, the chairman gave some useful hints to young builders and contractors, advising them never to undertake a contract they could not carry out with profit to themselves, and to keep to the association. Mr. L. Price also responded.

**SCOTTISH LAND VALUATION ASSESSORS.**—The annual meeting of the Association of Lands Valuation Assessors for Scotland was held in the Lands Valuation Office, City Chambers, Glasgow, on Friday, when the retiring president, Mr. James Smith, Glasgow, presided over a large attendance of members. Papers by Mr. B. Corke, Aberdeen, and Mr. John Allan, Edinburgh, on recent valuation and registration decisions, and by Mr. Alexander M'Dougall, Greenock, on the Sea Fisheries (Scotland) Act, 1895, so far as it relates to assessors, were read and discussed. Various other questions were discussed, including the valuation of telephone and telegraph wires, introduced by Mr. Henry, Glasgow. The office-bearers for the ensuing year were elected as follows:—President, Mr. John Brown, Hamilton; vice-president, Mr. P. Musgrove, Dundee; secretary, Mr. Robert Hamilton, Greenock; treasurer, Mr. James Smart, Portobello. Committee: Messrs. Alexander Bain, Edinburgh; H. Eldrid, Glasgow; R. D. Tannahill, Kilmarnock; A. J. Lothian, Galashiels; James Reith, Paisley; and Alexander Scott, Hawick. The members afterwards dined together at St. Enoch Station Hotel.

Mr. J. Galloway Weir, M.P., has received an intimation from the First Commissioner of Works that arrangements have been made for the immediate repair of the ancient tapestries at Holyrood Palace.

In our report of the case "T. Drew-Bear and others v. St. Pancras Guardians and A. and C. Harston," in issue of the 22nd ult., p. 150, 3rd column, the name of one of the witnesses called by the plaintiffs, the manager to Messrs. Kirk and Randall, was, by a printer's error, given as W. J. "Bradshaw" instead of Renshaw.

At Colebrooke, Devon, the font-cover in the parish church has just been restored by Messrs. Harry Hems and Sons, of Exeter, who have also done much other work at the church from time to time. During the seven years of the Rev. B. Jones's incumbency the edifice, practically on his arrival a ruin, has been carefully renovated, from the designs of Messrs. Tait and Harvey, architects, of Exeter, and although more necessary work remains to be done, the edifice is now in a fairly presentable condition.

The plans for a new cycle factory at Coventry, for Messrs. Hotchkiss, Mayo, and Meek, are completed. The situation of the factory will be in a new street off the Foleshill-road, between the Hop Pole and Harnall-lane. The works will have an imposing frontage of 174ft., and will comprise the usual departments, with a suite of offices, two stories high. Mr. T. F. Tickner is the architect.

The College of Civil Engineering of Cornell University is about to build a new hydraulic laboratory of immense size, having a rock-cut canal 500ft. long, 20ft. wide, and 10ft. deep, and a steel standpipe—in which the force exerted by great masses of water is to be studied—which is 6ft. in diameter and 70ft. high. No other hydraulic laboratory of half the magnitude of this one has ever been constructed.

## COMPETITIONS.

**GUERNSEY.**—The States of Guernsey invite competitive plans and designs for a new States assembly hall and adjuncts proposed to be erected adjoining the Royal Court House, at a cost not to exceed £15,000. They offer premiums of £100 and £50 for the two plans which may, in their order of merit, be judged by the States most suitable for the purpose, the successful plans and designs to become the absolute property of the States to adopt in whole or in part as they may deem necessary or desirable without further payment to the successful competitors. A copy of the instructions, with a lithograph plan of the site, with levels and photographs of the surroundings, will be forwarded to intending competitors on application to Mr. N. Domaille, States Offices, Guernsey, on receipt of a fee of 5s., which will not be returned. Sealed plans and designs, distinguished by a motto or device (which must also be inclosed in a sealed envelope, together with the name and address of the competitor, in order that he may be identified after the award), must be addressed to the Supervisor of the Harbour and Treasurer of the States, and delivered so as to reach his office, Fountain-street, Guernsey, by April 17. The committee will be advised by a professional assessor in their selection of the designs to be submitted to the States for acceptance.

**LISKEARD.**—The committee who are arranging for the rebuilding of the tower of Liskeard Church have received two reports from Mr. Edmund Sedding, of Plymouth, who was appointed to consider the different designs for the execution of the work. Mr. Sedding selected the plans of Mr. Sansom, sent in under the motto "Moorstone" (in a shield), and numbered 20. He awarded the second premium to "Trecarrel," No. 19, by Mr. H. P. Burke Downing, of Great College-street, Westminster. In his report on the several designs, Mr. Sedding said: "I recommend the adoption of a compromise between 'Moorstone's' main design and his alternative scheme; that the height should not exceed 80ft.; that all the old features of the present tower be reused—of course, including the old tower arch. In short, that a scheme of rebuilding be aimed at, rather than the demolition of the existing structure. There are many parts of the old fabric that might well be utilised for the new building that it would be unwise to discard, if only for the archaeological interest that they afford, for it would be a lasting discredit to the town were they suffered to be destroyed. I refer to much of the old stonework that might be utilised for outside facing, with some weatherings and other moulded work, placing all the old at the lower part of the tower. This will help you in the cost, and materially add to the interest of the new structure. The successful competitor should be restricted to these conditions, or an interesting old landmark will entirely vanish." The committee have adopted Mr. Sedding's report, and have since received and approved a supplementary report, in which he said: "Since the writing of my former report, I have carefully examined the existing structure. The gaping cracks, through which a hand may be thrust, although so apparent on the inside, are far less discernible on the outside, owing, no doubt, to their having been externally repaired in past times. The tower is rent in various directions by these cracks, apparently in consequence of defective foundations. The fabric dates from the 12th century, but has been altered from time to time. The tower arch is, in my opinion, of two dates, the responds being the original Norman, their leaning lines being a corroboration of my opinion, whereas the arch is depressed and pointed, and this I attribute to some half-century later. Probably this arch was rebuilt; it may be owing to the same mischief as that with which you now have to deal. You should, however, notice that the later workmen reintroduced the same old material, redressed, of course, to suit the altered shape of the arch. The 12th-century windows are now in danger of having their outer facing completely detached from the inner, there being apparently no bond to keep the two facings together. The 17th-century mask of granite with the west door extends to about one-third of the height, and only half-way, more or less, along the sides of the tower. The battlements are of this date. The height of the tower is 60ft. There can be no doubt whatever that the present structure is in a precarious condition, and should be promptly prevented from further dislocation, which would

cause the fabric to collapse. It is, I understand, the desire of the committee to heighten the tower some 20ft., as suggested by the successful competitor. This cannot be done with safety without strengthening the substructure, which is now unable to support itself. Any method short of rebuilding would be but temporary, for the tower foundation needs underpinning. Under the circumstances I should not recommend it, for it would be attended with considerable danger. The only alternative, and in the end the most conservative method, would be to rebuild, carefully preserving and marking the old materials, so that the present tower may be re-erected as far as it can be done, any new walling stone being in harmony with the old. The 17th century granite facing to be used in the lowest part with the old plinths. I am quite sure you could have no better man than your chosen architect to carry out this most important work, which, if carried out on these lines, will be one of the most interesting pieces of conservative craftsmanship executed in this country."

**NUNEATON.**—The urban district council have finally adopted the competitive plans for a free public library submitted by Messrs. Wood and Kendrick, of West Bromwich. The estimated outlay is £1,200.

**SOUTHERN LONDON CONVALESCENT HOSPITAL.**—The Metropolitan Asylums Board decided on Saturday to invite a selected number of architects to send in designs for the Southern Convalescent Hospital. Instead of paying a commission, the board will give a fee of £5,000 to the successful competitor.

**SUNDERLAND.**—Forty-three sets of designs for the new technical schools at Sunderland were received, and Mr. J. M. Brydon has been appointed as professional referee.

**WALSALL.**—Messrs. Hickton and Farmer, architects, Walsall, have been successful in the competition for the new Primitive Methodist Chapel which is about to be erected in Moor-street, Dudley. The building will seat 400, and cost £1,200.

## CHIPS.

Good progress has been made with the new town-hall buildings at Weston-super-Mare. The south wing, comprising clerks' and surveyor's departments, is approaching completion, and the council chamber improvement will shortly be taken in hand. The work is expected to be completed by the end of July.

A Local Government Board inquiry has been held at Hartlepool with reference to the proposed extension of the borough. It was stated that the present population is 24,600, and the ratable value £65,866. The proposal is to include within the borough 215 acres of the Thurston rural district, and 431 acres of the parish of Hart.

Two lectures on "Why Buildings are Interesting," will be delivered by Mr. F. Herbert Mansford to the South Place Ethical Society on Monday next and the following Monday, the 8th and 15th prox. The chair will be occupied by Mr. Alfred Preston, past-master of the Carpenters' Company.

The Bridgeton and Carmyle section of the Glasgow central line of the Caledonian Railway Company was opened on Monday. The branch has four stations:—Bridgeton Cross, Parkhead, Toll-cross and Carmyle, where the line joins the Rutherglen and Coatbridge branch. The extension of the new line to Newton near Glasgow was opened for goods and mineral traffic on Saturday.

The Egyptian Government has granted a concession to the Cairo Tramways Company to make a line to the Pyramids, and also to fill up the Khalig Canal, running through Cairo, and construct a line over it. The latter scheme will be a great sanitary improvement, as it will remove one of the causes of malarial fevers.

The East London Waterworks Company estimate the cost of the reservoirs, for the construction of which Parliamentary powers are to be sought this session, at £342,000. The site of the intended new reservoir covers 32 acres on Chingford-marsh, Wild-marsh, and Mitchey-marsh.

Windsor Castle is to have a museum for the reception of some of its historical relics which, owing to the want of a suitable place for their exhibition, have hitherto been inaccessible to visitors. The place selected for their arrangement is the spacious vestibule between the grand staircase and the Master of the Household's office. Here the walls are being fitted, under the supervision of Mr. Leonard Collman, the Queen's Inspector of the Palace, with handsome oak and plate-glass cabinets, and in these the numerous curios will be displayed when the cases are completed.



## Building Intelligence.

**BRISTOL.**—A group of insurance offices is now being erected by Mr. A. J. Beavan, contractor, of that city, from the designs of Mr. Edward Gabriel, architect, of London and Bristol, on a prominent site in Baldwin-street, at the corner of Marsh-street. The style of the building is Renaissance, and it consists of four stories and basement. Externally the ground floor is of blue Pennant and Hamhill stone, the upper floors being executed in Bath stone and bright red Cattybrook bricks. Internally the ground floor is being designed to accommodate two insurance companies, with separate entrances, whilst the remaining floors are devoted to suites of offices. An oak staircase with glazed brick wall dado leads directly from the entrance to the various floors. All the floors are of fireproof construction, and will have wood block flooring. There are strong rooms and lavatories on each floor, and other conveniences. The construction of the building is so arranged that the floor space can be subdivided into large or small offices to suit the requirements of tenants. The joinery and flooring on the ground floor will be of oak or teak. The building will be ready for occupation by 29th September next. The estimated cost of the work, including cost of site, is £13,000.

**BURY, LANCs.**—A new chapel and Sunday-school are about to be built for the Baptist congregation who have for many years worshipped in Knowsley-street, Bury. The architect for the building is Mr. Thomas Nuttall, of 20, Market-street, Bury, and the contract for the building has been let to Mr. C. Brierley, of Fishpool. The chapel and school will be situated on a corner site in Manchester-road and Knowsley-street. The buildings will be Gothic in style, and constructed of bricks, with red pressed brick facings and dressings of Greetland stone. The flooring will be of pitchpine wood block, laid to pattern; and the bench-end seats, rostrum, and the roofs will be of the same wood. The interior will be plastered. Accommodation will be provided for 372 persons. In the school and class-rooms the accommodation will suffice for 300 children, and in addition there will be a room to accommodate 50 infants. The school and class-rooms will be lined with facing bricks. Four of the class-rooms will be divided from the main body of the schoolroom by patent glazed screens, and the smaller rooms can at any moment be thrown open to the schoolroom, so as to form one large room. The heating will be so arranged that the school and chapel can be warmed either together or separately. The estimated cost will be £4,000.

**CROWBOROUGH.**—The foundation-stones of a new Wesleyan chapel were laid near Crowborough Beacon, Sussex, last week. The building will accommodate, ultimately, 310 persons, although for the present only 210 sittings will be provided, part of the church being divided off by a removable screen, to make provision for a Sunday-school. The size of the complete building is 56ft. 6in. by 34ft. 4in., measured inside. The schoolroom provides for 100 children, and can form part of the chapel by opening four sets of shutters. At the rear of the schoolroom is a vestry, 12ft. 6in. by 12ft. 6in., and a kitchen with fittings, while outside are the usual offices. There is a rostrum and Communion inclosure at one end, and a lobby at the entrance. The building is in the Early Decorated style, and is faced externally with local stone, Bath stone being used for the chief features. The windows will be glazed with leaded cathedral glass to design, while ventilation is provided for by inlets, and an Archimedean exhaust. Space has been reserved for the erection of a minister's residence. The architect is Mr. F. Boreham, of London, and the builder Mr. G. Beard, of Crowborough. The scheme involves an expenditure of £1,450.

**GATESHEAD.**—The Mayor opened on Saturday a branch establishment that has been erected for the Newcastle Savings Bank at the corner of West-street and Bensham-road, Gateshead. The style adopted is English Renaissance. The building has a Peterhead granite plinth and doorway; above the plinth and up to the first-floor level the facing is of Kenton stone, varied with red stone from Dumfries; above the first-floor level the facing is of Normanby red brick, relieved with stone bands and dressings. The roof is covered with green slates, and the dome at the angle is of copper. The banking-room, lighted on three sides, measures 37ft. 6in. by 26ft. 6in.,

and is entered at the angle through an inner porch of oak, with lead glazing introduced. Messrs. Haswell and Waugh, of Gateshead, were the contractors, and Mr. G. B. Burnett has acted as clerk of works. The contract for the whole of the work was £3,615, and it has been carried out under the supervision of the architect, Mr. Stephen Piper, M.S.A., County Chambers, Newcastle.

**IMPROVEMENTS AT THE HOUSES OF PARLIAMENT.**—Provision is made in the 1897-98 Estimates for completing the scheme of mosaic decoration in the Central Hall at Westminster in harmony with Sir Edward Poynter's "St. George" over the entrance to the Lords' corridor. Drawings of St. Andrew, St. Patrick, and St. David have been in existence for some time; but, in the absence of the necessary funds, nothing has been done towards filling the vacant panels for which they were prepared. The work is estimated to cost £750. The House will also be asked to sanction items of £800 for the construction of a glass awning over the entrance to the Speaker's house—a much-needed improvement—£150 for the formation of a new doorway to the terrace, £150 for extending to the dining-room and library the scheme of telegraphic communication which has worked so well in the smoking-room, and £1,000 for a further extension of the electric lighting of both Houses.

**MERTHYR TYDFIL.**—The largest, and probably the most important, of all the schools or colleges to be erected under the Welsh Intermediate School Building Act was publicly opened on the 13th ult. at Merthyr Tydfil. The total cost was £6,918, and that of the buildings portion £4,493, which, for 200 scholars, gives less by £257 than the £25 per head limit allowed. The walls generally are of local hammer-dressed stone, relieved with freestone dressings, the roofs being slated. The contractors were Messrs. Thomas Watkins and Co., of Swansea, and the architect was Mr. E. H. Lingen Barker, of London, Hereford, and Cardiff.

## CHIPS.

The artisans' dwellings in course of erection upon land near the river Sherbourn, off Cox-street, Coventry, are rising rapidly into view. The houses—of which there are 77—occupy one side of the river, and the other side is available for the erection of factories. The project is being carried out by Mr. G. Singer, of the Singer Cycle Co.

Mr. Passmore Edwards has offered £2,000 towards the erection of a Victoria cottage hospital at Acton, in commemoration of the Diamond Jubilee, on condition that some one else presents a site and that a local fund is raised for the endowment of the institution.

On Thursday in last week the new Wesleyan Church at East Finchley was opened for Divine worship. The building was erected by Messrs. McCormick, of Canonbury; and the architect was Mr. E. Hoole, of Finsbury-circus. It is Gothic in style, and seats between 600 and 700 people.

The central electric supply station of the Wallasey Urban District Council was formally inaugurated on Friday evening. The building adjoins the pumping station at Liscard. The works have been carried out at a total cost of £10,483, under the direction of Mr. J. H. Crowther, gas, water, and electrical engineer. Mr. J. Gourley was the building contractor.

The Rochdale Board of Guardians have under consideration a report and plans prepared at their request by Messrs. Butterworth and Duncan, architects, of that town, for additions at the rear of the workhouse, the estimated outlay being £3,000.

The Midland Railway Company is about to proceed with the construction of large provender stores at Saxby, upon its Peterborough and Leicester section. The company proposes to acquire eight acres of land for the erection of the buildings contemplated, which will be sufficiently large to contain food for from 4,000 to 4,400 horses.

It was reported to the Croydon Town Council on Monday night that the Local Government Board had sanctioned the borrowing of an additional £9,900 for electric lighting purposes, repayable in 25 years.

At a town's meeting at Portsmouth, on Friday, it was resolved to celebrate the Queen's Diamond Jubilee by rebuilding the Royal Portsmouth Hospital, the foundation-stone of which was laid by the late Prince Consort fifty years ago. It is proposed to erect a new building on the present site, to commence with a new block of sixty beds for male patients, estimated to cost £10,000. Of this amount nearly £2,500 were subscribed in the room.

## Engineering Notes.

**WATERLOO AND CITY RAILWAY.**—In their half-yearly report the directors of this undertaking, which is rapidly approaching completion, state that the expenditure for the six months was £67,337 2s., making the total outlay £280,526 8s. 5d. to the 31st December, 1896. The engineers' report as to the progress made with the tunnel works states that from the shaft near the Blackfriars Bridge towards Waterloo Station the northern or up tunnel has been driven throughout, and a junction has been formed with the tunnel works underneath the general offices of the South-Western Company. The southern or down tunnel is complete between the same points except for a length of 82 yards near the Waterloo-road. This length will be completed before the end of February, when both tunnels between the shaft in the river and Waterloo Station will be finished. From the shaft above referred to both tunnels have been driven eastward to the commencement of the City Station works—that is to the point at which a cross-over road will have to be laid within a tunnel 23ft. in diameter, so as to give access from both up and down tunnels to either side of the City Station platforms. The large shield has been erected, the cross-over road tunnel has been driven, and the shield is now being moved into position for driving the first of the City Station tunnels. The length of single tunnel driven during the past six months has been 370 yards, the greater portion of which has been under compressed air, and the total length of single tunnel driven since the commencement of the work is 4,306 yards. At Waterloo Station the site of the arrival and departure platforms of the low level station is ready for the platform walls, and the inclined roads from these low level platforms to those of Waterloo Station are in hand. The area for the terminal sidings on the south side of Aubin-street is now being excavated, and the retaining walls by which it is surrounded are making good progress.

The will of Mr. George Perry, 11, Brandenburgh-road, Gunnersbury, for many years the surveyor to the Charterhouse, who died on November 18th, has been proved by the daughter and Mr. George Alfred Perry, the son, the executors, the value of the personal estate being £1,261 15s. 8d.

An heroic-sized figure of the Saviour has just been completed for Lady Henry Somerset by Mr. Percy Wood. It is to be cast in bronze, and will be erected in a central position in the Temperance village at Duckshurst, Surrey, recently opened by the Duchess of Teck.

At the meeting, on Friday, of the shareholders in the Metropolitan Railway, the chairman announced that the Manchester, Sheffield, and Lincolnshire Railway expected to have their new line complete, and to be running their trains over the Metropolitan system by July, 1898.

The Prince of Wales has promised to formally open, early in May next, the south wing of the new Medical School Buildings at Guy's Hospital. The sum required for the erection of the new building, about £13,000, has been subscribed by the members of the staff and the teachers in the medical school. It comprises a lecture theatre and a physiological department.

A special application is to be made by the urban district council of Teignmouth to the Local Government Board for an early inquiry with reference to the borrowing of £7,500 for water supply improvements, with a view to the work being carried out before the season.

The members of the Gladstone family, as a thanksgiving for the extended years of life granted to their parents, intend to erect a memorial stained-glass window in Hawarden parish church. A design, drawn by Sir E. Burne Jones, representing the Nativity, with the Visit of the Shepherds and the Adoration of the Magi, has been accepted by Mr. Gladstone's sons and daughters.

On Saturday a body of London County Council workmen, under the protection of a body of police, demolished 6ft. or 7ft. of the frontage of premises in the Stoke Newington-road and Prince George's-road. The building was erected in defiance of the rejection of the plans by the County Council, who objected to the premises being built beyond the "building line." At the close of the pulling down very little of the shop was left of any practical use. The Council acted within the powers of the London Building Act, the High Court having given judgement in favour of the Council in March, 1896, on an appeal. The front of the house was taken away and the floors shored up, the landlord being left to do the necessary repairs.



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## ILLUSTRATIONS.

"THE JOURNEY OF THE MAGI."—MELROSE ABBEY.—ROYAL INSURANCE BUILDINGS, GLASGOW.—A DRAWING-ROOM CABINET.—STADHUIS OF ST. NIKOLAS, OOSTVLAAN-DEKEN.—ST. PATRICK'S CHURCH, BIRMINGHAM.—TWO PICTURESQUE AMERICAN BUILDINGS.

## Our Illustrations.

OLD MASTERS ON THE CONTINENT, NO. XLIV.: "THE JOURNEY OF THE MAGI," BY BENOZZO GOZZOLI.

A BIOGRAPHY of this famous master appeared in the BUILDING NEWS for July 27, 1894, written for us by Mr. Charles L. Eastlake, Keeper and Secretary of the National Gallery. We then gave a portion of the same series of frescoes as that from which our illustration to-day is taken. They are located in a curious and oddly-shaped room in the ancient palace of the Medici, the Palazzo Riccardi, Florence. The apartment is lighted only by one window, and metal reflectors have to be used to enable the visitor to study the work, which is very elaborate and beautiful, and is replete with details of costume and character. Benozzo Gozzoli was born in A.D. 1420, and died in A.D. 1498.

## MELROSE ABBEY.

THESE measured drawings of Melrose Abbey were submitted by Mr. Fred. J. Wass, of 1, Fingall-place, Edinburgh, in competition for the R.I.B.A. Silver Medal, which was awarded to the author.

## ROYAL INSURANCE BUILDINGS, GLASGOW.

THIS building, which is now nearing completion, is being erected for the Royal Insurance Company, and is situated at the corner of Buchanan-street and Royal Exchange-place. The stone is from Dunmore Quarry, and the building is fire-proof throughout. The entrance to the company's offices is at the south-west corner of Buchanan-street, and is composed of two private rooms, room for the typewriters, with separate lavatory accommodation, a large public office, and a spacious basement, well lit, and separate lavatory accommodation for agents and assistants. The rest of the building is occupied as offices and shops. The architects are Messrs. John Thomson and R. Douglas Sandilands, of Glasgow.

## A DRAWING-ROOM CABINET.

IN this design for a drawing-room cabinet an attempt has been made to infuse new spirit and freshness of detail upon a constructional basis, after the manner of the German Gothic, but, while keeping the old tradition in view, to produce something quite different. The design is by Mr. H. D. Richter, and to it a bronze medal was awarded in the National competition.

## THE TOWN HALL OF ST. NIKOLAS.

THE former town hall of this thriving industrial town, situated in that part of East Flanders

called the "Pays de Waes," was an ugly building of the last century, possessing no artistic character, and very inconvenient in plan. It was totally destroyed by a great fire which broke out among the military stores preserved in the lofts, and which spread with such alarming rapidity that no hope could be entertained of preserving the building. Accordingly, a new town hall had to be built, and the design was thrown open to competition to all the architects of the country. Twenty-one designs were sent in, amongst which was one by Mr. Peter van de Kerkhove, a native of Limbeke, near Eccloo, and a student of St. Luke's Christian Art Academy in Ghent, where he had greatly distinguished himself. On account of the excellent arrangement of the plan, his design was placed first, and was eventually accepted by the town council, since the architect had agreed to execute it for £12,000, the limit of the amount at their disposal for the purpose. The building was finally erected and was opened by the King and Queen of Belgium in person. The style of the building is Flemish Flamboyant of the 15th century. Without copying any existing example, the aim of the architect was to realise the spirit and principle of construction of the ancient town halls for which Belgium is celebrated. In the centre is the belfry, containing the principal entrance, over which is a closed gallery, from which, according to ancient custom, proclamations can be made to the people assembled in the square below. On the ground floor of the building is a great entrance-hall, surrounded by the different municipal offices; this is approached from the square by double flights of steps. The one story is occupied by a large council chamber, a museum of prehistoric antiquities, and other offices. A doorway at the foot of the tower leads to the central open court, on the far side of which are the law courts. In the basement story to the right of the tower are the police offices. The building occupies the site of the former town hall, and stands in a large open square. The success which his design for the town hall of St. Nicolas, and those of several other large architectural works of less importance undertaken by him met with, procured for Mr. Peter van Kerkhove the appointment of Architect of the Province of East Flanders, which post he filled to the great satisfaction of the government till his premature death in 1889. Among the principal restorations of buildings executed by him, we may mention that of the manor of Looendeghem, near Ghent, that of the manor of Jamoigne in the province of Belgian Luxemburg, and that of Ghent Cathedral.

There was a considerable improvement in business at the Auction Mart last week, the supply generally having been of a more saleable character. The aggregate returns for the week amount to £56,590, the largest as yet recorded this year, and approximating very closely to those of the corresponding week last year (£56,184).

At the annual meeting of the Improved Wood Pavement Company (Limited), held on Monday, Mr. Benjamin Tabberer, who occupied the chair, moved the adoption of the report and the payment of a dividend of 10 per cent., stating that the company had done considerably more work in the past year than in any previous year; but they had had to be contented with less profits owing to extremely keen competition. Nevertheless, they were able to maintain their dividend. Last year they cut 8,000,000 blocks for paving, about three-fourths of which were Baltic wood, the remainder being hard wood. Probably these proportions would fluctuate, and the tendency now was towards the use of hard wood, notwithstanding its extra cost.

The South-Eastern Railway Company has deposited an estimate of the capital expenditure to be incurred in the event of its Bill of the present Session receiving sanction. The total expenditure required is £782,826, of which the proposed relief railway 1½ mile in length, commencing in Horselydown and passing through Bermondsey and Rotherhithe to a junction with the company's railway in Deptford, is estimated to cost £438,194. With the exception of £9,283, which will be expended upon widenings at Tonbridge, the whole of the balance of £335,349 will be spent upon widenings between Charing Cross, Waterloo, and Cannon-street, and between London Bridge, Bermondsey, and Deptford.

Dunecht House, near Balmoral, has just been sold by the Earl of Crawford and Balcarres to a syndicate, whose object is to establish a college for young men on unsectarian principles. The price was £34,000, although over £100,000 was originally paid for the estate.

## THIS BEATS ALL!

IT does indeed! Enterprise in the Black Country is keen, judging from an advertisement and a type-written circular sent us by a Walsall correspondent. The first is cut from the *Walsall Observer*:—

1897.—THIS BEATS ALL.—SPECIAL NOTICE TO THE PUBLIC.—A want successfully supplied, now within the reach of all, the Improved Rubbing and Washing Machine for every home, easily, quickly, and thoroughly cleans every kind of strong or delicate fabrics. Read this.—Maiding, tearing, and hand-rubbing dispensed with. Guaranteed to save two-thirds of the usual time, materials, and labour. Every home should possess one. Testimonials on application. The most wonderful value for 39s. 6d. at works, sycamore, beech, with brass fittings, best make. Extra with wringer, or hire-purchase extra. Trade supplied. Sole inventor and manufacturer, Edward W. Margetts, architect, &c., Rockholm, The Heath, Stourbridge. N.B.—Builders' working plans, full specifications, complete, at prices to suit gentlemen and the working man, for houses and other buildings. All kinds of wringers and other household machinery, &c., repaired and put in working order at a small cost. All kinds of wood-turning for builders, contractors, cabinet-makers, and others, single articles, or large quantities—any design—at moderate prices. All kinds of woodwork for the home and joinery for buildings, &c., at reasonable prices. Orders respectfully solicited. Note the address:—Edward W. Margetts, Architect and Manufacturer, Rockholm, The Heath, Stourbridge.

The type-written circular is as follows:—

\* \* \* \* \*, architect, agent for fire and plate-glass insurance, \* \* \* \* \*, Walsall. Fees:—Plans, tracings, specifications, and oversight, 2½ per cent. commission on cost; ditto, ditto, without oversight, 1½ per cent. commission; oversight only, 1 per cent.

We omit the name and address in the circular, because we have no evidence before us that it has actually been sent out, and therefore it is scarcely public property. We congratulate the enterprising "architect," however, on his benevolent disposition to work for next to nothing.

## CHIPS.

The town council of Faversham have just raised the salary of the borough surveyor from £80 to £150 a year.

Commander F. Martin Norman, R.N., J.P., is about to present to Berwick, where he resides, a drinking fountain, to commemorate the record reign of Queen Victoria. The fountain, which is to stand 16ft. in height, is of granite, and will cost £500. The town will expend another £100 in its erection on a site near the Scotsgate, close to the old walls.

Mr. Walter A. Ducat, a Local Government Inspector, held an inquiry at the Council Offices, Clevedon, Somerset, on Friday, in relation to an application made by the urban district council to borrow £1,675 for the purposes of street and bridge improvement.

Mr. O. T. Gibbons, of the Eastbourne Corporation Flood Prevention Works Department, has been appointed assistant manager to the London County Council for the sewerage department.

Mr. Walter Rothschild will lay, on Sunday week, the 14th inst., the foundation-stone of the South Hackney Synagogue and Class Rooms, which are being erected from the designs of Mr. Delissa Joseph.

A large number of men are engaged in unloading the tunnel on the South-Eastern Railway at the Warren, on the Dover side of Folkestone, where the extensive landslip took place recently. The tunnel is to be converted into a cutting. An enormous quantity of soil has to be shifted.

The County Council was, by the verdict of a jury in the Queen's Bench, ordered, on Friday, to pay damages to the amount of £280 to two men whose trap had been upset by a bank of sand left unprotected at Fulham by the Council's servants.

In accordance with the awards by the assessor in the competition for plans for a new church for St. David's, Exeter, a cheque for £100 has been paid over to Mr. Caroe, who received the first premium, and £50 to Mr. Harbottle Reed, whose designs came second. The other competitors receive £25 each.

The new Pavilion Theatre is now in course of being completed in Grove-street, Edinburgh. The building is constructed of brick and iron, with a view, as far as possible, of making it fireproof. In height two stories, the building is plain externally, and seats an audience of about 1,200 people. The low-pressure system has been so adopted that one part of the theatre can be heated independently of the others. On the ground floor there is accommodation for about 700 people, and in the circle seats are provided for about 400. The stage, which in the event of fire can be screened off from the auditorium by a fireproof curtain, is 25ft. deep, 48ft. wide, and has a proscenium opening of 27ft. by 18ft. Throughout the theatre will be lighted by electricity





### ST. PATRICK'S CHURCH, BIRMINGHAM.

**T**HIS Roman Catholic Church of St. Patrick, Dudley-road, Birmingham, opened in 1895, is a building 100ft. long and 50ft. wide, consisting of nave, chancel, and aisles, terminating in two chapels. The confessionals, of which there are three, form a part of the main structure. The church is internally finished in plaster, with boldly moulded Codeall stone arches, supported on Corshill stone columns with moulded caps and bases. Carving has been sparingly introduced. Externally the materials used are hand-made tapped common bricks with redstone dressings. The roof of the turret is in stone, and the remaining roofs are covered with tiles.

The contractor for the works was Mr. John Bowen, the heating was by Mr. Henry Hope, the internal wrought ironwork partly by Messrs. Thomas Brawn and Co. and partly, including the gasfittings, by Messrs. Hardman and Powell, and the whole has been carried out from the designs, and under the superintendence of, Messrs. Dempster and Heaton, the architects, all of Birmingham.

The extended and modernised sewerage works of the Birkdale Urban District Council were formally inaugurated on Friday. The effluent will pass, after "international" treatment, through new filter beds and the farm land, into Fine Jane's Brook, and is expected to cause no further trouble to the Southport Sanitary Authority.

The Burntisland Harbour Commission have just placed a contract with Sir John Jackson for considerable extensions of their dock system, including an outer breakwater with new deep lock, from designs which have been prepared by Messrs. Thomas Meik and Sons, civil engineers. The estimate for the works is a little over £300,000.

### THE HOUSING QUESTION IN COVENTRY.

**T**HE difficulty of finding accommodation for the great numbers of artisans who are being attracted to Coventry by the prosperity of trade is still increasing. Preparations are being made to carry out extensive building schemes in several parts. In the Red-lane district nearly a thousand houses are to be erected by a syndicate; a new street is being constructed by Alderman Singer between Gosford-street and Lower Ford-street, and plans have been passed for 170 houses; the New Beeston Cycle Company propose to erect upwards of 100 dwellings in the neighbourhood of their works; several streets are being constructed at Earlsdon, and some scores of houses will be erected there; a small building estate is being opened up near St. Thomas's Church. It is believed that even this extensive provision will be insufficient, and that double the proposed number of houses could be occupied immediately, as the city is admittedly in a most overcrowded state. There are hundreds of workmen who leave for the week-end, and would be glad to remove their families into the city at once. The special committee of the council who have been appointed to prepare a scheme for housing inhabitants rendered homeless by action under the Sanitary Acts have instructed Mr. H. W. Chatterway, architect of that city, to prepare plans, in conjunction with the city surveyor, for a block of buildings on the flat system to accommodate from forty to fifty families. The flat system is not regarded with favour by the artisan classes, however, and the Trades Council, who have interested themselves in the housing question, have appointed a sub-committee to watch the matter. It may be observed that this provision is made

with a special object, and is, of course, limited to meeting a special difficulty. The question of temporary provision is a pressing one, and it is now proposed by Messrs. G. Loveitt and Sons, auctioneers, on behalf of clients, to take the old baths in Hales-street, as they stand, for a year, with the option of renewal for a second year, at a rent of £100 per annum, the tenants paying rates and doing all repairs, and being allowed to make necessary alterations of a temporary character, the premises being required for the temporary housing of workpeople. The Estates and Finance Committee propose to accept the offer, subject to a reservation of the right to use the well and pumping machinery for street watering.

### CHIPS.

The annual dinner of the Society of Architects will be held at the Hotel Cecil, Strand, on Tuesday, the 23rd inst.

The new Catholic Church of St. Joseph's, Frizington, was opened on Wednesday week. The new church is in the Gothic style, and has seating accommodation for 400 people.

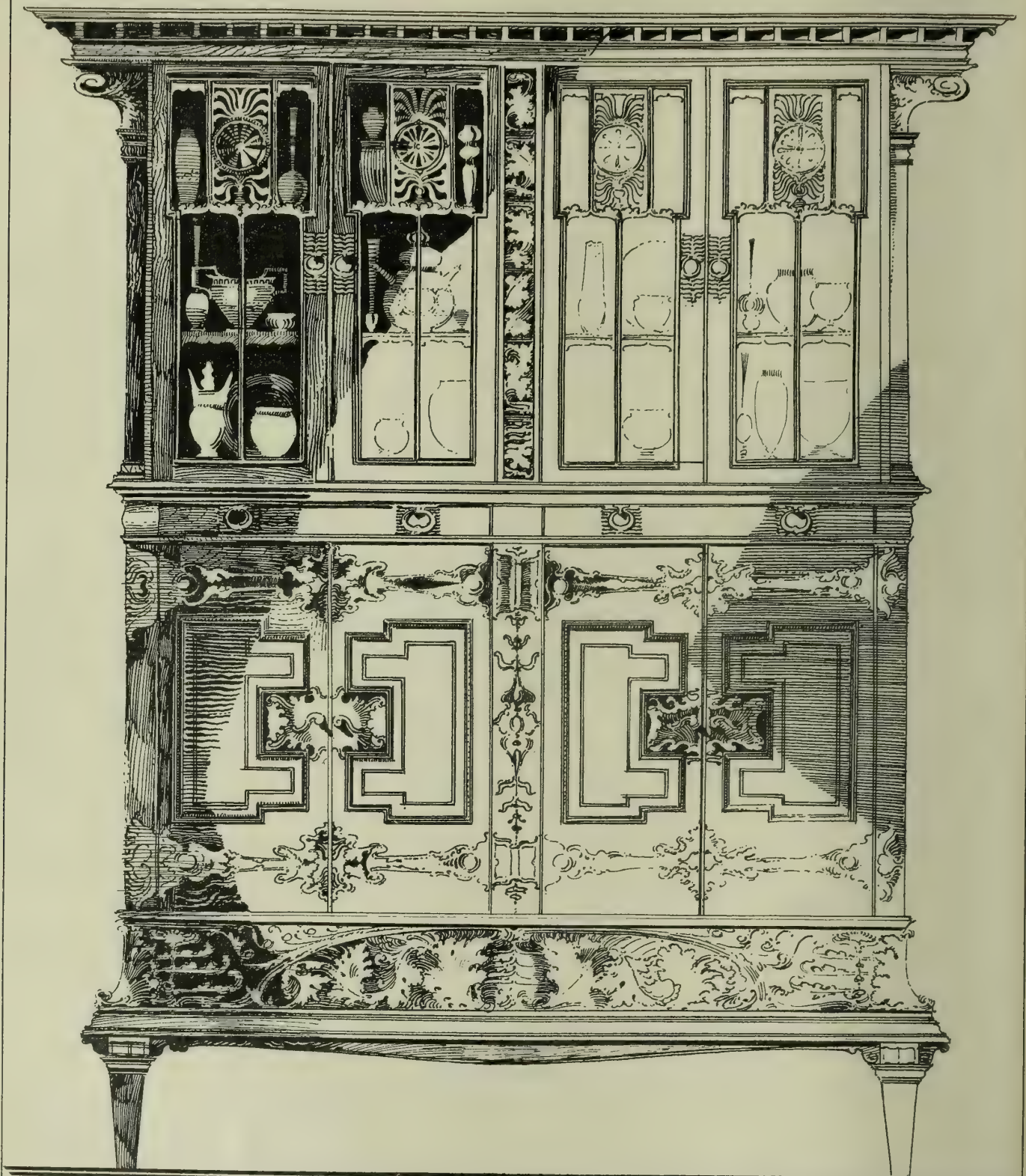
At the last meeting of the City Court of Common Council, it was stated that extensive alterations and improvements were contemplated in the buildings of the City Lunatic Asylum.

Soon after rising on Thursday morning in last week, Mr. Vincent Gray, builder, of Wood-street, Barnet, was taken ill, and was on the point of returning to bed when he fell and expired. Mr. Gray, who was 68 years of age, came of an old family of builders in the town. Of retiring disposition, he took no part in public affairs, but to the last he maintained a keen interest in the Wrotham Lodge of Oddfellows.

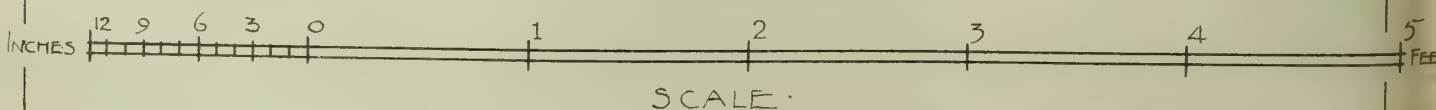








A · DRAWING · ROOM · CABINET ·  
NATIONAL · BRONZE · MEDAL · DESIGN · BY · H · D · RICHTER ·



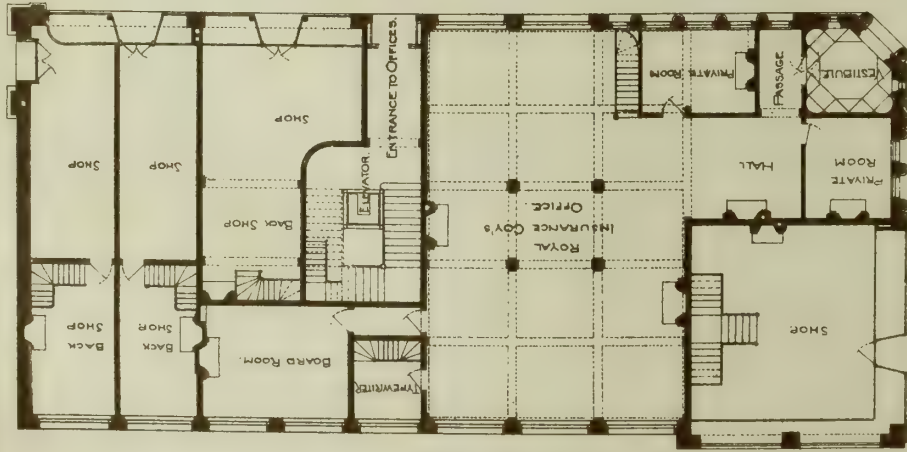




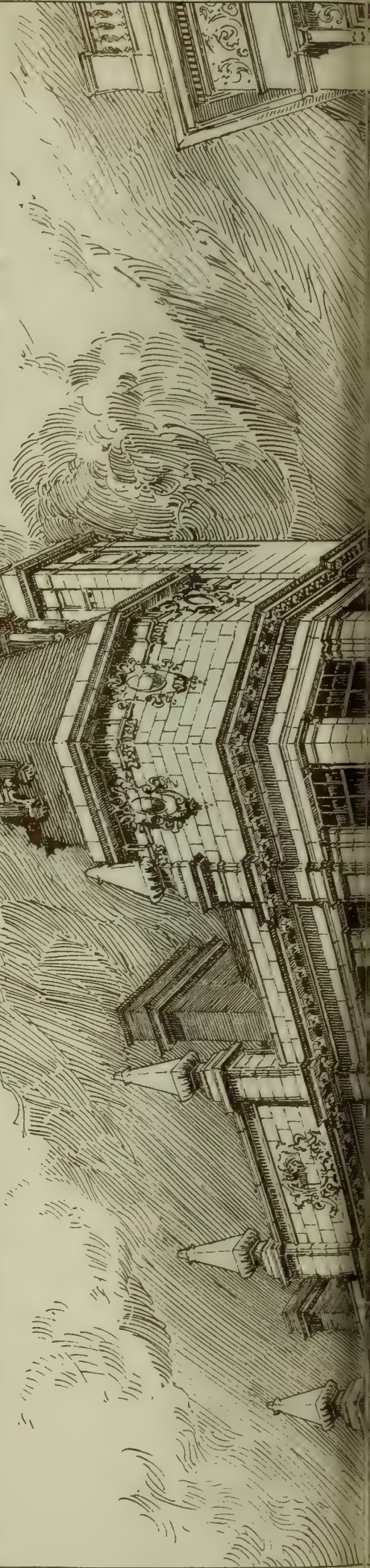
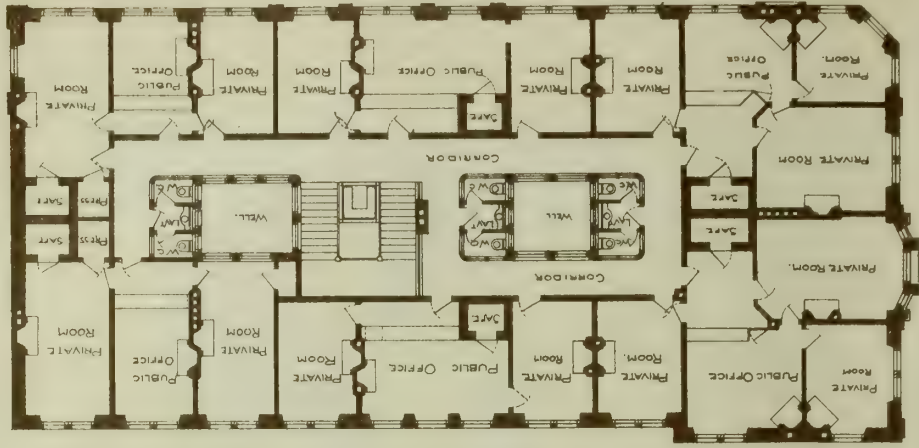


Royal Insurance Buildings  
· Buchanan Street ·  
Glasgow

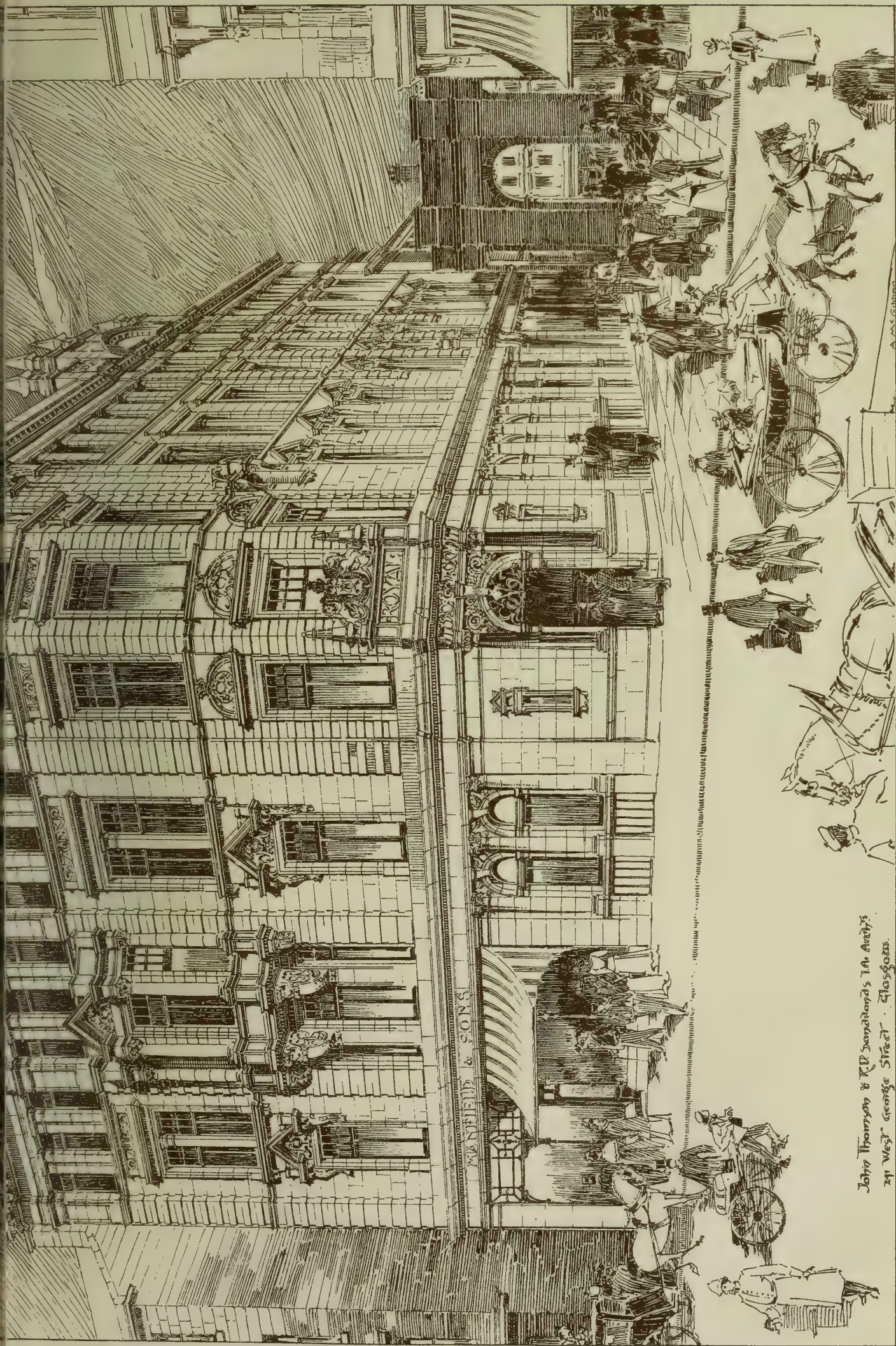
SCALE 1/4" = 10' 0" FEET  
GROUND FLOOR PLAN



SCALE 1/4" = 10' 0" FEET  
SECOND FLOOR PLAN







John Thomson & Co. Lithographers T.A. Archer's  
21 West George Street Glasgow.

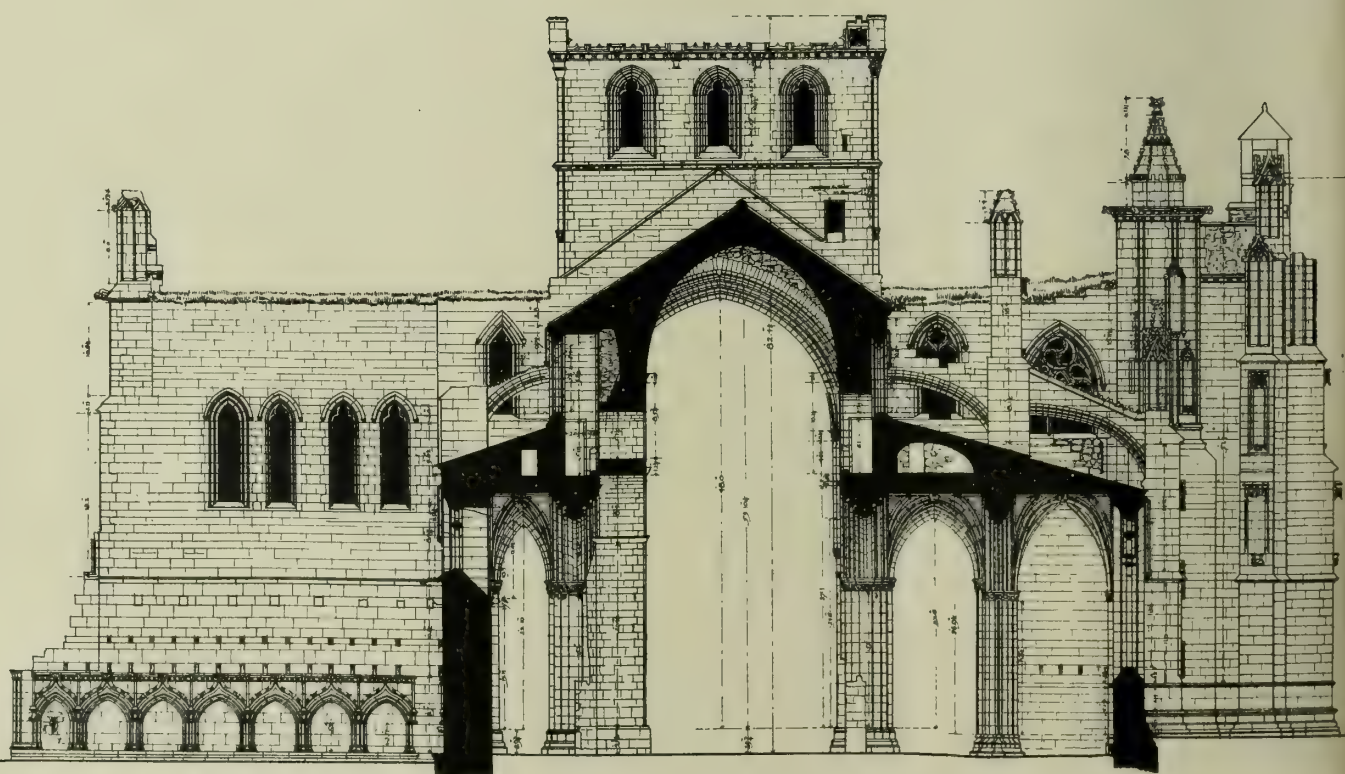
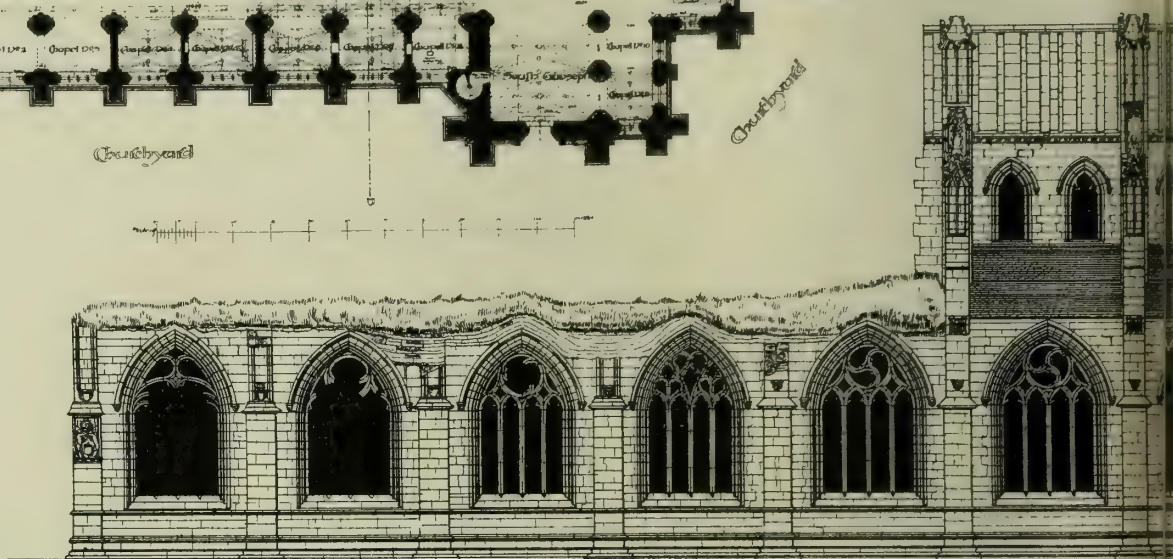
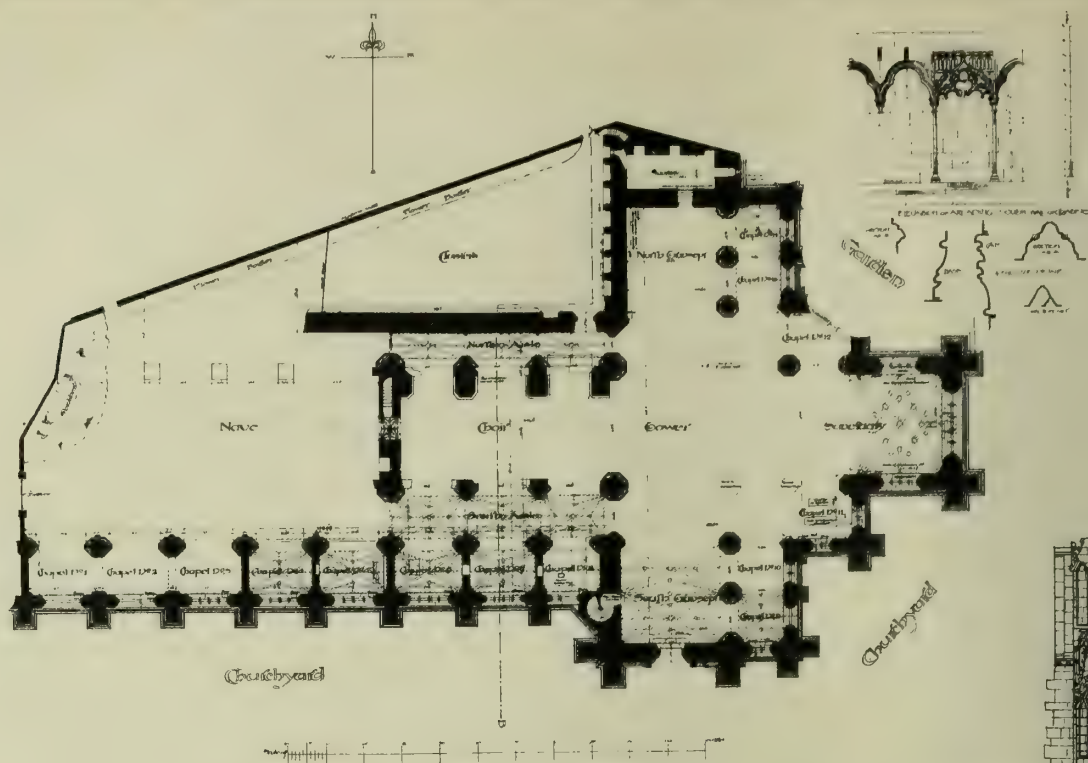












Section AB

Scale of





FEB. 5, 1897.

R.I.B.A. SILVER MEDAL FOR MEASURED DRAWINGS  
PRIZE DRAWINGS BY FRED J. WASS.

# MELROSE ABBEY

## Elevations and Section



North Elevation



East Elevation



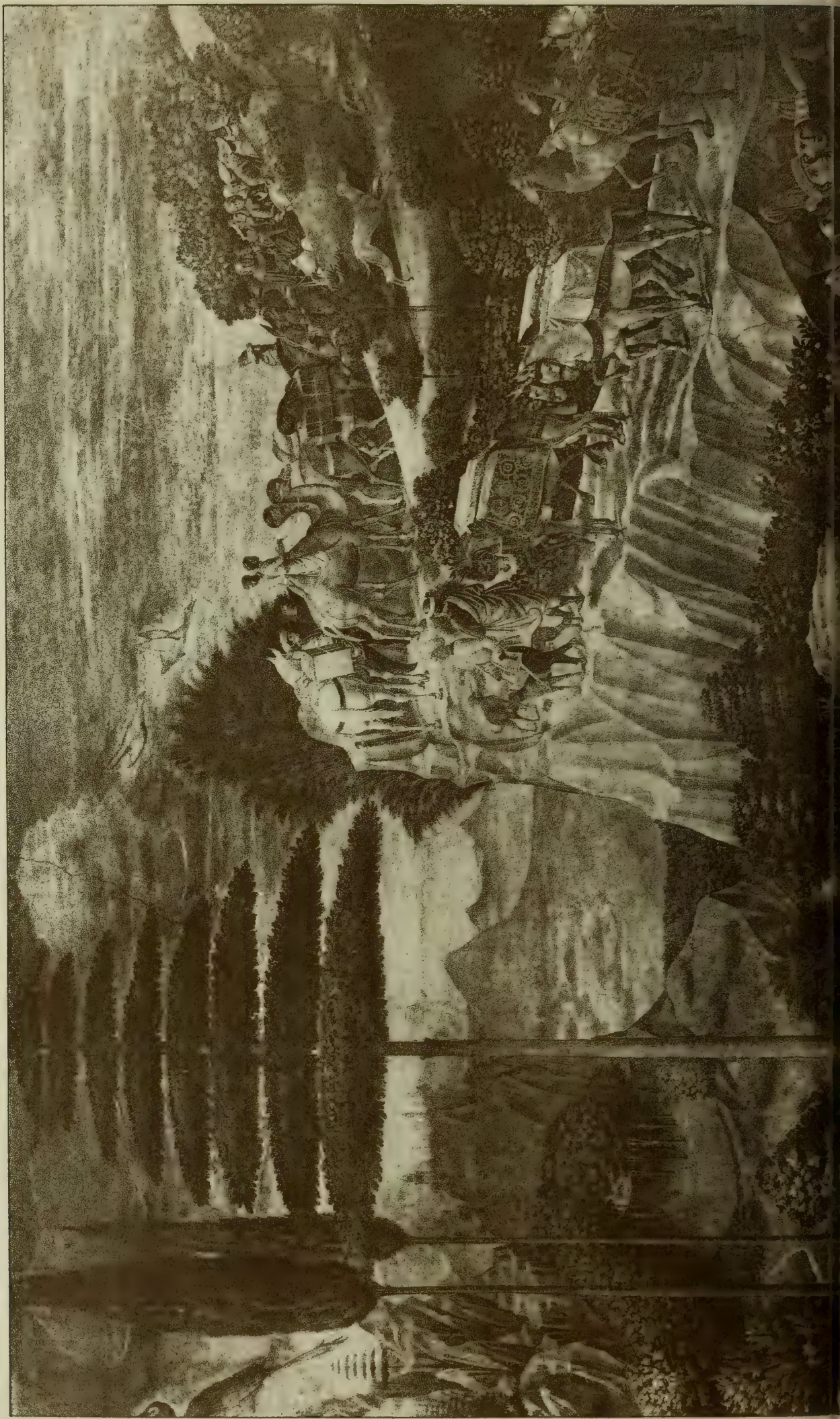








THE BUILDING NEWS, FEB. 5, 1897.







"PHOTO-TINT" by James Akerman 9, Queen Square London, W.C.

OLD MASTERS · ON THE · CONTINENT · N° 44 ·

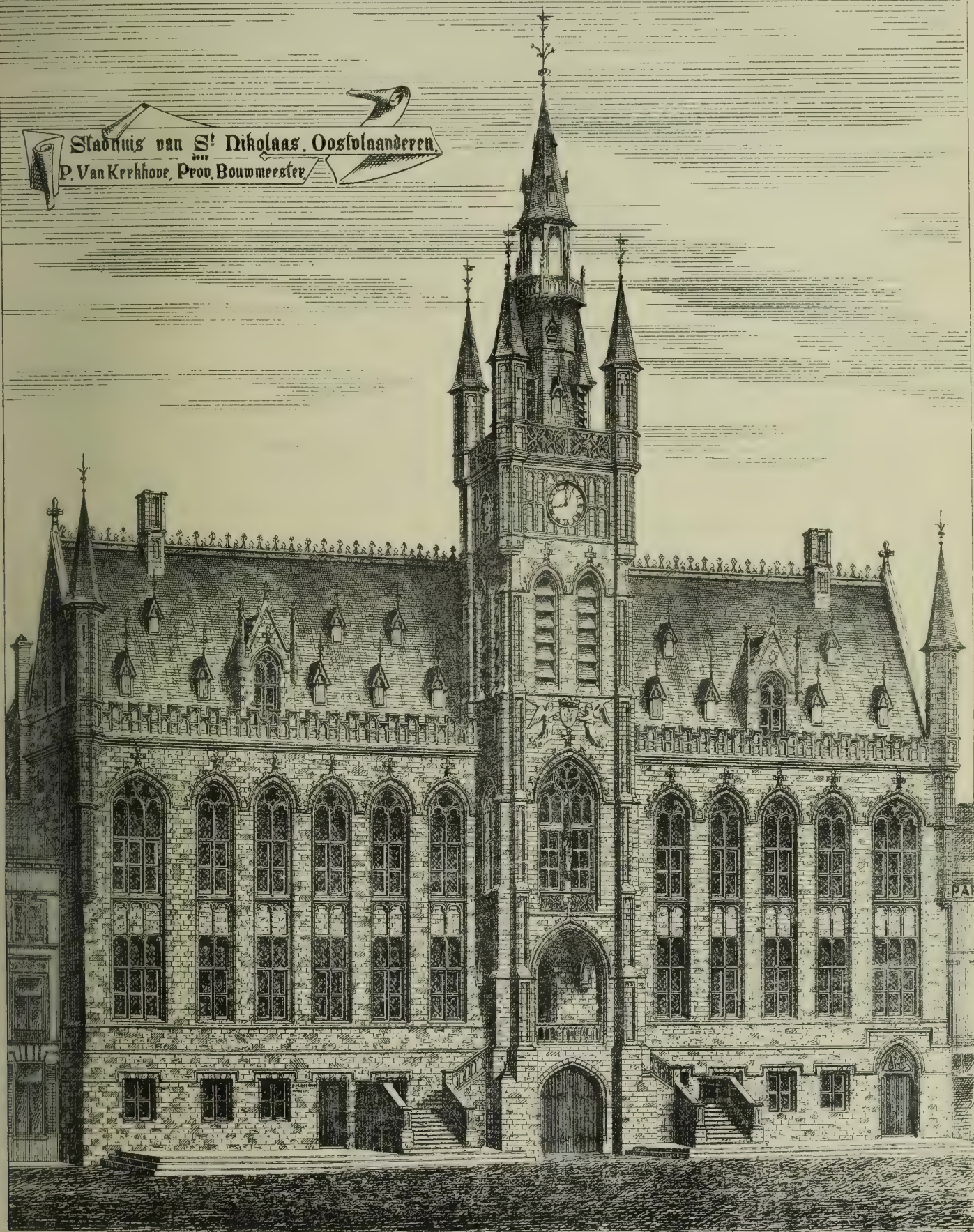
THE · JOURNEY OF THE MAGI · (FLORENCE) BY BENOZZO GOZZOLI (B 1420 · D 1498) TUSCAN SCHOOL ·







Stadhuis van S<sup>t</sup> Nikolaas, Oostvlaanderen  
P. Van Kerckhove, Proj. Bouwmeester











## TWO PICTURESQUE AMERICAN BUILDINGS.

JOHN A. FOX ARCHTCT  
EASTERN POINT, GLOUCESTER  
CHURCH OF OUR LADY OF THE SEA  
MAINE  
J. A. SCHWEINFURTH ARCHT

### TWO PICTURESQUE AMERICAN BUILDINGS.

THESE two very dissimilar buildings, by two different architects, are selected for their recognition of the picturesque, and both are thoroughly American in their treatment. There is not much beyond this to say about either of them other than that which can be seen from the sketches illustrated. The hotel is at Eastern Point, Gloucester, by Mr. John A. Fox, architect; and the Church of Our Lady of the Sea is situate by the shore at Maine. Mr. J. A. Schweinfurth is the architect. The sketches shown are borrowed from the *American Architect*.

The electric lighting committee of the Hull Corporation have made a profit of nearly £2,000 on the year's working of the installation. An extension is about to be made, and when the whole of the plant is in full work the ratepayers will be given the advantage of future profit by the reduction of charges for supplying the light.

### A BRICK COUNTRY ROAD.

THE first brick country road laid in the United States has been put down in Monmouth township, Warren County, Ill. The road is the culmination of a series of experiments in road-building, and though it is regarded as more or less on probation, the utmost confidence in its success is expressed. When hard road-building began in the township, four years ago, it was decided to expend the money on hand in an experimental way. Monmouth township had long been a sufferer from bad roads. In winter the town had often been completely blockaded by mud too deep for waggons. Even within the town itself the streets were so poor that at times the "bus" lines were obliged to suspend business, and mails and baggage were carried to the railway station on wheelbarrows. The manner in which the road-way was laid is described as follows:—The ground was prepared for it by grading and being allowed to stand for two months. It was treated to an occasional scraping, so that it would pack evenly,

and when the contractors were ready to lay brick it was as hard and even as a floor. The first thing was setting the kerbing. This was made by 2in. by 6in. oak plank, set 7ft. apart, and held by oak stakes 18in. long, and put down every 4ft. Inside this was put a 5in. bed of sand. This was evened up, and the single course of No. 1 paving-brick was put down. They were set on edge, and make a fine roadbed. Outside of the kerb 2ft. of crushed rock was laid, graded up to make an easy approach. This makes a road 11ft. wide. The earth on each side was graded and worked, making it all 40ft. wide, and affording tracks on each side for use in dry weather. The average cost of the stone roads has been 70 cents per foot. The brick road cost 2,600dols. for 3,000ft., or about 90 cents a running foot.

The new cemetery at Marazion is being completed, and will be consecrated during March. The contractor for the walls and gates, &c., is Mr. H. Thomas, of Penzance.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

## TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—B. R. and C. M. Co.—S. P. B.—B. F. T.—S. W.—T. W.—P. I. Co.

"STABLE CONSTRUCTION AND SANITATION." (In reply to "Enquirer," 12,500c.ft. should be considered as the minimum to be supplied (and conversely to be extracted) per horse per hour. This quantity should, therefore, be removed by the foul-air shafts, the fresh-air inlets being proportionately increased, for reasons which will be hereafter mentioned. The remarks you quote must be considered as merely the introduction to the subject, for the relative sizes of the fresh-air inlets and foul-air outlets will be fully discussed in the next and following articles of the series.)

## Correspondence.

## WATER DISCOVERED BY MEANS OF THE DIVINING ROD!

To the Editor of the BUILDING NEWS.

SIR,—A few weeks ago I noticed a half-page advertisement in the BUILDING NEWS having the above heading. It may be of interest to some of your readers if I give them my experience of the use of the so-called "divining rod," and the opinion I formed as to its efficiency. During a recent dry summer I was anxious to find a good supply of water on an estate. A local divining professor hearing of this, called upon me and offered his services for a consideration, and out of curiosity I allowed him to try his power, stipulating that I should be present when the trial took place. The appointed day arrived, and the diviner. He set to work by cutting from a hedge a forked hazel, or nut-bush twig, the limbs of the fork being about 16in. long, and a little thicker than the stem of a briar pipe. He then grasped the twig at the extremity of each limb of the fork, the palms of the hands being turned upwards, and the tips of the fingers inwards, towards the body, and set out to walk steadily over the ground selected. At first he held the rod loosely, but as the hidden influence began to be felt, he tightened his grasp, and the limbs of the

twig commenced to twist and bend outward, and presently the twig turned completely over and pointed perpendicularly to the earth, and marked, as he said, the site of water. I then cut a similar twig to that the diviner was using, and walking over the same ground in the manner he had done, found that my rod moved as his had, but not so decidedly. Being sceptical, I blindfolded the man, and turning him around several times, requested him to again try his power. On this occasion he walked off at a tangent to his original course; but his twig marked again at another spot, which, he explained, was the course the water took underground. I then led the man, still blindfolded, from spot to spot; but on each occasion that he passed over the old marks, his rod failed to move! This proved to my mind that eyesight is more important to diviners than their rod. I will now explain what I believe to be the cause for the movement of the twig in as few words as possible. Take in your hand a forked brush in the diviner's manner, and it will be seen that the limbs are equivalent to two boughs tied together at the extremity, and when they are bent outwards they exert a force in opposite directions upon the point of union with the stem. Held thus, the forces are equal, and no motion is produced. Keep the arms steady, and then turn the hands, from the wrists, very slightly inwards, and the point of the twig must move. If the limbs be held very tightly whilst this movement is made, so that the rod cannot turn, I found that the bark burst, and the wood twisted and broke under the action of opposing forces. Anyone can convince himself of this solution of the mystery of the divining rod by tying two stout quills together at the tips, and holding them as already described, or two pieces of whalebone, which may be the substance which is being used by your advertiser in the photo. of him given in your paper.

Some professing water-finders pretend to determine the depth at which water will be found. To do this they retire slowly to a short distance from the site of the marked spring, and then advance again slowly, and at the moment the rod begins to work they mark the spot. This experiment is repeated all round the site, and the diameter of the circle thus formed is taken as double the depth to the water; say the water is 7ft. below, then the diameter will be 14ft. But, strange to say, if the water be seven times 7ft. below the surface, then the rod points within a circle seven times larger, or, in other words, the attraction increases with the distance!—I am, &c.,

NEMO.

## PETERBOROUGH CATHEDRAL RESTORATION.

SIR,—There can be no doubt, I think, about the half-hearted way in which the Council of the R.I.B.A. decided to treat this matter, and their short-sightedness has caused warm indignation among some of the members of that body, while strong language seems, from all accounts, to have been used as to the folly of the Council giving way to a small minority on their board, and then, by a large majority, sending in a quasi-private protest to Mr. Pearson before separating after they had dined together. Either the Council represent those who elected them or they do not; and a manifesto of this kind, however informal it may seem to those who signed it, cannot be regarded as a purely personal and private affair.

The following lines, written fifty years ago, and published by Sir Gilbert Scott, seem apropos to the work now in hand at Peterborough:—

It were a pious work, I hear you say,  
To trop the falling ruin, and to stay  
The work of desolation. It may be  
That ye say right; but O! work tenderly!  
Beware lest one worn feature ye efface;  
Seek not to add one touch of modern grace;  
Handle with reverence each crumbling stone,  
Respect the very lichens o'er it grown;  
And bid each ancient monument to stand  
Supported e'en as with a filial hand.  
'Mid all the light a happier age has brought,  
We work not yet as our forefathers wrought.

And the same great restorationist added, on the same occasion:—

Ye on ancient wall—  
Better to see it tottering to its fall  
Than decked in new attire with lavish cost,  
Form, dignity, proportion, grace, all lost!

Half a century has passed away, and we see an old assistant of Sir Gilbert Scott aiding in the ill-considered onset against Mr. Pearson, and, at the same time, actually advocating a so-called laminated concrete backing to uphold the rotten

ashlar facing of the west front of Peterborough Cathedral! If not so serious, it would be really funny.—I am, &c.,

AN ANTI-RESTORATIONIST.

## CHIPS.

Mr. Thomas Binnie has been elected Chairman of the Scottish Committee of the Surveyors' Institution, which has just been formed. The organisation is now established all over the United Kingdom.

It is proposed to add a chancel to the Swenborgian Church in Henry-street, Bath, as a memorial of Sir Isaac Pitman, the Father of Phonography.

On Saturday, a new board school was opened at New Park, Harrogate. The schools have been erected on a site containing 4,840 square yards, with a frontage to Ripon-road of 188ft. The building will accommodate 500 scholars, and consists of large central hall, classrooms, infants' room, cookery-room, &c. The cost (including master's house) is £6,100.

At the last meeting of the executive committee of the Archbishop Benson Memorial it was decided to recommend to the general committee, at a meeting to be held shortly, that a sum not exceeding £2,500 be set apart for the Canterbury monument, and that the balance of the fund should be devoted to some definite portion of Truro Cathedral.

The President of the Board of Trade has appointed a committee, with Major Marindin as chairman, to inquire into the subject of tunnel ventilation on the Metropolitan Railway.

The annual dinner of the Surveyors' Institution will be held on Wednesday, the 24th inst., at the Victoria Hall, Hotel Cecil, Strand.

Mr. Thomas Elsley informs us that his business has been converted into a limited company. Shares are not offered to the public. He also states that the business has now been entirely removed to premises adjoining his fireplace factory. The name of the firm will be Thomas Elsley, Limited, and the office address, 28, Great Titchfield-street.

There was offered for sale on Tuesday at the Mart, Tokenhouse-yard, the freehold site formerly occupied by the historic mansion known as Cleveland House, 19, St. James's-square, embracing an area of 11,300sq.ft. The house itself has been completely demolished, the portico alone remaining. The property is subject to a perpetual annuity of £16 19s. 2d. per annum. The bidding started at £40,000, and reached £57,500, at which price the property was withdrawn. The purchase price was £65,000.

The partnership heretofore subsisting between H. G. B. Ridges and A. North, architects, surveyors, and estate agents, Worthing, under the style of Ridges and North, has been dissolved.

Mr. Charles Roberts, who died on Tuesday, at Berrie Dale, Church End, Finchley, in his 95th year, was for forty years in the Public Record Office, where he held the position of secretary. He retired thirty-one years ago.

At a meeting of the Sewage Committee of Glasgow Corporation on Monday, a sub-committee was appointed to arrange for the experimental treatment at Dalmarnock of the city sewage by perchloride of iron instead of alumina, as heretofore, in order that comparative results may be obtained.

The new County School, Portmadoc, is being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. George Fabian, late a surveyor on the Royal Engineers' Civil Staff, Horse Guards' Office, Whitehall, died on Friday last at his residence, Winton Villa, Geraldine-road, Wandsworth, aged 78 years. He was in her Majesty's service at home and abroad for 39 years.

The trustees of the Park Congregational Church, Ramsbottom, have adopted plans for a new church, which is to seat 450 persons and cost £1,800.

The Primitive Methodist Chapel in Canal-street, Carlisle, was reopened last week after extensive renovations and alterations, carried out from plans and under the supervision of Mr. H. Higginson, architect, of the same city. The chief contractors are:—Builder, Mr. John Laing, Denton-street; joiner, Mr. James Little, Caldewgate; slater, Mr. Hewitson; plumber, Mr. Anderson, Lowther-street; plasterer, S. Ferguson and Son, Denton-street; painter, Mr. R. Kirk, Lonsdale-street; all of Carlisle.

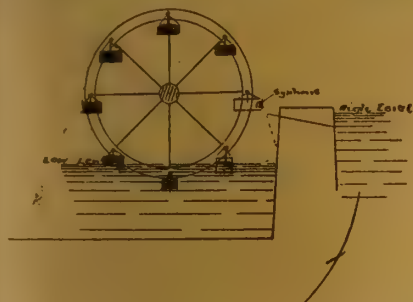
A three-light stained-glass window has just been placed in the south aisle of St. Nicholas parish church, Sevenoaks. The window is from the studio of Mr. C. E. Kempe, 28, Mottingham-place, London, and the details are somewhat similar to those of other windows in the church which came from the same artist. The lights represent St. Anselm, St. Leo, and St. Augustine.



## Intercommunication.

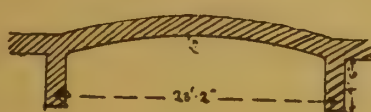
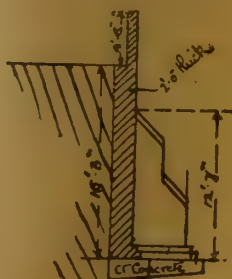
### QUESTIONS.

[11615].—**Sewage Lift.**—Could a wheel, if built on the principle given in sketch, be applied practically for raising sewage or liquid from a low level to a high level?



The suggestion is taken from the Earl's Court wheel; but in place of the cars would be substituted flushing tanks, with several siphons to each tank arranged so as the liquid would discharge automatically upon a valve being opened on reaching the desired level.—ORIGINAL.

[11616].—**Buttressed Wall.**—Will some reader kindly inform me of the correct method to determine the stability of a brick buttressed wall of dimensions given



below? I have worked as follows: First find centre of gravity of buttress, then find centre of gravity of portion of wall between buttresses, and afterwards the common centre of gravity of the two. Then find weight of length of wall and of one buttress, and divide total by length (centre to centre of buttresses). Result equals downward force in cwt. per foot run. Afterwards proceed as in an ordinary retaining wall. If portion of wall is arched thus, will the above method apply, or what is the formula for finding requisite thickness of arch?—FOUNDRY.

[11617].—**Window Cleaning.**—Will feel much obliged if any reader can let me know of some simple and safe arrangement of balcony for cleaning outside of windows with up-and-down sashes, where there is no projecting sill outside. Something moderate in price, light, and easily moved from one window to another is what I require.—G. P. B.

### REPLIES.

[11610].—**Quantities.**—(1) Quantity surveyors' charges vary according to the standing and professional reputation of the surveyor; but are seldom more than 2 per cent. It also varies with the description of the work, School Board work very often paying much less. (2) The lithographed copies are always an extra. (3) Very few surveyors of any standing (with anything to lose) accept absolute responsibility for their work, which, with a dishonest person, would be taken advantage of; but most surveyors would pay for any errors caused by their own neglect or their clerk's.—W. HOFFMAN WOOD, Park-square, Leeds.

A new organ, built at a cost of £2,000 sterling, by Messrs. Merklin et Cie., of Paris, was formally opened at Boulogne Cathedral on Sunday.

In the list of adjudications in bankruptcy in Tuesday's *London Gazette* the name appears of Edwin Clarke, of Nottingham, architect and surveyor.

Messrs. Driver and Co. have let on building lease for a term of 80 years the site of Hanover Chapel, having a frontage of about 75ft. to Regent-street, and containing an area of 6,666sq.ft., at a yearly ground-rent of £2,120. This gives a rental value of 6s. 4d. per square foot, and this ground-rent, capitalised at 30 years' purchase, equals £415,000, or nearly half a million per acre.

At Queen's-road Baptist Chapel, Coventry, a new organ, built by Messrs. Norman Brothers and Beard, of Norwich and London, was opened on Wednesday week. The designs for, and superintendence of, the work were carried out by Messrs. George and Isaac Steane, architects, Coventry.

### LEGAL INTELLIGENCE.

**IN RE J. AMSON.**—At the Crewe Bankruptcy Court last week, before Mr. Registrar Speakman, John Amson, builder, of Woolstanwood, attended for his public examination, which was conducted by Mr. Thomas Bullock (official receiver). The gross liabilities were £2,806 7s. 7d., and the deficiency £2,017 2s. 7d. The debtor said he started business three years ago with a capital of £110. During that time he had built about sixty houses. He thought he had made a profit on only eight of them, and that he had lost on the rest. The examination was adjourned.

**ALLEGED BREACH OF COVENANT.—FLETCHER V. NOKES.**—This action, heard by Mr. Justice North in the Chancery Division on Thursday in last week, was brought by a landlord to recover possession of some houses at Stratford, Essex, on the ground of breach of covenant by the tenant. The lease, dated June 7, 1886, contained a covenant by the lessee (the defendant) to keep the premises in good condition and complete tenantable repair, and at the expiration or sooner determination of the term so to yield up the same to the lessor (the plaintiff). The lease contained a proviso for re-entry by the plaintiff on any breach of covenant by the defendant. The plaintiff alleged that the defendant had committed a breach of the above covenant, and in February, 1895, the plaintiff served on the defendant a notice requiring the defendant "to repair the said houses in accordance with the said covenants forthwith." The defendant having failed to comply with this

claimed, with interest from November 21 at 5 per cent., and costs.

**A BUILDING MANAGER AND HIS PRINCIPALS.**—In the Official Referees' Courts, this week, Mr. Ridley, Q.C., has been engaged in hearing the case of Messrs. v. Saunders and others. Plaintiff, Mr. John James Messer, of Fernlea-road, Balham, sues Messrs. Saunders, Hawksford, and Bennett, of 68, Coleman-street, E.C., and Mr. J. G. Hewat (formerly carrying on business as solicitors, under the style of Saunders, Hawksford, Bennett, and Co.) for the recovery of £3,320 13s. 4d., alleged to be due him, and including advances he made to defendants to enable them to finance certain builders. Mr. Hewat pleaded non-liability under partnership deed. The other defendants set up a counter-claim, alleging that plaintiff, as their clerk, received a salary for devoting his whole time and attention to the firm's building estate business, inclusive of the superintendence of the completion of unfinished houses, and repairs to those in occupation, that he gave certificates to builders in excess of the actual work done, that he received secret commissions for supplies of materials, and that he had been in partnership with some of the builders. Upon these grounds, defendants (Saunders, Hawksford, and Bennett) asked for an examination of all plaintiff's accounts of receipts and expenditure. Plaintiff's statement was that in 1874 he was a bill clerk employed by a firm of City solicitors, whose business was in that year acquired by Messrs. Saunders, Hawksford, and Bennett. They took over plaintiff's services with the business. Subsequently Mr. Hewat was admitted a partner. Speculation in land and buildings was largely engaged in by the firm, who either purchased freeholds or obtained long leases of land suitable for building, and entered into agreements with various builders for the erection of houses, using for the purpose either their own money or that of clients—also inviting their clerks to make advances—in order to finance the builders. Plaintiff first advanced them money in this way in 1879. In 1885 defendants dismissed their then surveyor for the estate work, and plaintiff was asked to undertake the management and superintendence of the building estates, he to receive, in addition to the continuation of his yearly salary of £200, a free residence and survey fees. He was to have the letting of the finished houses, the collection of the rents and the execution of repairing jobs required from time to time, the latter to be done as cheaply as possible at such rates as would leave him a slight margin of profit. In 1894, the defendants ascertained that they were losing money, and plaintiff, worried about the large balance due to him, was stricken with brain-fever and incapacitated for business. After his recovery in 1895 he failed to obtain a settlement. The particulars of claim showed balances due, respectively, of £658 6s. 9d. on general account, and £1,746 3s. on repairs account, the remaining items comprising loans to builders and interest on the whole from June 24th, 1894, to the date of action. Mr. Houghton, for Messrs. Saunders, Hawksford, and Bennett, said it was due to plaintiff's representations that the previous surveyor was discharged, and in consequence of the knowledge and experience he had gained in the office in dealing with the building estate business he was relieved of all legal duties, and given the superintendence and management of the estate building work. The firm was always encouraged by plaintiff to go on with these building operations. Upwards of £3,000, counsel said, had passed through plaintiff's hands for these building operations, the bulk of which had been lost. Plaintiff was examined at great length as to his claim, and in cross-examination he was questioned in close detail as to his transactions. He denied that the sums set out in his claims were substantially profit he had made on the firm's money which had passed through his hands. He had received no secret commissions. Several witnesses were examined on both sides. When the case was recommenced yesterday (Thursday) morning, counsel announced that, subject to the learned Referee's sanction, a settlement had been arrived at whereby a certain sum was to be paid to plaintiff in full settlement, and all imputations on his character that might be considered to be raised in the counter-claim were unreservedly withdrawn. The Official Referee observed that this was a satisfactory termination to the case, and entered judgment for plaintiff, with costs, on the terms stated, which did not transpire in open court.

**A NEWGATE-STREET ARBITRATION.**—In the Lord Mayor's Court, before the Recorder (Sir Charles Hall, Q.C., M.P.) and a special jury, the case of "The Trustees of the City of London Parochial Charities v. the Central London Railway Company" was decided last week. It was a compensation case arising out of the construction by the railway company of their railway station in Newgate-street. For the purposes of that station the company had compulsorily acquired the freehold premises known as 20, King Edward-street, the property of the claimants, whose estimate of its value was £9,000 odd, while the value sought to be placed upon it by the railway company

notice, the present action was brought in March, 1896, and it now came on for trial. Plaintiff relied on section 14 (1) of the Conveyancing Act, 1881. Mr. Justice North dismissed the action with costs, on the ground that the above notice of breach was not sufficient within section 14. The notice ought to be so distinct as to direct the attention of the tenant to the particular defects of which the landlord complained, so that he might have an opportunity of remedying them before action was brought. This being so, his Lordship thought that the notice given by the plaintiff was not specific enough. It was merely a notice that "You have broken the covenants," no particulars of any kind being given. The plaintiff had not condescended to give details, and in his Lordship's view the notice was not sufficient under section 14.

**NOVEL DEFENCE TO AN APPORTIONMENT CLAIM.**—At the Hertford Borough Sessions, on Thursday in last week, the Hertford Corporation sued Robert Green for £16, being the apportionment of the expense of making up Tower-street, Bengoe, alleged to be due from him as a frontage owner in that street. It was stated that the defendant was the owner of 240ft. frontage in Tower-street, a private street. The work of making up the street was completed by the Corporation in 1896, and the amount of the expense apportioned to be paid by defendant was £16. Defendant had not given written notice of objection within three months; nor had he appealed to the Local Government Board within 21 days of the notice of demand for payment, but he had not paid the amount of the apportionment. Samuel Percy Andrews, assistant to the borough surveyor, gave evidence as to the services of notices, and Mr. Jevons, borough surveyor, gave evidence as to making the apportionment. Mr. Chalmers-Hunt argued for the defence that his client was not liable for the works which had been carried out. Defendant had metalled, gravelled, and channelled the road himself, and, prior to Bengoe being included in the borough, not a word was heard complaining of the state of the road. But the corporation, having extended their boundary, were bound under the Act of 1875 to sewer the whole of their district. Defendant had put the road in repair, and the corporation put it out of repair in laying their sewer, and then had the audacity to ask the Bench to order the defendant to pay for putting it in order again. The magistrates considered that the corporation had proved their case, and made an order for payment of the £16



was £6,510. The premises were constructed in 1876, and were let by the claimants upon lease for 21 years from the year 1877 at a rental of £263 10s. About 2½ years of the lease was unexpired. The contention put forward by the claimants was that the property had greatly increased in value since the execution of the lease, and that, instead of being worth only £263 10s. per annum, the premises were now worth £350 a year. That sum they sought to have capitalised on the 4 per cent. table, which allowed for 25 years' purchase, and which, with the usual 10 per cent. added for compulsory purchase, made up the total amount of their claim. The witnesses called for the claimants were Mr. S. Green, Mr. F. W. Porter, Sir Whittaker Ellis, and Mr. H. Winstanley, who all gave it as their opinion that the claimants' estimate was a fair one. For the railway company it was contended that a fair rental was £300 a year, which ought to be capitalised on the 5 per cent. table, which allowed for 20 years' purchase. A number of witnesses were called, and in the result the jury awarded the claimants £7,975.

**COMPENSATION AWARD AT MANCHESTER.**—Mr. H. Oakley, F.S.I., the umpire in the case of the trustees of Ansell Spier v. the Corporation of Manchester, has published his award. The corporation required certain freehold property in Manchester for a public improvement, and obtained Parliamentary powers for its compulsory purchase. The question of value was referred to arbitration, Sir J. Whittaker Ellis, F.S.I., and Mr. W. Radford, F.S.I., being the arbitrators respectively for the claimants and the corporation. The claim was £27,500, and the corporation offer was nominal. The expert witnesses for the claimants were Messrs. J. Cross, F.S.I. (Cross and Eagle, Manchester), Colonel Bridgford, C.B., F.S.I. (Bridgford and Sons, Manchester), W. Frank Perkins, F.S.I. (Perkins and Sons, Southampton), and W. Wilson, F.S.I. (Wilson and Sons, Manchester), and for the corporation, Messrs. W. Bennett, G. H. Garmuth, F.S.I., and F. H. Oldham. The umpire awards the claimants £25,850.

#### CHIPS.

The Duke of Beaufort has recently reroofed, reseated, and generally restored the church at Stoke Gifford, Bristol, under the superintendence of his architect, Mr. E. H. Lingen Barker, of London and Hereford; Mr. C. A. Hayes, of Bristol, being the contractor selected.

Mr. White Cooper, of Bedlington, has been appointed surveyor to the Slough Urban District Council.

The Pennsylvania State Capitol building at Harrisburg was burned down on Tuesday. The loss is estimated at £200,000 sterling, of which only £10,000 is covered by insurance. Valuable records were destroyed which cannot be replaced.

Since November 1st of last year the parish church of All Saints', East Tuddenham, Norfolk, has been undergoing interior restoration, Mr. J. H. Green, of Norwich, being the architect. A new floor (with the exception of the centre passage in the nave) has been put down throughout, on a bed of concrete. The chancel and nave have been reseated, the pulpit and prayer-desk altered and moved, and the reredos enlarged. The reopening of the church took place on Wednesday week.

A deputation, comprising the Mayor of Cardiff and other gentlemen, waited upon Sir W. Thomas Lewis on Friday with reference to a proposal on behalf of the Cardiff Corporation to acquire from Lord Bute Cathays Park (the site of the recent exhibition) for public purposes. It transpired that Lord Bute is willing to dispose of the park, and Sir William undertook to go to Scotland, and have an interview with his lordship respecting certain details mentioned by the deputation.

The very curious tower of the church of St. Bartholomew, Moor-lane, near Moorgate-street, has been declared unsafe. The tower is one of the fanciful works of Sir Christopher Wren, who, instead of battlements or pinnacles, placed upon the centre of each of the four sides a miniature Roman triumphal arch. The church was originally founded in 1438, near the site of the Royal Exchange, but was practically destroyed in the Great Fire of 1666, and was rebuilt by Wren; a generation since, when the site was cleared, the tower was taken down and re-erected under the direction of Professor Cockerell in Moor-lane, as an adjunct to a hideous brick church. The interior of the edifice, though plain almost to ugliness, possesses a carved-oak pulpit and altar-screen. The Commissioners of Sewers demand either the removal or the thorough reconstruction of the tower and other stonework.

An influential committee has been formed to promote a scheme for filling with statues the many vacant niches in the west front and towers of Beverley Minster, as at Lichfield and Salisbury Cathedrals. At a conference in the Guildhall, Beverley, the Bishop of Beverley presiding, the vicar stated that 12 large figures had already been promised.

#### WATER SUPPLY AND SANITARY MATTERS.

**THE LONDON WATER SUPPLY.**—A conference on the London water question, convened by the London Reform Union, was held in the hall of Clifford's Inn, Fleet-street, on Thursday in last week. Mr. J. Passmore Edwards occupied the chair. Mr. W. H. Dickinson, chairman of the Water Committee of the London County Council, said it was of the greatest possible importance that some settlement of the question should take place at the earliest possible moment, and it was in view of that fact that the Council last July resolved once again to bring in its Bills. The Government, he thought, would be making a great mistake if they used the weight of their national majority to prevent the London County Council from coming into their heritage of the water supply of London. He trusted that they would say that this was a question which ought to be left to a committee of the House to be argued out fairly, and he was certain that if that were done the Council would be able to show that they had a good case. As regards the future, he advocated the adoption of the Welsh supply in preference to one obtained from the Thames and stored in reservoirs. To supply the additional 200 million gallons of water which would be required in 1931 by means of storage would, he said, involve a capital expenditure equal to 20 millions sterling, whereas a capital expenditure of only 19 millions would be required for the same quantity of water if it were obtained from Wales. Mr. D. White moved:—"That this meeting is of opinion that the settlement of the question of the London water supply should be pressed forward without delay, and that the policy of the Bills promoted by the London County Council for the purchase by that body, as representing the London consumers, of the undertakings of the eight Metropolitan water companies is one that should command the assent of Parliament." The motion was seconded by Mr. Idris, supported by Mr. Martin Wood, Mr. Knowles, and others, and unanimously agreed to.

**AMBLE.**—The Amble Water Works are now completed to the satisfaction of Mr. M. Temple Wilson, the engineer, and are now opened out. The work has been carried out by Messrs. R. Carse and Son, Amble, the quantities being prepared by Mr. George Bell, building and quantity surveyor, 13, Westgate-road, Newcastle-on-Tyne.

**HAWARDEN.**—At the last meeting of the Hawarden District Council, it was decided to engage Messrs. Beloe and Priest, civil engineers, of Liverpool, to report on the sanitary condition of the district, which includes not only the village of Hawarden, but several of the neighbouring townships, such as Ewloe, Pentre, Sandy croft, Shotton, Aston, Mancot, and part of Saltney.

#### PARLIAMENTARY NOTES.

**COMPLETION OF SOUTH KENSINGTON MUSEUM.**—Mr. Massey-Mainwaring asked the Secretary to the Treasury, on Monday, if this year the funds would be provided necessary to complete the frontage of the South Kensington Museum; and, if so, would it be a condition that the extra space should be available for the exhibition of objects of art, and not for any increase to the present number of offices? He also asked if the necessary funds would be provided so that the National Gallery, the National Portrait Gallery, and the Natural History Museum might be lighted with an electric installation. Mr. Hanbury: If my hon. friend will look at Class 1 of the Estimates, he will see that it is not proposed to ask Parliament to provide funds for these purposes in the present year.

Mr. Silvanus Trevail, Truro, has been appointed architect of the new county asylum buildings at Bodmin, which are to be erected at a cost of about £40,000.

The members of the Bradford Town Council are once more to have the question of erecting an art gallery and municipal buildings seriously discuss, and this time the motion will come forward as the suggested way of celebrating the Queen's Diamond Jubilee. The sub-committee appointed to consider this subject met on Monday, and they decided to recommend the council to invite plans for municipal offices and an art gallery.

The Public Health (Scotland) Bill, which is before the House of Commons, and which is backed by the Lord Advocate, Mr. Balfour, and Mr. Anstruther, has been printed. The Bill proposes to repeal the Public Health (Scotland) Acts of 1867, 1871, 1875, 1882, and 1890. It does not propose to repeal the Public Health (Scotland) Act of 1891, or to include its provisions, which are mainly of local interest, in the consolidation. Further, it leaves untouched the sanitary provisions of the Burgh Police (Scotland) Act, 1892. Dr. Farquharson intends to move, after the Second Reading of the Bill, that it shall be referred to a Standing Committee, on which all the Scotch members shall sit.

#### Our Office Table.

WITH reference to the approaching Jubilee of the London Architectural Association, the President, Mr. Beresford Pite, writes in the *A.A. Notes* for February:—The special committee and a sub-committee have met several times already, and are maturing plans for the celebration, and the more important work of perpetuating the effort by affording some permanent benefits to the Association. The issue of an extra number of *Architectural Association Notes*, to be solely occupied with reviews of the past fifty years and indications of further progress and development, has been decided upon. The celebration will take place so soon after Easter as possible, and will include a public banquet, a general conference upon the work of the Association, and our annual *soirée*.

THE London County Council, at their meeting on Tuesday, adopted the recommendation of the General Purposes Committee, and appointed as manager of the Works Department Mr. W. Adams at a salary of £1,500 a year, on the understanding that the appointment is not necessarily permanent, and that the remuneration is subject to revision if the Council decides to limit the extent and character of the operations of the Works Department. The former manager, Mr. T. Holloway, had £750 a year. There were 237 applications for the post, which were reduced to three by the committee, the other two being Mr. H. H. Holt and Mr. J. J. Warbrick. On the recommendation of the Improvements Committee it was agreed that the Council should contribute £3,500, half the cost of widening Elthorne-road, Holloway-road, and £3,800 towards widening Church-way, Euston-road. It was also agreed to contribute £8,000, half the cost of purchasing five acres of land at the Cattle Market, Islington, for an open space, on condition that the Islington Vestry should pay all the costs of the acquisition, and should lay out and maintain the ground as a place of public recreation. The Parliamentary Committee recommended for acceptance agreements with the Surrey County Council and the Croydon Corporation in regard to the water question. An amendment referring the matter back until the Council could have a report on the negotiations with other county and municipal authorities was, on a division, carried by 53 to 51 votes. The recommendation of the Housing of the Working Classes Committee, that their superintending architect, Mr. T. Blashill, be instructed to prepare plans of dwellings for the accommodation of about 1,200 persons on a portion of the Millbank Prison site, and also that an advertisement be issued inviting architects to send in their names as willing to submit designs for the erection of buildings on the remaining portion of the area, was agreed to.

Some particulars concerning the management of Epping Forest appear in the annual report of the Epping Forest Committee of the Corporation. The moderate thinning of the overcrowded woodlands has been continued, the work consisting of the removal of inferior stems which injure those of more picturesque growth, or which interfere with the healthy development of the undergrowth and saplings. In future, the preservation of the natural beauties and features of the forest will be maintained by the non-removal of trees overthrown by the wind and those of a larger growth which die. The shooting of wild birds has been stopped, and the number of wild ducks breeding at Wanstead has greatly increased. In the early part of last year it was resolved to take a census of the deer, and the operation proved one of considerable difficulty, but out of four censuses three were practically identical, and these indicate that the fallow deer number about 130 and the roe deer about 13, a large increase.

It has been decided to hold a conference in London shortly to consider the question of the housing of the working classes, and the committee appointed to make the necessary arrangements, being anxious to collect information, more especially from the rural districts, have sent circular to the chairmen of the various parish councils, inviting them to lay the matter before their respective councils, in the hope that the council, or one of its members, may be willing to supply particulars as to the condition of the cottages in their parishes. The committee wish to be informed more especially on the general conditions and sanitary state of the dwellings, the



At the recent annual meeting of the Board of Trade and Transportation in New York, the report of the special committee on the subject of the limitation of the height of buildings recommended that a law be drafted and presented to the Legislature providing that, on the wide streets and avenues of that city, no building hereafter erected shall exceed 200ft. in height, and that no building used as an hotel or apartment house shall exceed 165ft. These measurements shall be from

Mr. Bartholomew Smith, of Thirsk, the oldest tradesman in the town, and one of the most popular landscape artists in Yorkshire, died, in his 84th year, at Weston-super-Mare, on Thursday night. Until recently Mr. Smith was the head of a firm of grocers and drapers in the Market-place, Thirsk. As an artist he was widely known, and his pictures of "The Harvest Field," "The Horse Fair at Thirsk," "The Old Toll Booth," "Rievaulx Abbey," and "Swigging Timber" are amongst his best productions, and they all made big prices. It was nothing unusual for Mr. Smith to earn from £500 to £600 per year with his pencil.

insaped .....	per ton	£15	7	6	to	£16	0	0
rapeseed, English pale...	"	"	"	"	"	"	"	"
o., brown .....	"	"	"	"	"	"	"	"
ottonseed ref. ....	"	"	"	"	"	"	"	"
olive, Spanish .....	"	"	"	"	"	"	"	"
real, pale .....	"	"	"	"	"	"	"	"
oceanut, Cochín .....	"	"	"	"	"	"	"	"
o., Ceylon .....	"	"	"	"	"	"	"	"
alm, Lagos .....	"	"	"	"	"	"	"	"
leine .....	"	"	"	"	"	"	"	"
lubricating U.S. ....	per gal.	0	6	3	"	0	7	6
o., black .....	"	"	"	"	"	"	"	"
ar, Stockholm .....	per barrel	1	0	0	"	—	—	—
renchal .....	"	0	12	6	"	—	—	—
urpentine, American ...	per ton	22	7	6	"	22	12	6



## LIST OF COMPETITIONS OPEN.

Folkestone—Fifty Working-Class Houses, East Cliff	£10	W. G. S. Harrison, Town Clerk, 4, Cheriton-place, Folkestone	Feb. 13
Dudley—Grammar School and Master's House	£50, £30	Albert Morton, Clerk to Governors, 15, Birmingham-road, Dudley	" 15
Felixstowe—Laying-out Cliffs and Erecting Buildings	£50, £15	Jennings and Haward, Felixstowe	Mar. 1
Enniskillen—Town Hall (£7,500 limit)	£50, £20, £10	Thomas Elliott, Borough Surveyor, Enniskillen	" 20
Christiana—Railway Terminal Station Plans	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s.	Railway Offices, 6, Victoria-terrace, Christiania	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Washington Browne, A.R.S.A., Edinburgh, Assessor)	£100 (merged in 4 per cent.), £50, £25	A. Macdonald, Town Clerk, Hillock House, Govan	" 31
Guernsey—States Assembly Hall (£15,000 limit)	£100, £50	N. Domaille, Supervisor of Harbour, States Offices, Guernsey	April 17
Elne, France—Water Supply Scheme (3,300 inhabitants)		La Marie, Elne, Pyrenées Orientales	July 1
London—Electric Omnibus and Cab Designs	£150, in three premiums	Sec., London Electric Omnibus Co., 6, Northumberland-av., W.C.	—
Bolton—Fire Station (£12,000 limit, local architects only)	£50, £20	R. Gudgeon Hinnell, Town Clerk, Bolton	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Coniston—Shop and House	Sawrey Co-operative Society	J. Leake, Sawrey, Windermere	Feb. 6
Mountain Ash—Additions to St. Margaret's Church	Rev. B. Lloyd	E. M. Bruce Vaughan, A.R.I.B.A., 20, St. Mary-street, Cardiff	" 6
Halifax—Constitutional Club, Lee Mount	School Board	J. F. Walsh, Architect, Bank Chambers, Halifax	" 8
Moulton—Cookery School	Rev. E. L. Ellis	Joseph Cawley, M.S.A., Northwich	" 8
Llantrithyd, Glam.—Restoration of Church	Rev. L. Lloyd Davies	G. E. Halliday, Architect, 14, High-street, Cardiff	" 8
Carnetown, Abercynon—Chapel (500 seats)	School Board	G. E. Halliday, Architect, 14, High-street, Cardiff	" 8
Bromley, Kent—Additions to Raglan-road Schools	St. Giles's Board of Works	Geo. Wall, Clerk, Haxstead-road, Bromley	" 8
High Holborn—Underground Urinal	Corporation	H. C. Jones, Clerk, 197, High Holborn, W.C.	" 8
Kingston-on-Thames—Additions to Clattern House	Corporation	H. A. Winsor, Town Clerk, Clattern House, Kingston-on-Thames	" 8
Derby—Skin Market	Industrial Co-operative Society	R. J. Harrison, Borough Engineer, Babington-lane, Derby	" 8
Morley—Co-operative Premises	T. L. Llewellyn	G. B. Clegg, Architect, 8, Peel-street, Morley	" 8
New Tredegar—Three Villas	Industrial Co-operative Society	H. Sketch, Architect, New Tredegar, Mon.	" 8
Middlestown—Warehouse and Manager's House	Committee	A. Palmer, Manager, Middletown, Yorks	" 8
Hull—Renovation of Primitive Methodist Chapel, Hesse-row	Croydon Rural District Council	Rev. C. Le fe, 22, Lister-street, Hull	" 8
Beddington Corner, Carshalton—Isolation Hospital	Great Western Railway Co.	Jas. Wilson, Clerk, 49, London-road, Croydon	" 9
Tiverton—New Station at Junction	H.M. Commissioners of Works	G. K. Mills, Secretary, Paddington Station, W.	" 9
Ely—Post Office	Great Western Railway Co.	Hon. Reginald B. Brett, Secretary, 12, Whitehall-place, S.W.	" 9
Tiverton Junction—Station Buildings	Royal Insurance Company	G. K. Mills, Secretary, Paddington Station, W.	" 9
Wombwell—Four Houses, Main-street	Corporation	Jno. Robinson, Wombwell, Yorks	" 9
Liverpool—Pulling Down Buildings, North John-street	School Board	J. F. Doyle, 4, Harrington-street, Liverpool	" 9
Leeds—Shaft for Lift, Municipal Buildings	School Board	Town Clerk, Town Hall, Leeds	" 10
Tintagel, Cornwall—King Arthur's Castle Hotel	School Board	S. Trevel, F.R.I.B.A., Truro	" 10
Kingston-on-Thames—Art and Technical schools	Co-operative Society	H. A. Winsor, Town Clerk, Kingston-on-Thames	" 10
Glyncorwyg—School Alterations	School Board	Lambert and Rees, Architects, Bridgend	" 10
Glyncorwyg—Alterations to School	School Board	Cuthbertson and Powell, Clerks, Bridgend, Glam	" 10
Otley—Thirty-two Houses in Leeds-road	Co-operative Society	Fairbank and Wall, Architects, 3, Manor-square, Otley	" 10
Durham—12 Workmen's Houses, Mitchell-street	School Board	The Secretary, Claypath, Durham	" 11
Aberdare—Additions to Aberaman Schools	Northumberland County Council	John Morris, Clerk, Town Hall, Aberdare	" 11
Morpeth—Laundry at Asylum	School Board	John Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne	" 12
Llandysul—Intermediate Schools	Trustees	J. H. Phillips, Architect, St. John's Chambers, Cardiff	" 12
Swanwick—House	County Police Committee	R. Argile, Architect, Swanwick	" 12
Southwark—Extension of Borough Market	A. C. Jupp	Jarvis and Sons, 29, Trinity-square, Southwark	" 12
Shipley, Yorks—Wool Combing Works	School Board	Walker and Collinson, Architects, 227, Swan Arcade, Bradford	" 13
Barrowford, Nelson—Police Station	School Board	H. Littler, Architect, 21, Pitt-street, Preston	" 13
Gorleston—Two Houses on the Cliff	School Board	W. B. Cockrill, Architect, Gorleston, Yarmouth	" 13
Fowey—Boys' School	School Board	W. J. Graham, Clerk, Fore-street, Fowey	" 13
Shipley—Wool Combing Works	Coventry Corporation	Walker and Collinson, Architects, 227, Swan Arcade, Bradford	" 13
Sheffield—Additions Springside School	Committee	C. J. Innocent, Architect, 17, George-street, Sheffield	" 13
Pinley—Small-pox Hospital	H. Roberts, Penzance	G. and I. Steane, Architects, Little Park-street, Coventry	" 13
Cesarea—Three Houses	Asylums Corporation	C. J. Roberts, Bedford, Upper Llandwrog	" 13
Gulval, Cornwall—Villa	Aberstruth School Board	Oliver Caldwell, F.R.I.B.A., Penzance	" 14
Ramelton—Schoolhouse	Aberstruth School Board	Rev. Thomas Steven, P.P., Ramelton	" 15
Selside, Kendal—Schools	Committee	John Hutton, M.S.A., Kendal	" 15
Steeple Gidding—Farmhouse	Blackey Moor Co-operative Society	Noel Villiers, 15, Great George-street, Westminster	" 15
Aberdeen—Additions to Branch Lunatic Asylum	School Board	G. Taylor, Clerk of Works, Aberdeen Asylum	" 15
Cwmillery—School (200 places)	Board of Guardians	J. A. Jones, Clerk, Blauna, Mon.	" 15
Nantyglo—Additions to School	Horse Show Society	J. A. Jones, Clerk, Blauna, Mon.	" 15
Halifax—Liberal Club, Lee Mount	Urban District Council	Medley Hall, Architect, 29, Northgate, Halifax	" 15
Blackburn—Shop in Simons-street	Urban District Council	Simpson and Duckworth, Architects, Blackburn	" 15
Orpington—Additions, Chislehurst-road Schools	Joint Hospital Committee	G. Wall, Clerk, Haxstead-road, Bromley	" 16
Ashton-under-Lyme—Workhouse Extension	Gaslight Co.	B. Seymour, Clerk, Stamford-street, Ashton	" 16
Exeter—Exhibition Yard	Committee	A. W. Buckingham, Hon. Sec., 12, Southernhay, Exeter	" 16
Brentford—Fire Station, High-street	Co-operative Society	Stephen Woodbridge, Clerk, Brentford	" 16
Brentford—Mortuary, Town Meadow	Board of Guardians	Rev. T. Gwilym Evans, Aberystwy, Wales	" 17
Aberayron—Enlargement of Congregational Chapel	Joint Hospital Committee	W. Jenkins, Clerk, Falmouth	" 17
Falmouth—Boys' School, Wellington-terrace	French Government	Swash and Bain, Architects, 3, Friars Chambers, Newport, Mon.	" 17
Aberthillery—Intermediate Schools	London County Council	Jas. Gornall, Acting Clerk, Rainhill Asylum	" 19
Rainhill—Additions to Wards, County Asylum	Committee	Robt. Walker, J.P., P.S.A., 17, South Mall, Cork	" 19
Cork—Alterations, Wesley Chapel, Patrick-street	Committee	Thos. Bakewell, Secretary, Cocker-mouth	" 20
Cockermouth—Lodge and Museum, FitzPark	Committee	The Mairie, Cannes, Alpes Maritimes	" 20
Cannes—Post and Telegraph Office	Committee	R. W. Partridge, Clerk, 21, Whitehall-place, S.W.	" 22
Horton, Surrey—Foundations of County Lunatic Asylum	Committee	Edmund Sedding, Architect, Plymouth	" 22
Falmouth—Church Restoration	Co-operative Society	Holtom and Fox, Architects, Westgate, Dewsbury	" 22
Dewsbury—Covered Way at Warehouses	Board of Guardians	T. P. Orford, Clerk, Workhouse, Athy	" 24
Athy, Ireland—Dispensary House at Castledermot	Joint Hospital Committee	W. J. Ancell, Architect, 3, Staple Inn, Holborn	" 26
Mogden, Middlesex—Fever Hospital	Gaslight Co.	Wm. Barker, Architect, 25, Orchard-street, Londonderry	" 27
Faughan—Renovation, Presbyterian Church	Committee	Hanbury Thomas, Secretary, Commercial-street, Sheffield	" 27
Sheffield—Retort House, Coal Stores, &c.	Committee	T. L. Evans, Hon. Sec., 3, Commercial-street, Newport, Mon.	Mar. 1
Newport, Mon.—Eisteddfod Pavilion in Cattle Market	Committee	Rev. D. E. Holland, Culmington Rectory, Salop	" 1
Culmington—Church Tower Restoration	Committee	J. Lamb Murray, 1A, Heavside, Biggar	" 1
Hartwood Asylum—Cottages for Attendants	Committee	J. Grindy and Sons, Architects, 12, Brazenose-street, Manchester	" 1
Whitefield, Lancs—Detached House, Church-lane	Committee	John Holt, C.E., 6, St. Mary's Gate, Manchester	" 1
Pendleton—Construction of Bowling Green	Committee	Robert Tait, Erskine-place, Pumpherton, N.B.	" 1
East Calder, N.B.—Cottage and Stable	Committee	Wm. Holdridge, 5, Upper Accommodation-road, Leeds	" 1
Leeds—Eight Houses, Richmond Hill	Committee	J. C. Spivey, Architect, Old Park-road, Roundhay, Leeds	" 1
Leeds—House in Roundhay-road	Committee	H. H. & E. Cronk, Architects, 4, Mount Ephraim-rd., Tunbridge Wells	" 1
Tunbridge Wells—Houses in Vale Royal	Committee	E. Fearnly Bishopp, Architect, Ipswich	" 1
Thorndon, Suffolk—School at Kerrison Reformatory	Committee	A. N. Bromley, Architect, Queen-street, Nottingham	" 1
Nottingham—Re-erection, Dunkirk School	Committee	E. Bremner Smith, Architect, Oswestry	" 1
Glyn Ceirog—Hotel	Committee	R. Hornsby and Sons, Limited, Grantham	" 1
Grantham—Brick Chimney (180ft. high)	Committee	Arthur J. Lacey, Architect, 6, Upper King-street, Norwich	" 1
Yarmouth—Additions, Queen's Hotel	Committee	Fred Holland, Architect, 338, Wakefield-road, Bradford	" 1
Bradford—Weaving Shed and Warehouse	Committee	Eaton, Sons, and Cantrell, architects, Ashton-under-Lyme	" 1
Ashton-under-Lyme—George and Dragon Hotel	Committee	Hy. Harper, Architect, Market-place, Nottingham	" 1
Syston—Primitive Methodist Sunday Schools	Committee	J. G. Stallebrass, Architect, North-street, Peterborough	" 1
Peterborough—Steam Laundry	Committee	J. R. Brown and Son, Architects, Luton	" 1
Luton—Stand, Dressing Rooms, and Football Ground	Committee	Isitt, Adlin, and Hill, Architects, Bradford	" 1
Ilkley—Billiard Room and Stabling	Committee	W. J. Abel, Clerk, Victoria-street, Nottingham	" 1
Nottingham—Enlargement of Quarry-road School	Committee	Evans and Son, Architects, Wheelgate, Nottingham	" 1
Nottingham—Corridors at People's College	Committee	The Presbytery, St. Finbarr's West, Cork	" 1
Upper Glasheen, Cork—National Schools	Committee	J. T. Waitworth, 3, Albert Roys-street, Rochdale	" 1
Rochdale—Five Villas, Wardleworth Brow	Committee	W. S. Braithwaite, Architect, Leeds	" 1
Leeds—Enlargement of Clingate-road Schools	Committee	W. S. Braithwaite, Architect, Leeds	" 1
Leeds—Schools in Norwood-grove	Committee	Wm. Dixon, Architect, St. John-street, Newcastle-on-Tyne	" 1
Hexham—Linnel Mill	Committee	R. C. Clarke, Architect, Prudential Buildings, Nottingham	" 1
Church Gresley—Schools	Committee	F. R. Kempson, F.R.I.B.A., 134, Widemars-street, Hereford	" 1
Bromyard—Headmaster's House	Committee	H. Higginson, M.S.A., 3, Lonsdale-street, Carlisle	" 1
Carlisle—Railway Tavern and Warehouse	Committee	Jas. Rowell, Architect, Boston	" 1
Boston, Lincs—Three Houses at Witham Bank East	Committee	J. F. Fuller, Architect, Brunswick Chambers, Dublin	" 1
Ballaslaw—Glebe House	Committee	J. H. Boston, 2, Guide-lane, Hooley Hall	" 1
Ashton-under-Lyme—Liberal Club	Committee	W. J. Taylor, Architect, 33, Bank-street, Sheffield	" 1
Sheffield—Seven Houses, White Horse-road	Committee		" 1



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### COMMONPLACE AND IMITATION.

THE world of art, like other things, is mainly governed by commonplace and imitation, because, chiefly, there is no one to take the lead. The old Greek "tyrant" or despot fostered men of genius as architects, sculptors, and artists generally. The Mediaeval absolute monarchy in like manner encouraged church building; but at the present day we have a vast-divided power, political and otherwise, which cares nothing for art, and leaves all there is to be done to be scrambled for. Competition seems to be the motive power now—but competition, not for artistic creation or power, but for cheapness. Architects have now to appeal, not to nobles or archons or great ecclesiastical chapters, but to the people, who know nothing about their art in any other sense than that it is a sort of "fine" building that costs money. The question with the popular arbiter is not whether this design is good or bad as a work of architecture, but whether it complies with the popular demand and is not too costly. It is no longer a question to be decided by an emperor or an areopagus or ecclesiastical authority, but by men and committees who have no pretence of being judges. There was some security when a Greek athlete, a demi-god, or hero inspired the artist in his work, when a Myron produced a "Discobolus," or a Pheidias recorded in marble a victory over the Persians; but very little to inspire the architect when he has to build a set of municipal offices under the control of men who have no heart above the rates. These are the sorts of conditions which favour views of art that cannot rise above the ordinary level. A man with ideas above his fellows has little hope; his emulation sinks within him when he sees Mr. Truckle's design chosen in competition, and members of his own profession obtaining places at the council board of Institutes or made Royal Academicians, who have little claim to the distinction. But the British public pay for things they do not get, so they are satisfied with an inferior article for their money, and as they are not very appreciative of good architecture when they see it, the second best does pretty well. Accordingly we find a great deal of very commonplace building and very ordinary workmanship pass muster. The architect probably is not altogether to blame; he would like something better, but cannot carry out his views. A low tender or very inadequate provisional sums have so far restricted him. "Cutting down" the estimates is one of the modern ways of doing business, and the architect has to fall in with it. Fifty years of commercial and industrial progress has not materially helped us. Our buildings are still without those accessorial features like sculpture or painting, or even like good decoration, which made the Greek and Italian Renaissance periods so conspicuous. The art of the "sculptor-architect," as Mr. Alfred Gilbert, R.A., called him in his remarks at the Institute, is absent in our modern architecture. The tee and set square seem to rule supreme, the methods of modern building are not questioned, the old habits are still strong. We say this in no disparagement of these methods, for we may do infinitely worse; but the modern architect is content to adopt plans and forms that show little deviation. Mr. Gilbert contrasted the sculptor-architect and the architect-sculptor—we do not think he was quite correct in his comparison. The latter, during the

era of the Renaissance, was, we are told, content to imitate or adopt Classic models (not entirely, we think)—they were hard at work as students of antiquity; while the former, the sculptors, were yearning to create—they longed for liberty and a larger field for invention, and they ultimately succeeded in creating forms they originally were called upon to decorate. The sculptor-architect recognised no specialities; his endeavour was to excel. He saw possibilities. The drift of this argument was not so clearly put by Mr. Gilbert as it might have been. All art was one—there was really no line of separation between architecture and sculpture, for both had the same aim, and were one up to a certain point—namely, when one became mere building and the other only ornament. This was the main difference between the sculptor-architect and his fellow-craftsmen who adopted a more restricted sphere of work, and there is the same difference now between architects who create "poets in structure"—who can assimilate the accessories of architecture—and those who are contented to follow what others have done in a plain, matter-of-fact way, merely as a living. As a matter of fact, the architect of to-day is fettered by a great many traditional rules and ideas, by plan, by orders and styles, and numberless other facts of a technical kind. He cannot break away from them. Whether we take Brunelleschi or Michel Angelo, or even Bramante, as the greatest architect of the Renaissance, it is evident each had a conception of architecture that was distinctly sculptural, that placed it in another category to that of the work of our modern men of the same school.

As we look round at our modern buildings, on our plans and designs for public and commercial edifices, we find much that is practical and useful in them—good sanitary arrangements, good planning, structural merit, excellent fittings—but very little, except a certain amount of superficial decoration, to raise them above ordinary building. Regulations are followed, and the architect appears to think that if he designs a presentable building that will compare with others, it is as much as he is expected to do. Its technical qualities may be above reproach, but its "aesthetic" or "phonetic" qualities, to use Ferguson's phrase, are a long way behind. When we consider the conditions of the age, what the architect is expected to be and to do, how many masters he has to please, we are not surprised that the ideal of our architecture is what it is. In their designs artists like Sansovino or Michel Angelo had none of these vexatious conditions; they worked upon a decorative basis. The sculptor saw only the decorative side of architecture, but it was still architecture in one sense. His columns or pilasters, like those in the Medici Chapel, Florence, did not support actual weight, but they were expressive, and suggested architecture in a real sense. The sculptor's idea of building was to model and group its parts just as if he was working in his own plastic art, to endow it with decorative meaning and beauty; but all this is an "unknown quantity" to the practical architect of to-day. He is governed by facts and rules only. He can only see one side of his art, and that is the practical, and to talk to him of the poet-architects of the Renaissance, or even to ask him to appreciate works like the Farnese Palace, or the staircase of San Lorenzo, or even of men of our own time, like Cockerell or Alfred Stevens, would be to invite him to change his skin. Of course we have men of the sculptor's ideal, even in these degenerate days. Cockerell, Soane, Barry, were men who imbibed something of the spirit of the artists of the Italian Renaissance in our own times. Cockerell, as we have lately been told, had so completely mastered Greek architecture

that he could infuse the true spirit of Hellenic art into his work. Soane, too, was a creator of form. His sculptural feeling for mass, light, and shadow is seen even in the Bank, and Barry had much of the true spirit. But how many more are there who cannot quit the groove of prototypes, who can only apply Classical or Gothic façades to given plans, and who cannot model masses? All we can do is to bring to their minds the aims of those who have moved in a higher plane. The men of practical commonplace ideals can ally themselves with their brother craftsmen of the chisel and brush. If the two sides of architecture cannot be again united and brought into harmony—and it almost seems impossible in these days, when all repose has disappeared from our life—it is still within the architect's power to work hand in hand with the sculptor and decorative artist.

Then we have a large class of men who are chiefly imitators of old and modern work. We do not speak ill of all imitation, for some of it is good—better than new-fangled work, though it is not art in a true sense. It has been said that the human race is made up of two classes, "those who borrow and those who lend." Imitation has always been practised more or less by artists of all kinds; but it is generally a mark of weakness rather than of strength. Even among the leaders of architecture copyism is resorted to. Had we the materials to our hands, it would not be difficult to trace the "parentage" of a great many of our buildings which take the credit of being original. If we pursued our search long enough, we might easily detect the inspiration of a large proportion of our public and private buildings. A piece from here, a piece from there, a door or window from another, might easily be found to have given the designer the motive of his latest elevation. Here we come across a patch-work so evident that no one in the profession can mistake the authorship of certain features; the author, or rather compiler, has not disguised his transcripts, and has placed them together with so little art that no one can doubt the combination. They neither run together nor harmonise. Perhaps it is a gable, a replica of one we have recently noted by Mr. Norman Shaw or Messrs. George and Peto, or a bay treatment that forcibly resembles one we have seen before. We cannot mistake the authorship of a detail—it is so characteristic of So-and-So's work. But the "cribber" generally belies his effort by putting together pieces by men of opposite sympathies and views, and then retorts upon himself. It is so hard in these days to catch the spirit of the old work we admire. An eminent Gothicist, who has done much to retrieve his favourite style from the bane of copyism and Philistinism, has himself told us that he has studied Gothic not so much for the ideas it expresses as in the method of expressing them, and his work really is more Jacobean in parts than Gothic. When will architects learn the lesson that under all good architecture—Greek and Gothic and Renaissance—lies the basis of common principles and methods truly catholic in their universal meaning, and founded upon Nature herself? And to discover and practise these principles and methods should be the one ambition of every disciple of the art. Do not the spirit and method of Gothic permeate and pervade the great works of our English Renaissance, and is it not true that this same style appears in buildings like Kirby, Audley End, and Knole quite as much as it does in the chapels of Henry VII. at Westminster, St. George, Windsor, or King's College, Cambridge? The same method of expressing plan and elevation can be found in these old mansions as existed during the reign of the Tudors. The detail may have changed in character, but all that give meaning and life to the Gothic system con-



tinued. In this way the modern architect might road into other styles the same pervading principles, instead of continuing to grope about and stumble over literal and lifeless details of archaeological study.

#### BUILDING TRADE COMPETITION.

AT an important meeting of builders held the other day at Blackburn, called by the National Association of Master Builders, the President, Mr. Thos. F. Rider, deplored the "ruinous competition which seemed to prevail in all trades throughout the country," a "competition which was cutting each other's throats." Those who are at all acquainted with the position of the building trade, however optimistic they may be, will readily admit the truth of the complaint that competition is keener than ever. To a large degree this is attributable mainly to the present condition of contracting and the growing prevalence of the "overlapping" of the trades. The contract system encourages the accession of men to the building ranks who have no rightful claim to the title of workmen—raw youths who have only "picked up" the trade, learners, adult labourers, and journeymen from the country. At present there is no check to this influx of unskilled hands. In the same degree the contract system has discouraged apprenticeship, of which we shall say something presently. The special inquiry made by the Technical Education Board a year or two ago, established important facts in connection with this subject, and showed how few of the large building firms have apprentices. Out of a total of 12,000 men of all ranks, only 80 apprentices were found in London. Nor is it hard to account for this paucity. Building firms have to utilise all the productive power they can; they cannot wait till youths are skilful enough to be entrusted with actual work; on the contrary, the learner is more likely to make himself useful; he is liable to dismissal for misconduct; no agreement is necessary, as in the case of the apprentice. The low contract is also answerable for bringing in a great many who have only been engaged as bricklayers' labourers, and who obtain employment and advance sometimes to the rank of journeymen, and it is the same with masons, carpenters and joiners, plasterers, &c. These new recruits are now commonly taken in many contract works, much to the injury of competent workmen who have learned their trades. The same system, by encouraging cheap labour, has promoted "overlapping" in several trades. Thus the bricklayer undertakes not only his own trade, but plastering and tiling—both inside and roof tiling; the plumber undertakes the painters' and glaziers' business, also gas-fitting and zinc laying; and smiths give prices for sanitary and hot-water fittings, and even plumbing. All these are unhealthy signs in the trade, which appear to be increasing rather than otherwise. We hear of a general relaxation of the limits which at one time prevailed, and the most skilled hands find they are being ousted by men who have never learned the rudiments of their trade.

We should distinguish between the real causes which have brought about these evils. We must not confound honest and fair contracting with the mischief, but rather the competition among builders to outbid one another. When based on fair schedules or quantities, a contract is a legitimate mode of carrying out building; but when the principle of competition or low-tendering is introduced, such as we generally see now, the system is destructive to all trades. The root of the mischief is in the competition: it is not a healthful competition based on skill or good workmanship, but on the lowness of price; and as long as our building trades tolerate the system, so long will the evils of "under-cutting," scamping, and incompetence last.

Architects are, of course, unable to do much without the co-operation of the building fraternity. So long as it is possible to obtain a tender a large percentage below every one else, the employer will not interfere, and the architect is to a large extent compelled to submit; but if the builders stood firmly together and refused to tender with men who undervalued their labour, and, in fact, tendered for the sake of the barest subsistence, the present "throat-cutting" business referred to would soon come to an end. A limited competition among honest and responsible builders is one of the methods that ought to be supported both by the building fraternity and the profession. The revival of piecework is a question that has been mooted, and in the face of the evils which threaten the skilled workmen, it has advantages that cannot be questioned. It puts a premium on skill of a certain kind, some contend; but is it not better that a working man should find his special vocation and be able to do it with facility and despatch, gaining for it the highest wage he can, than that he should be obliged to work on a building without any interest in a particular groove, and earn little more than the lazy wage-earner? The question, we know, is a disputed one; but the sooner it is discussed and settled one way or the other the better. The old complaint that the "British workman" only does the "smallest possible amount of work for the largest amount of wage" is unfortunately too true; but if he did his work well, no one would complain. Much of the grievance is due to putting him to mechanical work, or work that is done quite as well by less competent hands and paying him by time. No wonder, too, the outside recruits who enter the trades have something to answer for this result. The skilful craftsman loses all heart in his work when he finds that the mere labourer is allowed to do work on the same terms with himself.

The question of apprenticeship, already noticed in brief, is one that will have to be dealt with. Is the apprentice to receive any benefit for his training, or is he to be looked upon as no better than a "learner" or "pick-up" hand? Sometimes, it is true, the learner surpasses him by dint of perseverance or natural capacity; but putting these exceptional cases out of sight, it is also very certain that the great firms are less disposed to take apprentices as entailing too much trouble and superintendence. It is also a fact that many learners enjoy equal advantages with the regular apprentices. We can hardly say this is just to the apprentice, and it may partly account for the great falling off in the number of building apprentices. The facilities which ought to be granted to them are not always allowed, as, for instance, the permission to attend technical classes. On the whole, we believe the building firms have not very great faith in technical class teaching, and if the opinions of the trade were canvassed on the point, we think there is a stronger belief in the value of apprenticeship as the best means of learning the trade. These are topics, each of which would carry us into lengthened arguments. Mr. Rider, in his address, spoke of the trouble they had in London in the supply of plasterers, and amongst the ways suggested to remedy this state of things is to increase the number of apprentices. The falling off in the number of this branch is no doubt attributable to several causes, as the substitutes that have been made for plastering; the overlapping evil, to which we have referred, by which other trades, like bricklayers, enter the trade. We have here a strong reason for the importance of increasing or maintaining apprentices. Unless the building community provide special means of enlisting and training these youths, by a system of disciplinary apprenticeship, such as that which existed of old, and of encouraging the natural abilities of

their younger men by means of schools, the disintegration of the trades by competition and otherwise will go on unchecked.

#### THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Architectural Association was held on Friday evening, the President, Mr. Beresford Pite, F.R.I.B.A., in the chair. The following nine new members were elected:—P. T. Chew, O. S. Doll, R. Withers, G. L. O'Connor, W. N. F. Woodland, F. J. Corfield, S. A. Heaps, J. A. R. Ingram, and J. O. Ormrod. In consequence of the resignation of the office of vice-president by Mr. John Begg, who has proceeded on business to Johannesburg, Mr. G. H. Fellowes Prynn was unanimously elected to the vacancy, and Mr. C. C. Brewer was also unanimously appointed a member of committee, the nominations being made by the President on the recommendation of the Council. Mr. Banister F. Fletcher, in proposing a vote of thanks to Mr. Begg for a parcel of guide-books given to the library, expressed the hope that he would have God-speed, and would soon be back—a sentiment received with hearty applause.

#### AN UNWRITTEN CHAPTER OF ENGLISH ARCHITECTURAL HISTORY.

Under this title a paper was read by Mr. A. S. Flower, M.A., and proved to be a dissertation on the now "out-of-date and very unfashionable hobby of English Gothic architecture"; the author explaining that he proposed to give the results of some independent research into the history and characteristics of the Mediæval architecture of England. The address was illustrated by numerous lantern views from illuminated MSS. and actual buildings, many of them exhibited for the first time. Waiving, for the present, the great question as to whether any such studies were to be recommended at all, and assuming that a young architect wished to learn something of the old architecture of his country, how could he best be assisted? He would say: In studying architecture, be practical; put aside all considerations derived from archaeology, sentiment, or association, and simply use your own eyes and your own common-sense; learn by observation and by reasoning. Ask the buildings themselves why they are as they are, and what is their meaning. Imagine yourself with the builders, asking what they are going to do, and wherefore. To criticise buildings, you must try to grasp the circumstances of their erection, and look at them from the point of view of a constructor. Returning to the imaginary student, Mr. Flower continued: We tell him to go out sketching and measuring, and not to neglect to take notes of construction and materials; every one will agree in this advice. He then surmounts, let us suppose, every technical difficulty, until we find him able to draw with the utmost accuracy and most thoroughly artistic touch any subject he may meet with; he has seen and sketched hundreds of buildings, and acquired quite a respectable acreage of details; he can freely reproduce from memory any portion of his sketch-book; he is, in short, a consummate draughtsman; but there is still something wanting. Does he really understand the buildings of the past? For all that he has done so far, he may be no more capable of seeing into the ideas and motives of the men who built them than the most prosaic and mercenary photographer. The difference between the two is not necessarily more than one of manual process; the mental attitude of each may be substantially the same. Unaided observation, accompanied by however great technical skill in recording, will not enable a man to read the riddles of ancient buildings. When curiosity begins to be aroused as to how, or when, or why, some particular work was built, he comes to feel the need of definite guidance. In fact, he has recourse to books. He requires them for several reasons: to learn methods of arranging, connecting, and utilising his own disjointed memoranda; to obtain many indispensable facts, which he could not possibly discover for himself; to bridge over gaps in his own experience; to become acquainted with principles and theories which may throw light on what he has observed, or direct him into fresh fields of inquiry. Books on the history of architecture are not fetters forged by malign opponents for the enthralment of art; nor are they simply labour-saving tools to assist lazy men in the mechanical business which they call their art.



Rightly used, they are the means by which an architect may learn the true nature of his art, its difficulties, its qualities and powers, its grand possibilities. But architectural books lead us at once to the thorny question of styles. "Read a little history," the student is sometimes told, "but steer clear of anything to do with divisions of styles. All art is one; therefore all Gothic architecture is one, and it is criminal wickedness to attempt to divide it." Advice of this sort in many cases cannot possibly be attributed to any dislike or contempt for the kind of architecture in question. It is principally based on a misconception, which it seems worth while trying to explain. In most branches of knowledge, if not in all others, it is generally agreed that subdivision and definition are requisite in order to render learning and teaching possible. Of course, if it has to be conceded that Gothic architecture is a thing by itself, not subject to the common rules of human experience, the argument that methods like those found necessary in other arts and sciences can be successfully applied to it, falls to the ground at once. But this those who talk about a one and indivisible style have still to prove. In the meantime I prefer to believe in the sound old Roman maxim, *Divide et impera*. If we suggest, then, that for the sake of a more intimate acquaintance with the character of Gothic building, the learner should analyse it, should consider its component parts separately and in their relations to one another, instead of only gazing on it as a whole, beautiful but incomprehensible, we must consider the means at his disposal to enable him to grasp his subject. Directions, guide-posts, and landmarks innumerable await him; but unfortunately the greater number of them, and of these the most conspicuous and most generally followed, have been set up on the wrong roads. This is the real cause of the distrust now so strongly manifested in all definite study of Gothic. Many men have a vague sense that there is something inadequate, something unsatisfactory, in the orthodox teaching on the subject, and jump to the conclusion that, therefore, all teaching of it must be wrong and misleading. The idea of improving our present methods does not seem to anyone worth a thought. As it is of no material disadvantage nowadays to an architect to know nothing about Gothic, the elder men either leave it alone, or go on, content with the notions about it remembered from their boyhood, thinking the whole subject so simple, so easily mastered, that everything which could possibly be known about it was long ago finally settled and laid out, cut-and-dried, leaving no room for further research or progress. But this attitude has had results for the younger generation. There are still men, even amongst the youngest of us, who take an interest in our inheritance from the middle ages, and there is besides a much larger and rapidly-growing body outside who do the same, and who look to us for instruction and guidance. To these architectural students, craftsmen, and amateurs we have nothing to offer but a confused, incomplete, and largely untrue account of our ancient architecture. Shoals of books, indeed, there are; but all of them, down to the very latest, are but echoes of the imperfect description of Gothic architecture composed, and to a great extent invented, by the antiquarian dilettanti of a hundred years ago. The very important consideration, that in so many ways we have now the means of knowing more than even the cleverest of our great-grandfathers could possibly attain to, has, in the general treatment of this subject, been most strangely and sadly overlooked. No wonder is it, then, that an intelligent student, turning to the recognised authorities, and finding himself in a maze of unreal and contradictory statements, often quite at variance with the evident testimony of the buildings as well as with the authentic records of history, becomes utterly disgusted, and is tempted to say, "These things have nothing to do with architecture." Illustrations have been immensely improved, many new facts and descriptions have been added; but as to all matters of generalisation of principles and of application to practice, we are using a system which is demonstrably absurd, and which deserves to be obsolete. I speak from a considerable experience of the actual difficulties found in pursuing this subject, which evidently oppress even zealous and hard-working students, and these remarks are prompted by the desire to do something, if possible, towards smoothing the path to a reasonable understanding of it. We have

stayed marking time, while in every other branch of knowledge a great advance has taken place, and it is quite time that we should bring ourselves up into line. But the remedy is not to be found in general abuse of antiquaries. Their pioneer work has been of indispensable importance. The fault lies in our having yielded up to them the duty of commanding and directing, which we ought to have exercised ourselves. Hence so many of the generally received ideas about Gothic architecture come from laymen, not from architects, with the natural result that they are thoroughly amateurish, and completely ignore the one thing which we care most about—design. The lay mind, even in the case of the best educated and the cleverest men, seems incapable of thinking of architecture except only as a species of superficial adornment, applied in an ascending scale of ostentation. Every imaginable question in architectural design is reduced by the average Englishman to the single and, to him, all-sufficient one of comparative richness or plainness. Imbued with such ideas, our lay antiquaries, when, unfortunately, not content with collecting and verifying facts, they took to formulating systems, naturally classified and described all our ancient architecture according to the increasing quantity of ornament, which they supposed they could recognise in successive periods. They were practically unanimous in their division of all Gothic work into Early or plain, Intermediate or more ornamented, and Late or profusely ornamented. There was a vast amount of discussion as to the precise terms to be used to express these distinctions, and as to the particular dates at which one should be held to have merged into another, and almost by accident the designation of the latest style, which very nearly settled down into "Florid," has come down to us as the much more architectural "Perpendicular"; but the method all round was the same; not to study the differences of design in the buildings, and trace thence the divers principles which had governed their builders; not to study the social history of the nation, and learn thence the various events which had influenced its modes of building; but to start with a hard and fast, ready-made schedule of three heads, and cut, cram, maim, and squeeze so as somehow to get it filled. It was reserved, however, for a later generation, almost our own contemporaries, to carry this tripartite system to absolutely symmetrical perfection, by over-riding clear historical facts, and declaring the existence of three separate styles, each exactly contemporaneous with one century of the Gothic age. Complaints of this kind may perhaps be called unreasonable or hypercritical. The books in common use, one may be told, give us quite as near an approximation to truth as we need either expect or desire. To try, therefore, how far this easy confidence is really justified, I must ask you to consider, as briefly as possible, just one instance of irreconcilable difference between views generally accepted and plain facts of history. To quote from a very well-known manual:—"The change from one style to another was not immediate; it generally took nearly half a century to effect the transition, and the last half of each of the five centuries was such a period of change or transition. Buildings of the last ten years of a century generally belong in style rather to that which follows." Passing on to particulars, our authority further tells us:—"In the 14th century the general character is of the style called Decorated; the last half of it is the period of transition from the Decorated to the Perpendicular." Nothing could be more beautifully simple and regular; but nevertheless it used to be a great puzzle to me how, if all this were true, one never met with a "Decorated" building after the middle of the century, while, without any premonitory signs of change, everything after that time was to be found designed on entirely different—indeed, almost opposite—principles. No reaction in taste could by itself account for such a startling change, and from no architectural writer, nor any general historian, could an explanation of the mystery be obtained; indeed, none of them seemed to recognise the fact. Only after a good deal of search in the by-paths of history did I come across the clue—namely, that the "Decorated" style, after an existence of only some five-and-thirty years, was suddenly cut short and literally killed by "The Black Death," that awful pestilence which went near to depopulating England in the years 1348-9. I believe that anyone who will take the trouble to study the history of these few years will have no difficulty in learning both how it came about that

the Decorated style never ran its natural course of logical development, and also what were the causes of the special characteristics of its successor. The chapter of the history of English Gothic architecture which has never yet been written is the one which shall treat of the whole matter on the sole basis of design. No one, except an architect, can write this chapter, but only one has ever fairly essayed it—I refer, of course, to the late Edmund Sharpe. His description of Gothic building is the most architectural one which we possess, and full of valuable suggestions; but hardly anyone regards it as more than a partial success, and it has certainly not succeeded in supplanting, as its author hoped, the popular amateur version. Sharpe made a bold and original endeavour to place the study of Gothic on better foundations, but his own work was doomed to failure, because it rested only on one particular section of design, and that not in reality the most important. In seeking a key to the understanding of Gothic architecture in window-tracery alone, and grouping all buildings in accordance with that one standard, Sharpe showed that, after all, he was, however unconsciously, still under the influence of the amateur school, who saw in tracery, as they do to this day, the principal evidence of that comparative amount of decoration which they denominate "style." But if I rush in where Sharpe failed, if he feared not, to tread, I shall be in danger of the apt quotation of an ancient proverb. If anyone is expecting me to say that I have got the missing chapter in my pocket, I fear he must be disappointed. At this stage the lecturer exhibited on the screen the first of a series of original lantern-slides, one of which he had just had made from an MS. in the British Museum, and never exhibited before. It was taken from Matthew Paris's "Life of King Offa" (Cottonian MS. Nero D.i.) The author and illustrator of this work was, he continued, a Benedictine monk of St. Alban's Abbey, who died a few years before King Henry III., and is said to have been equally distinguished as theologian, historian, artist, poet, and mathematician. The original is an outline drawing in brown ink, measuring about 9in. by 5in., so that the large figures are about 4in. high. The subject is Offa, King of Mercia, directing the building of St. Alban's Abbey, and it is hardly necessary to say, the drawing illustrates a building-scene of the days of its author, and not of the remote period which he is describing. Its main interest lies in fact that we have here an unquestionable contemporary representation of a Mediæval architect, together with some important evidence as to his position and methods of work. It is worth while taking note of even the details of this drawing, because some of the most fashionable modern theories about Gothic architecture depend entirely upon the supposed non-existence of architects in the Middle Ages. It has quite recently been confidently stated, though apparently upon no better grounds than an *à priori* assumption, that "there never was no such person," or that, if there was, he was quite undistinguishable in any way from an ordinary mason. We have been told that he could never, like a degenerate modern architect, have been seen upon the works with his coat on—because he could not have possessed one, nor even in his shirt-sleeves, for a similar reason! Now the man before us, to consider his outward aspect first, is not of this sort. In all particulars of dress and general fashion, he bears a close resemblance to the king and his attendant. So far, too, from looking just the same as any one of the crowd of workmen whom we see engaged in their various handicrafts, he is unmistakably a man of learning and culture, whose work lies in designing and directing, rather than in simple manual labour. He is discussing, on very friendly terms, some point concerning the building with the king; the latter apparently has made some suggestion, but the architect is giving his opinion with no undue show of deference, while the courtier keeps in the background till the question is settled. Even were there no other signs to guide us, this drawing is enough by itself to suggest that a great Gothic building was not, as is so often pretended, a mere concretion of material, piled up by the unorganised and undirected labour of many similar units—exactly in the manner of a coral reef—but was, on the contrary, the actual creation of a single intellect, as truly and absolutely so as a play of Shakespeare or an oratorio of Mendelssohn. There is not in reality the slightest disparagement of the other workers who took part in raising such a building in saying



that their work could not have come into being without an original mind to give the necessary impulse and control; it is no more than saying that the cleverest actors and the most skilful musicians depend after all for the opportunity of exercising their powers on the previous labour of the individual dramatist and composer. When we know that Matthew Paris not only witnessed important building operations in his own abbey, but was in great favour with Henry III., and present at his court during the erection of the Abbey Church of Westminster, we may readily imagine that in representing the legendary scene of Offa's foundation of St. Alban's, Paris drew upon his recollections of the frequent interviews he must have witnessed between Henry and the architect of the great church, in the building of which the king took such deep and constant interest. But notice also this architect's compasses and square—they denote more than that he is merely an expert in building—they mark the geometrician. This is a point we must return to. To come back now to Matthew Paris's drawing. Here we may find the clue, without which we can never learn to see the mind of the Mediaeval architect in his work. He was essentially a geometrician. In the great intellectual movement of the 13th century, no branch of learning, except theology, was more widely cultivated than geometry; and this science, both then, and for long afterwards, occupied an altogether higher position relatively to other intellectual pursuits than it does at the present time. Among the many side-lights which the recognition of this fact seems to throw upon the development of English architecture is one with regard to the vexed question of influence from the East. Most people have at some time felt, if they have not, through lack of tangible proofs, actually allowed, that Oriental suggestions must have played some part in the formation of English Gothic architecture. As an explanation of this, it has generally been loosely asserted that the English Crusaders tried to reproduce at home the Saracenic architecture which they had seen and admired in the course of their campaigns; a supposition which, besides being unsupported by a shred of evidence, must seem, to anyone acquainted with the average military mind, absolutely incredible. But when we think of the highly-prized Arabic geometrical treatises then finding their way into every monastery and university (the latter being at the time thronged by lay scholars, in numbers almost impossible to realise), there is little difficulty in imagining how the subtle influence of books, written by men whom the most learned of Europeans revered as their intellectual masters, became the means by which Oriental inspirations were grafted upon the rising tree of English architecture. Until we can form some idea of the influence of geometry during the Middle Ages, nowhere stronger than in our own country; until we can partly realise the fascination in the study and exercise of it which then possessed every educated mind, lay and clerical alike, we shall never be able to understand the conditions under which our Gothic structures were designed. Geometry is the indispensable key to the thoughts of the men who built them; indeed, I will go so far as to say that, were I asked to define English Gothic architecture in the fewest possible words, my definition would be:—"A species of building wherein every part, from the greatest to the least, is dominated by the same geometrical motive." I beg you to notice, however, that I do not say, simply, "dominated by geometrical motives," nor "by a motive," but "by the same motive." A great deal turns upon this. It will not be at all surprising to hear this definition objected to as being neither new nor true. It may be contended, on the one hand, that everything possible to be said about the connection of geometry with Gothic architecture has been already said; and, on the other, that true art soars far above the trammels of such a cold, hard, prosaic science. Both objections cannot be dealt with together. The former, of course, the less important, may perhaps be sufficiently answered in a few words; but, to establish a case to meet the latter, which I expect would be fervently urged, would require the production of a large body of pictorial and other similar evidence, such as, unfortunately, I am unable to bring before you in the limits of the present paper. But there may still be time to say a little about previous references to the relation of geometry to Gothic design. The mention of it at once calls up visions of plans and sections of

churches, crossed over like maps by squares and triangles, with arguments on the supposed rules of their setting out, which have rarely succeeded in carrying conviction, chiefly on account of the apparently arbitrary and usually contradictory systems of measurement adopted by rival theorists. It suggests also that much ingenuity has been devoted to one particular class of geometric design by the illustration of the infinite variety of patterns producible from contained and intersecting circles. Nor will it be forgotten that some authorities have gone so far as to speak of a "Geometrical period," though only as a short-lived minor division of English Gothic. We may be grateful for hints from all these sources; but they neither exhaust the subject nor give us the information for which we seek. It should be remembered that, owing to the general destruction of our ancient libraries, and the consequent dearth of direct home evidence, people have been implicitly relying upon certain works on proportion, which happen to have come down to us from German and Italian architects of the latter part of the 15th and of the 16th centuries, to explain the principles of English architecture in the 13th and 14th centuries! To arrive at an understanding of the actual manner in which Old English architecture was influenced by geometry, not for a limited time only, but from its birth to its decline; not through any one form or figure only, but through many; not merely generally or at random, but with a single order of forms dominating, as a keynote, each particular era in succession, we must discard many old methods, old prejudices, old associations. We must look for new facts in our own buildings, and for new light upon them from our own social history. We must establish our principles solely upon the firm base of observations, instead of stubbornly dogmatizing in the old vicious manner, and mangling facts to make them square with unwarrantable theories. In doing this we may gain even more than truer and fuller knowledge of the past; we may find sure helps and great encouragement for the future.

A short discussion followed, in which the PRESIDENT, MESSRS. PAUL WATERHOUSE, W. H. SETH-SMITH, A. H. HART, and B. FLIGHT FLETCHER took part, and a cordial vote of thanks was accorded to the lecturer, who briefly replied.

#### ADAPTABLE SPECIFICATIONS. — XXX.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued.)

**T**HE fungus which produces *dry rot* (*Merulius lacrymans*) is easily transferred by contact from a decaying timber to a sound one, provided that both are damp and surrounded by a warm, close atmosphere. But the first outbreak of dry-rot in a building is seldom produced by contact of this sort. The disease arises, in popular language, "of itself," which really means that it springs from invisible "spores" or seeds, floating about in the air. But it is not everywhere that these seeds will grow—even on damp surfaces of wood. They require the presence of an alkali: and this they very often find in the ammonia which proceeds from defective drains or impure soil. An insanitary building is therefore a building specially likely to be attacked by dry-rot; and one thing required in order to prevent it is to see that no organic matter can decompose to give off bad smells in the neighbourhood of the carpenters' work.

The *dry-rot fungus* does not like draughts. The architect who is guarding against it will, therefore, see that his airbricks are so placed that there are no quiet corners under the floor to which the wind never penetrates. It does not like seasoned timber; but prefers, at any rate, to begin upon the sapwood, and not to attack the harder parts of the tree till it has well established itself on the soft ones. The prudent architect will, therefore, supply it with no sapwood to begin upon. It does not like dry places, and its only chance of flourishing there is to send down fibres into damp soil or damp walls to bring up moisture to the drier timbers on which it is growing. The architect will, therefore, find in surface drainage of the site, in surface concrete, and in damp-proof courses, some of his most powerful weapons in fighting against it. Dry-rot is peculiarly fond of attacking the ends of a beam—sometimes, perhaps, because the ends have been cut off with a saw which has just

before been used on an infected piece of wood. It would, therefore, be a wise precaution to protect these ends—either by *creosoting* them or treating them with mineral antiseptics, even when the timber in general was not dealt with in this way. *Chloride of mercury* and *chloride of zinc*, and likewise *sulphate of copper* and of *zinc*, all in solution, have long been employed in preserving woodwork from dry rot. It is expensive, however, to force any of them thoroughly into the pores; and even when this is done, they make the timber brittle. It loses its elasticity, and easily breaks across. Most metallic salts, too, will quickly destroy any ironwork which comes in contact with the timber to which they have been applied. Paving-blocks are usually protected by dipping them two or three times in boiling tar; and even this slight protection might be of considerable service to the ends of beams which are about to be built into walls. A process called "vulcanising" wood has lately come into use, especially in America; and great claims, both as to protecting and as to strengthening the material, are made for it.

Leaving here the faults and diseases of timber, and particularly those of Baltic fir or yellow deal, a few words may be said on the subject of *oak*. Of the kinds which chiefly find their way to this country, *Riga oak* is probably the best, *Memel* is the next in quality, *Dantzic* and *Stettin* are somewhat inferior, and *Canadian* is the worst of all. *Riga wainscot* is of a soft yellow tint, and remarkably uniform in colour. It is more compact than the other kinds, the annual rings being thinner and closer together, say,  $\frac{1}{8}$  in. wide as compared to  $\frac{1}{4}$  in. in *Memel oak*. *Memel wainscot* is coarser, and somewhat hard and horny in texture, and its colour rather approaches to brown. From the manner in which it is carried and shipped, it is often unpleasantly stained and discoloured; but as it costs only two-thirds as much as *Memel oak*, contractors commonly use it in preference to that material. Two qualities are shipped, known respectively as "Crown" and "Half-crown," or first and second. *Hamburg oak* is coarse and inferior. It is much discoloured by water-carriage, and often riven or cracked. It is more subject than *Riga* and *Memel oak* to heart-shakes, and is frequently eaten into by some large boring insect. The figure is coarse, poor and sprawling, and the timber, as it arrives here, is not sorted into qualities. Very much depends on the way in which oak is cut up into thicknesses. The way which suits the timber merchant best is by no means that which most brings out the beauty of the grain, or which tends to prevent unequal shrinkage. The saw-cuts should be approximately parallel to the medullary rays, which radiate all round from the centre of the tree to the sapwood. If oak is so cut up that these rays run across the thickness of the boards, it will split, twist, and warp. Oak boards should be so cut that their width extends nearly from the centre to the circumference of the tree, on a radius of it in its cross-section. There are several modes of setting out the saw-cuts so as to manage this.

In superintending the execution of carpenter's work much attention is required to the formation of the joints. As Tredgold remarks, they should be so framed as to give the largest possible bearing surface, provided that this surface is of the form best adapted for resisting the strains. Detail drawings do not always show the joints very clearly, and when that happens they need special study as the work goes on. In the old books on carpentry a great deal of consideration was given to ways of lengthening beams. A number of such joints were discussed, suitable for beams exposed to tension or longitudinal strain. Then came those proper for beams exposed to cross-strain, and next for those exposed to compression. Most of these devices for lengthening timbers were of much less importance now than they were until half a century ago, because roofs of great span are now generally formed of iron or steel. The simplest way of lengthening tie-beams—where this is necessary—is by means of *iron fish-plates* at top and bottom, with the ends of the plates slightly turning up into the timber, the fish-plates and the beam being all bolted together. It would require some skill, however, to make this type of joint agreeable in appearance, and the carpenter, therefore, prefers the less trustworthy method of *scarfing*, in hopes that the joint will thus remain imperceptible. Most scarfs are too clever. They are above reproach on paper, but require more exactness in working and fitting together than can really be obtained. The old rule was to make



a scarf, in pine or deal, twelve times as long as the depth of the beam when bolts were not used, and six times as long when they were. The scarfs which dispensed with ironwork were tightened up by wedged in ~~as~~ of hard wood, preferably oak. Wall-plates and pole-plates are generally halved and bevelled together at the end of each length, the bevel having the effect of a double dovetail. In most positions, dovetail joints are objectionable, because the least shrinkage allows them to draw apart; but this does not happen in those which connect the ends of wall-plates, because here the dovetails and the spaces into which they fit will in all probability shrink about equally. To keep the dovetails of a plate in position the weight of the joists or rafters which rest on the plate will generally be sufficient. The lengthening of struts or of posts exposed to compression is seldom needed. It is best managed by making the ends of both timbers square, and by inclosing them at the junction by fish-plates or a socket of wood or iron.

It may seem perfectly needless to point out that where a purlin and the common rafters which bear on it have to be notched together, it is, in ordinary cases, on the rafters, and not the purlin, that the notch should be cut. But there is so much carelessness or so little knowledge of the reasons for what they do to be found amongst ordinary workmen, that the architect is almost as likely as not to see his purlins weakened by being cut away at every foot of their length to let the common rafters pass through. The same absurd mistake is often made where the purlins themselves pass over a principal rafter. If there is not space to let them pass over of their whole depth, it seems quite an open question with many carpenters whether they should cut away part of the depth of the purlin just where it bears on the principal, and consequently is strongest, or part of the principal rafter, perhaps half-way between ridge and tie-beam, at the point, therefore, where it is likely to be weakest. The special failing of the inferior carpenter, in short, is to suppose that he can notch and mortise and cut away his timbers as much as he likes, and yet, if they were strong enough originally, they will remain strong enough to the end, in spite of all he can do. When we remember, too, that after the carpenter comes the gasfitter, who will coolly saw out any number of notches of whatever depths he finds convenient to let his pipes run straight across the main timbers of the building, it is wonderful, not that roofs and floors sometimes give way, but that their failure is so exceptional an occurrence as it really is.

#### WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—X.

THE extent to which the tests which have been illustrated are used depends in a large degree upon the extent and importance of a contract. In extensive works we cannot be too careful in hedging round structures with all possible safeguards. In these works, not only all the ordinary tests before-mentioned, but also many special ones of all conceivable kinds which suggest themselves to the mind of the engineer are adopted; but it is nevertheless a fact that the most severe and elaborate and varied trials to which steel can be subjected to-day after it leaves the manufacturer's hands seldom reveals failure to stand the most severe requirements of the great public inspecting bodies. The long-continued and uncompromising vigilance of the Board of Trade, of Lloyds' Registry, and of the Admiralty, of large private firms, and of foreign official bodies have tended to bring about this result. The consequence is that the interests of private consumers are protected in so efficient and complete a manner that anything like elaborate testing is rendered superfluous in their case. Steel, manufactured by firms of repute, can be accepted as of reliable quality.

Steel manufacturers do not, however, guarantee to supply steel at ordinary rates to stand very varied and very precise tests such as are required in some specifications, the items in which are often dictated by men more technical than practical. Steel of a definite quality is always guaranteed to stand ordinary requirements, but steel for special testing is charged for at advanced rates; for example, Messrs. Dorman, Long, and Co., Limited, guarantee all the steel used in their manufactured goods to stand from 28 to 32 tons tensile strain per square inch, and 20 per cent. elongation in a length of 8in. These are the requirements of the Admiralty and Lloyds',

and embody substantially all the information which an engineer requires to know in reference to the quality of materials for ordinary work. No note is taken of the yield point or of the contraction of area, nor of the effects of cessation and reimposition of stress; the total stretching, which corresponds to a given strain, tells the bridge and roof builder all that is essential. Every separate quality of steel is stamped with a special brand by the manufacturers; monograms are used, generally with initials and crown. By reference to the price-lists of each manufacturer the quality can be identified by means of these monograms.

These remarks do not apply equally to iron of ordinary brands, which is always more or less unreliable, for reasons previously given. The difference that has been brought about in this respect is remarkable; but a few years since iron was trusted, steel was regarded with suspicion. Lloyds' Registry did not officially recognise the greater tenacity of steel over iron until the close of 1877. So recently as 1878 the failure of a number of steel sections under test so frightened the Admiralty authorities that the wisdom of a return to iron was discussed and partly carried into effect. In 1880 the late Mr. Denny, the great Dumbarton shipbuilder, in a paper read before the Institution of Naval Architects, was bold enough to say that, after having used about 7,000 tons of steel, "our whole experience leads us to reverse the ideas largely held regarding steel and iron, and to look with confidence on the steel, and doubt on the iron. Our foremen and workmen hold this view of the matter very strongly, and speak most contemptuously of going back to iron." In 1881 Mr. Daniel Adamson stated before the Iron and Steel Institute that he had made more than 70,000 tests of steel and 20,000 tests of iron, and he looked on iron as a dangerous and treacherous metal to use: for long after steel had come into very general use for constructional purposes, rivets of wrought-iron continued to be employed in the steel work. The earlier steel rivets were not reliable: they were too brittle, and the heads frequently flew off or cracked during closing and snapping. Now, however, steel for rivets is made of such excellent quality that the use of those of wrought iron is becoming exceptional; but, notwithstanding that steel has won its way to favour, some of the old suspicion still clings to it, as evidenced by the restrictions placed upon its employment, and the severity of the requirements of official bodies.

The stipulation of the Board of Trade, in relation to steel for structural purposes, is that it shall not be strained beyond one-fourth the ultimate or breaking stress. This is, therefore, very general in character, taking no account of differences due to the nature of the stresses, whether tensile or compressive, live or dead. All arrangements of a special character must be made by consultation with, and approval of, the Board of Trade officials. In the case of the Forth Bridge a considerable range was allowed between steel for tensile and for compressive strains; from 30 to 33 tons in the first, and 34 and 37 tons in the last. For stresses varying between nil and maximum 20 tons per square inch of section was assumed as a maximum stress if the change occurs frequently, and 22½ tons if it occurs rarely. For stresses alternately tensile and compressive 10 tons ultimate was assumed if the changes were frequent, and 15 tons if seldom; and one-third the ultimate stress to be the working stress. In rivet steel the ultimate strength was to be 27 tons per square inch with 30 per cent. of elongation, and shearing resistance from 22 to 24 tons per square inch.

The following account, condensed from the instructions which are issued by the committee of Lloyds' Register to their surveyors, is of interest, as indicative of the extreme care with which the inspection of steel is performed before it is allowed to be used in the vessels built under that register. It does not differ in the main from the instructions of other official bodies, nor from those which bind inspectors on great public works constructed of steel in which similar care is exercised.

Every charge of steel is tested by the surveyors, but not until each plate, bar, or angle from a charge has been tested, marked, and passed by the manufacturers as ready for testing by the surveyor and stamped by the manufacturers in two places where the brand cannot be conveniently sheared off—the mark indicating the brand of steel, the name or trade mark of the firm, and the place where made. Lloyds' surveyors are, when practicable, in constant attendance at the steel works in order to see the various tests carried out; these comprise the tensile, the temper, and cold

bend tests. If not present during the whole of the time, these tests have to be applied by them to not less than one plate, angle, or bar in every batch of fifty, or any batch of less number; any such sample when selected is expected to be followed right through by the surveyor. Should any sample fail to fulfil requirements, the whole of the material in the charge from which such sample was selected is rejected, or further tests are to be applied to a sample from each of the other charges of which the batch is composed. In the event of any of these samples also failing, the whole of the material from the same charge or charges is to be rejected as in the first instance; further, the manufacturer has to supply a certificate to the surveyor who has to test such batches, testifying to the fact that the society's requirements as to the testing of steel have been complied with in the case of the batch in question. In the case of all steel supplied to Lloyds'—Lloyds' brand, which has to be stamped in two places, indicates that the required tests have been complied with by the manufacturer; if the steel fails, the brand is defaced with centre-punch marks. The instructions of the Admiralty regarding tests for plate, beam, angle, bulb-bar, and rivet steel used in building ships for her Majesty's navy are the tensile and forge tests, and the ductility of every plate, beam, angle, &c., is to be ascertained by the application of the temper test to the shearings, or by cold bending under the hammer; all steel is to be free from lamination and injurious surface defects. One plate, beam, or angle, &c., is to be taken for tensile testing from every invoice, provided the number of plates, beams, or angles, &c., does not exceed fifty; if above that number, one for every additional fifty or portion of fifty. Steel may be received or rejected without a trial of every thickness on the invoice; where required by the overseer, material from every "blow" or "charge" may be so tested. The pieces of plate, beam, or angle, &c., cut out for tensile testing are to be of parallel width from end to end, or for at least 8in. of length. The Admiralty require in steel ship plates a low tensile strength, and the same quality is suitable for bridges; its tensile strength is from 26 to 30 tons per square inch, and a 20 per cent. extension in 8in. The requirements of Lloyds' for steel ship plates are tensile strength of not less than 28, and not exceeding 32 tons per square inch of section with an elongation of at least 20 per cent. on a length of 8in. before fracture in samples  $\frac{3}{16}$  of an inch and above in thickness, and 16 per cent. in samples below this thickness. Steel angles for framings may have a maximum tensile strength of 33 tons per square inch of section, provided they are capable of withstanding the bending tests and of being efficiently welded. Strips cut from the plate or angle are to be heated to a low cherry red, and, being cooled in water of 82° Fahr., must stand bending double round a curve, of which the diameter is not more than three times the diameter of the plate tested; cold bending tests are made in addition on every plate and bar tested for tension. David Colville and Sons manufacture special bridge steel of a strength of 27 to 31 tons, with not less than 20 per cent. extension in 8in.

It is singular, by the way, that usually no difference is made in the quality of steel used for tension and that used for compression members of structures. In favour of this practice there is not only reason but precedent. Among the early wrought-iron bridges several examples occur of wrought-iron being used for tension members and cast-iron for compression; moreover, when ductile wrought-iron or mild steel suitable for tension are used for compression it is always necessary to add excess of material in the form of bracing, to prevent risk of crippling, which is what would otherwise occur long before the crushing stress was reached; this bracing adds to the dead weight of the structure and increases expense. When wrought-iron came to be used exclusively it was the practice to allow different values for tension and compression—5 tons for the former, and 4 tons for the latter; from 3 to 3½ tons for the lattice members. At present the stresses are frequently reckoned uniformly at 5 tons.

Steel is not only from 30 to 40 per cent. stronger than iron, and four times as ductile, but it is a material which is capable of being heated with so exact precision in the open-hearth furnace that any given quality can be made to predominate, whether hardness or ductility, and to almost any extent. Extreme instances occur in the manganese, and chrome, and Harvey steels; but it is the moderate differences only, those which relate to ordinary constructional work, that concern us



Speaking generally, steels for these purposes, whether in the form of plates, bars, or angles, and other sections range from 25 to 30 tons tensile strength, with 25 per cent. ductility in a length of 8 in. Steels of 35 to 40 tons tenacity were used a dozen years ago; but it was early learned that these were not so reliable under the work of the plater and smith, nor so ductile as the softer steels. Except for special purposes, therefore, such hard steels are not manufactured for compressive members.

In these remarks, respecting the classification and nature of tests, there is one matter of which no account is taken—the chemical composition of steel; no one outside of the works tests steel by analysis unless something goes wrong with the physical tests. There are two reasons for this: One is that the chemical composition is a matter which concerns the manufacturer primarily; the second is that chemistry alone does not determine the physical conditions of strength, ductility, &c. Abundant evidences of this might be given, but two or three of the most obvious only need be adduced. Yet it is none the less true that, generally, chemical composition must lie at the basis of any given grade of steel; this is evidenced by the fact that slight changes in the percentages of the elements present influence results. It is not apparently so much the actual ultimate percentages present in the finished products as the reactions which occur between those elements during the process of manufacture which affect results; after the chemist has done his best, always the ultimate verdict is given by the tests. The remarks to follow in the next article will elucidate these points.

J. H.

#### STABLE CONSTRUCTION AND SANITATION.—IV.\*

##### VELOCITY AND VOLUME OF AIR.

THE maximum velocity permissible for the renewal of air within any building may be taken as 5 ft. per second. With a well-designed system of natural ventilation such a velocity imparted to the incoming or outgoing air should



Fig. 13.

not create an objectionable or dangerous draught in any part of the interior.

For purposes of natural ventilation in this country it is considered that during a period of at least nine months of the year it may be safely anticipated that there will be a difference of not less than 10° Fahr. between the temperature of the internal and external air of any occupied building, and also that, for the greater part of the year, the minimum velocity of the wind may be taken at seven miles per hour. On reference being made to the table of velocities for air currents, generated by various differences of



Fig. 14.

temperature and heights previously given, it will be found that a difference of level of 35 ft. between the air inlet and outlet, together with a difference of temperature of 10° Fahr., will create an air current of 5 ft. per second, after deducting the usual allowance for loss by friction. It has also been shown that an exhaust ventilator of good design is capable of extracting the internal air of a building at a velocity of 5 ft. per second when the wind is travelling at the rate of seven miles per hour; only on very rare occasions will it be found that one or other of these natural agents are not available for ventilation purposes, whilst for the greater portion of the year it is safe to assume that, in some degree, both forces will be in operation at the same time. By the utilisation

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of the wind force, together with the heat force afforded by the difference of temperature between the internal and external air, it may therefore reasonably be considered that a velocity of 5 ft. per second is obtainable throughout the whole of

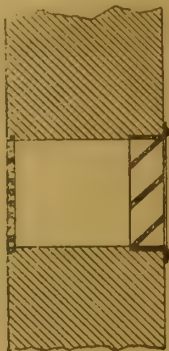


Fig. 15.

the year for the ventilation of stables and other buildings. The velocity of the air currents having been determined, the volume of discharge per hour for every square inch of fresh air inlet and foul air outlet is readily calculated from the formula—

Where—

$$D = V \times A.$$

D = Discharge in cubic feet per hour.

V = Velocity in feet per hour.

A = Sectional area of inlet or outlet in feet.

The following table shows the volume of discharge per hour per square inch of ventilating inlet and outlet for currents of air moving at different velocities, viz.:—

TABLE OF DISCHARGE PER SQUARE INCH OF INLET AND OUTLET FOR AIR-CURRENTS FLOWING AT DIFFERENT VELOCITIES.

Velocity of Air-Current. Feet per second.	Volume of discharge per square inch of inlet and outlet. Cubic feet per hour.
1	25
2	50
3	75
4	100
5	125
6	150
7	175
8	200
9	225
10	250

By reference to the above table it will be seen that every square inch of fresh air inlet and foul air outlet provided in the building will, under the conditions previously mentioned, practically admit and discharge 125 cubic feet of air per hour at a velocity of 5 ft. per second.

##### POSITION AND DISTRIBUTION OF AIR INLETS AND OUTLETS.

It has already been shown that for hygienic purposes it is desirable that an allowance of 1,666 cubic feet of stable space should be provided per

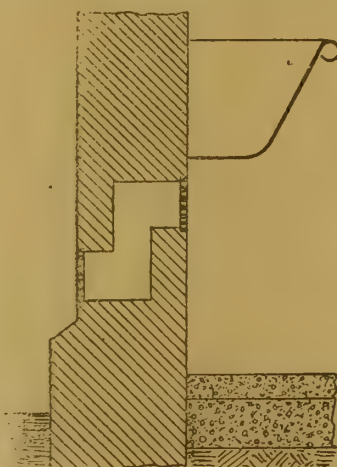


Fig. 16.

horse, together with such means of ventilation that 10,000 cubic feet of fresh air per horse per hour is admitted into the building, so that the air may be completely changed six times every hour.

As each square inch of inlet and outlet under normal conditions admits and discharges 125 cubic feet of air per hour at a velocity of 5 ft. per second, it follows that the total minimum area of inlet and outlet to be provided will amount to 80 square inches per horse; in all cases, however, where practicable, it is better to make provision for a minimum area of 100 square inches for every horse.

It now remains to determine the position

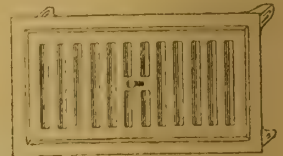


Fig. 17.

and total relative proportions of the fresh air inlets and foul air outlets which are found necessary for carrying these principles of ventilation into practice, so that thoroughly satisfactory results may be obtained. To procure the best results from any given difference in the specific gravity of the internal and external air, the inlets for the cold fresh air should be placed at a comparatively low level, the vitiated or heated air outlets being situated at the highest points of the building. The inlets and outlets should be placed as far apart as practicable from each other, so that the air may be completely diffused within the building, instead of merely passing direct from the inlet to the outlet. The fresh air inlets should be comparatively numerous,

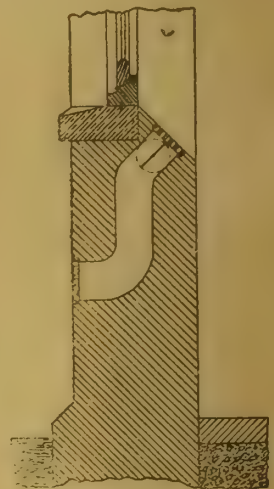


Fig. 18.

and so arranged that the air on entering is at once thoroughly distributed throughout the building in order to prevent stagnation of the internal air at any point; in this respect, it is necessary that every corner of the building should receive due consideration.

It is sometimes suggested that the total area of the outlets should slightly exceed the total area of the inlets, so as to allow for the increase of volume which takes place in the case of cold air after admission to a warm building; but to insure the most satisfactory results in a system of natural ventilation it is desirable that the total area of the fresh air inlets should exceed the total area of the foul air outlets. This is necessary in order to avoid, as far as possible, any risk of down-draught, and also to compensate for the extra friction caused by the distribution of the total inlet area over a large number of separate inlets, each having a relatively small area; for these reasons, it is better that the total area of the fresh air inlets should be one-fourth greater than that of the foul air outlets. Taking the minimum total area of foul air outlet per horse at 80 square inches, the minimum total area of the fresh air inlets should, therefore, be 100 square inches; or, in situations where a minimum total area of foul air outlet of 100 square inches per horse can be provided, it should be so arranged that the fresh air inlets have a total area of 125 square inches.

Whilst the total inlet area is distributed over a large number of separate orifices the total outlet



area should be provided by means of a few large-size extracting shafts judiciously placed for the easy and thorough removal of the heated and impure air. The lower end of each extracting shaft should be enlarged so as to form a trumpet-shaped mouth, in order to assist the passage of the outgoing current of air. When the best possible results are required to be obtained from the extracting shafts they should be inclosed with wood, felt, or some other non-conductor, so as to prevent any appreciable loss of heat from the ascending warm air.

The ventilation of buildings is sometimes

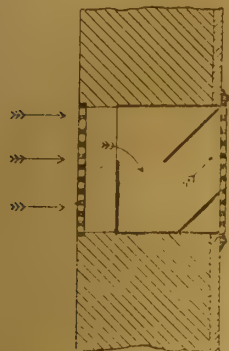


Fig. 19.

designed so that the ingress and egress of the air may be regulated by means of valves; but in many cases it is desirable that the minimum amount of inlet and outlet area mentioned should be so ordered that it is practically constant and incapable of being greatly reduced. In places where the admission of air can be controlled it is frequently found that the stablemen will close every possible opening so as to produce a feeling of warmth within the stable, without considering the vitiated condition of the internal air, or the evils that are produced thereby, the result being that a most unhealthy atmosphere must necessarily be breathed by the animals confined therein.

In addition to the ordinary provision made for permanent ventilating purposes, all the windows, together with the fanlights over the doors, should be made to open, so as to give additional means of

within the ventilating flue, or the provision of baffle-plates in the ventilator so that the velocity of the incoming current is broken at the point of entry, and the air more gently diffused within the building.

In certain classes of stables and cowhouses the

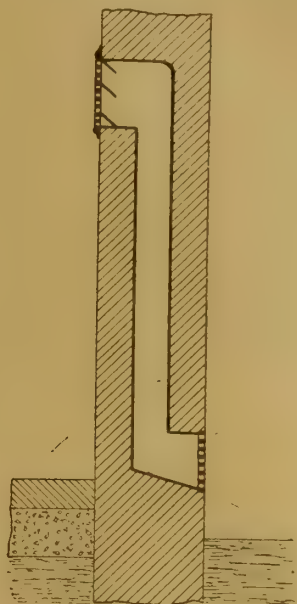


Fig. 21.

current of air is allowed to enter direct by means of a continuous ventilating course, consisting usually of a series of glazed stoneware perforated air-bricks. Figs. 13 and 14 show ventilating bricks suitable for this purpose: they may be obtained in different sizes to suit any thickness of wall. Fig. 15 is a section through a louvred ventilator which allows the air to enter direct, but the current is deflected upwards by passing through a number of louvres on the inside. The

air inlet is shown in Fig. 16, and consists of an internal and external air-brick or grating connected with a traverse or drop-opening formed within the thickness of the wall. In some cases the outer air grating is fixed at a higher level than the inner one, the traverse or drop opening being reversed. If desired, the volume of air can be regulated by providing a hit-and-miss ventilating grating on the inside, as shown in Fig. 17; but, generally, it is advisable that the admission of fresh air to stables should be as nearly as possible constant, the means of regulation of the air currents being confined within narrow limits. The inlet flue should be of sheet iron when built in hollow walls or rendered smooth in cement for solid walls, the external air grating being hinged in all cases, so as to provide means of access for cleaning the flue at any time. Fig. 18 shows a form of inlet ventilator known as a window-sill inlet; it is designed to admit the air in an upward, instead of a horizontal direction, but is more liable to become choked with dirt, hay-seeds, &c.

A fresh air flush inlet ventilator provided with baffle-plates is shown in Fig. 19. Air inlets of this description may also be obtained with or without regulating valve.

Fig. 20 is a section through what is known as the Tobin tube fresh air inlet ventilator. The advantage of this type of ventilator is that the air may be discharged in a vertical direction at any desired height within the building, whilst the external opening may be arranged near the ground level so that the maximum difference of level between the inlet of the fresh air and the outlet of the foul air is obtained. Although Fig. 20 shows the common form of the Tobin tube, yet it is very unsuitable for use in stables, owing to its projection from the wall. In stable construction nothing should be allowed to project beyond the face of the walls unless absolutely unavoidable, so as to minimise any risk of injury to the horses.

A modification of Tobin's tube inlet ventilator, which is suitable for stable buildings, is shown in Fig. 21; the external air grating should be hinged, so as to admit of the tube being periodically cleaned.

Another adaptation of the Tobin inlet tube, as made by a well-known firm of manufacturers (from a suggestion by Mr. Waterhouse, R.A.),

Fig. 23.

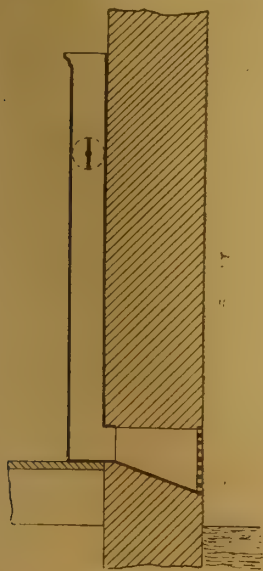


Fig. 20.

ventilation if required, and also to allow of the whole of the interior of the building being thoroughly flushed with air at any time.

#### INLET VENTILATORS.

Manufacturers of these appliances have from time to time introduced modifications in their general arrangement and design; but whatever the means adopted, the primary object to be performed by all inlet ventilators is the admission of cold air into a building without creating an objectionable draught. Essentially, this is effected in a somewhat similar manner in all of them—that is, by the construction of a traverse or turning

louvres can be obtained either fixed or hinged according to requirements.

Generally, however, the velocity of the incoming fresh air is broken by means of a traverse within the flue, or by an arrangement of one or more baffle-plates. A simple form of fresh

is shown in Figs. 22 and 23; it is eminently suitable for admitting fresh air at the head of each stall, and is known as a ventilating stall division. As will be seen from the plan and elevation given, the portion of the stall division near the wall is made in the form of an elongated tube. The

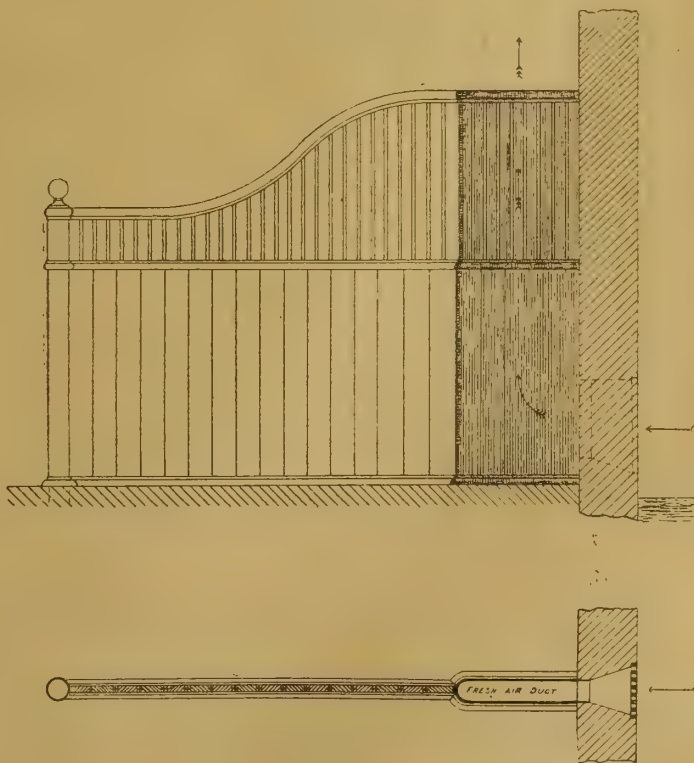


Fig. 22.





FIG. 24.

fresh air is admitted near the bottom through an external air grating, and discharged into the building in a vertical direction at the top of the division; if desired, the quantity of air admitted may be controlled by means of a regulator within the tube.

Stables are sometimes ventilated by means of what are known as ventilating heel-posts, as shown in Fig. 24. The defect of this method of ventilation is the comparatively great length of inlet shaft, and the consequent retardation of the air current owing to excessive friction, whilst the air-way of the shaft is liable to be blocked with accumulations of dust, hay-seeds, &c., which cannot be conveniently removed. Where the ventilation is carried out in this manner the renewal of the air within the building is, as a rule, not so thoroughly effected as in the case of well-distributed wall inlet ventilators.

#### THE WORK OF THE WORKS COMMITTEE.

**T**HE special committee of the London County Council appointed to inquire into the management and financial condition of the Works Department held another meeting on Friday afternoon at the County Hall, Spring-gardens. Mr. E. Waterhouse and Mr. E. A. Gruning, F.R.I.B.A., sat as assessors.

Mr. H. R. Taylor, an alderman of the Council, gave further evidence. In answer to Mr. Gruning, he said that there was great objection to the trade union clauses being taken out of the contracts made between the Council and contractors. If they were taken out it would mean that contractors would be able to employ inferior labour at inferior prices, and the Council would not be able to interfere. Under the labour clauses at present put in the Council's contracts, there was no need for strikes and disputes as to wages. Although there might be a general strike outside, it did not follow that the men employed by the Council would be implicated. The success of the Works Department chiefly lay in the superiority of the work done. In many instances the public had gained by the cost of some of the housing schemes being considerably reduced by the architect's department gathering information from the criticisms and action of the Works Committee. By Mr. Dickinson: There were about 120,000 men employed in the various branches of the building trade in London. The Works Department now employed about 2,000 men. The system now adopted by the Council for carrying out jobbing work was advantageous to the public. By Dr. Collins: He was opposed to the system of open tendering. By Mr. Fletcher: He doubted whether local jobbing works could be better done by local jobbing contractors than by the Works Department. He agreed with Mr. Ward, the chairman of the Works Committee, that if the department had been working with a sympathetic architect it might have saved 5 per cent. By Mr. Davies: As a workman, his impression was that the visits of members of the Works Committee to works in progress had a very beneficial effect. By Mr. Beachcroft: He drew a salary from the funds of the Bricklayers'

Union. In his own calling 90 per cent. of the men were members of trade unions. Mr. H. Holloway, president of the Master Builders' Association, was next called. He said he was a member of the firm of Holloway Brothers, building contractors. There was no such thing as a ring of contractors in London against the Council. The contractors, however, objected to some of the conditions of contract, and unless those conditions were modified he did not think the Council would get the first-class contractors to contract for its work. They objected to the words of the wages clause compelling the contractor to pay the full current rate of wages "obtained by the trade unions of the London district." He did not object to the "current rate of wages" being inserted. The contractors also objected to being compelled to disclose their books to the officials of the Council. He thought inspection of the time-sheets and wages-books would be sufficient; examination of the contractors' other books was unnecessary and offensive. He objected to the system of open tenders, preferring that of select tendering. Contractors would not care to be put into competition in tendering with the Works Department of the Council. If the Council had an honest desire to get tenders from responsible contractors they should, as near as possible, adopt the form of contract which had been agreed to between the Royal Institute of British Architects and the Institute of Builders. He considered that the work of responsible contractors was of quite as good quality as that done by the Works Department. He could see no advantage to the workman obtained from the Works Department which he did not obtain from respectable contractors. The Chairman: Then if the Council has made conditions which no contractors will accept, a works department becomes a necessity? My point is that it is only these conditions which are keeping contractors out, and that they are not essential to good work being done for the Council. I think these conditions should be abrogated. By Sir G. Lushington: In putting the words "rate of wages obtained by trade unions in the London district" in the contracts the Council was really making itself an engine for enforcing the policy of trade unions, and was placing itself in antagonism to contractors. By Dr. Longstaff: The system of open tendering was a fad of public bodies. It was diminishing at the present time, because these bodies were getting wise from experience, and were adopting a system of select tendering. The trade union system was good for young men, but hard and cruel to older men. He honestly believed that the objectionable conditions of the tenders for the superstructure of Bexley Heath Asylum were inserted to prevent responsible contractors from tendering. It was his deliberate opinion that the labour clauses in the contracts were passed for the direct purpose of preventing contractors tendering for the Council's work. By Mr. Beachcroft: In the £60,000 worth of work his firm had done for the Council they had certainly made a profit of more than 1½ per cent. It was impossible for any committee of a public body to successfully compete with his firm. By Mr. Davies: He was not against municipal work; but architectural work

could not be done so well by a municipality as by a building contractor. By Mr. Fletcher: It was unfair to the workmen of London for the Council to attempt to do its work all over London with 2,000 men employed at the centre. It might give rise to the creation of a privileged class of workmen. By Dr. Collins: Alterations had been made by the Council in the conditions of contract at the express request of the master builders. The Council in its terms of contract had all along done everything to protect the workmen, and not the contractors. By Mr. Dickinson: He should think that in London there were quite 100 "respectable" contractors who might be put upon a list, and from that list the Council should, from time to time, choose firms to contract for its work.

At the conclusion of the examination of the witness, the committee adjourned until Wednesday, when Mr. J. Mowlem Burt, of the firm of Messrs. Mowlem and Co., contractors, gave evidence. He said his firm had done a great deal of work for the Council. He had no objection to the rates of wages being set out in the schedule to the Council's contracts; but he thought that in any variations in wages during the execution of a contract, the sum paid under the contract should be proportionately enhanced or reduced. He suggested that the wages clause should read simply that the wages paid should be those agreed upon between the masters and the men. He objected to the words of the contracts, "in practice obtained by the trade unions." He did not think trade unions should be the arbiters of the wages. He also objected to the penalty clauses of the Council's contracts, since they gave the impression that the Council regarded all contractors as men who were not to be trusted. His firm had never been harshly dealt with by the Council. The clause in the contracts compelling the contractor to submit his books for inspection if so desired was very vexatious. He thought it would be sufficient for the Council to inspect the wages and time-sheets. His firm had not ceased to tender, but they could not accept contracts under the present conditions. In the tenders they had sent in they had struck out the objectionable clauses. His firm would not object to tender in competition with the Works Department, at least, until they found it was useless. By that he meant that a time might come when they found the Works Department made a very low offer, and then came to the Council for more money. His firm, being general contractors, hardly saw the same objection to the arbitration clause that builders in the strict sense of the term would see. They were generally willing for an engineer to be the sole arbitrator; but they should certainly object to the architect being the sole arbitrator. He thought the system of select tendering as adopted by the London School Board a good one. Mr. Rowland Plumbé, F.R.I.B.A., who has acted as architect for the erection of some of the Council's artisans' dwellings in connection with the Shelton-street and Boundary-street schemes, said that the work executed by the Works Department was as good as that executed by ordinary contractors. He was unable to see any difference in the amount of work done by the men for contractors and that done for the department. The supervision of the work was as effective in the case of the department as in work carried out by contractors. He thought it would be best for the Council to put out to contract the highly-technical building work. Sewer work might well be carried out by the Council, for in that class of work contractors usually made large provision for risk.

The proceedings were adjourned.

#### THE COST OF BOARD SCHOOL BUILDINGS.

**A** SPECIAL sub-committee of the Works Department of the London School Board, appointed to inquire into the cost of the schools erected by the Board, for the purpose of ascertaining whether any reduction of expense could be made, have just presented their report. The cost of building ran up considerably between 1885 and 1895—the cost per head on main school buildings, including halls and drawing-classrooms, being from £10 13s. to £15 15s. 9d. in the latter year, as compared with £7 0s. 1d. to £9 1s. 11d. in the former. In a report made to the sub-committee, the architect of the Board, Mr. T. J. Bailey, suggests that the standard of building,



which was appreciably raised in 1888, as the result of the recommendations of a special committee, is almost beyond the necessities of the case. The object to be gained is to find a satisfactory mean between the two extremes of inferior building and of luxuriously-expensive workmanship. The question of sanitation has of late years come prominently to the front, and the exactions of the local sanitary authorities have tended to enhance considerably the cost of public buildings, while the new London Building Act of 1894 involves additional expense. The architect suggests that, with a view to reducing expense, the general standard of ten years ago should be reverted to, "which would only mean the abandonment of the little luxuries added from time to time." In another part of the sub-committee's report, the general advance in the cost of building between 1885 and now is assessed at from  $7\frac{1}{2}$  to 10 per cent. The great advance in London during the past year is said to be due to the state of the labour market, the results of the various trade disputes being evident and undeniable. The risks which contractors run in this direction have caused a general advance in rates to meet contingencies. After considering the views expressed by their officers, the sub-committee recommend the Board to revert to the old specification in force in 1885-86 for all future schools and enlargements, subject to such modifications as the architect may think it necessary to make in order to bring the specification up to the present requirements of the Board and the Education Department. There are also various recommendations with reference to the materials used and the method of using them, the object being to reduce the cost of school buildings.

#### CLERKS OF WORKS' ASSOCIATION.

THE fourteenth annual dinner of the Clerks of Works' Association took place at the King's Hall, Holborn Restaurant, on Monday night. Mr. Beresford Pite, F.R.I.B.A., President of the Architectural Association, occupied the chair, and was supported by a numerous company, including Professor T. Roger Smith, Messrs. H. D. Searles-Wood, W. H. Seth-Smith, Stanton W. Pierson, T. B. Whinney, J. E. Drower, W. S. Woolacott (president), P. J. King (vice-president), F. Dashwood (secretary), &c. The toast of "The Army, Navy, and Reserve Forces" was proposed by the chairman, and was felicitously acknowledged by Col.-Sergeant J. Aitchison. Mr. J. Brady, editor of the *Clerks of Works' Association Journal*, in proposing the healths of "The Architects and Surveyors" (represented at the gathering by over a score members of the profession), alluded to the mutual aid afforded to the architectural profession by the register of examined and competent clerks of works, and to the association by the support received from those in practice. He coupled with the toast the names of Professor T. Roger Smith and Mr. J. E. Drower. In responding, Professor Roger Smith said he was glad to be able to express the feeling of gratitude architects felt for the assistance rendered them by clerks of works in carrying out their ideas. It was an interesting calculation how many men's brains were exercised over the erection of a single big building—the designer, quantity surveyor, contractor, suppliers of materials from many parts of the world, and then, when the actual work of erection was commenced, the clerk of works was called in, and bore a very large share of the responsibility and toil of seeing the undertaking carried out—he was eyes and ears to the designer on the structure in watching every stage of its erection. He (the speaker) was now old enough to admit that the clerk of works knew more about many practical matters on a building than he could do, for he had necessarily had a different training to the architect, and so could help him immensely. He would suggest that while the clerk of works was expected to obtain the best possible materials and workmanship within the limits of the contract, he should be careful to keep within those limits, for the whole matter had doubtless been fought over and threshed out long previously to the advent of the clerk of works by the building owner and his architect. In another way a clerk of works could act advantageously to the interests of all concerned: he could look ahead, and note what matters would next need attention, and which should be ordered. So far from deteriorating, the standard of ability and

knowledge was being raised, as was shown at the examinations conducted at Carpenters' Hall, and he had reason to believe that the men who were now being added to the ranks of clerks of works were fully as trustworthy and well informed as the men already engaged in these duties, and he was confident they would long be able to say, as now, that the architect's best friend on a job was the clerk of works. Mr. Drower also replied, speaking from the standpoint of a surveyor. Mr. F. Dashwood, in a humorous and anecdotal speech, proposed the toast of "The Worshipful Company of Carpenters," referring to the hospitality the Company had shown to the Association in granting the use of their hall for meetings and examinations, and to the munificent manner in which the Company was promoting technical education at their Great Titchfield-street and Stratford institutions. After an examination of these schools, he had, he said, come to the conclusion that they more than compensated for the abandonment of the apprenticeship system, as they afforded practical and varied training of a character that could not be acquired in any but the largest and best-managed establishments. He hoped no amateurs would be admitted to the classes. Mr. Stanton W. Preston, the clerk of the Carpenters' Company, in acknowledging the toast, stated that there were 233 students in the Company's schools at Great Titchfield-street, and between 200 and 300 boys and men in their institution at Stratford. They did not propose to admit amateurs to their classes. He expressed his indebtedness to Mr. Dashwood and the successive presidents of the Association for the ready help they afforded in conducting the examinations and exhibitions. The Chairman, in proposing the toast of the evening, "Success and Prosperity to the Clerks of Works' Association," remarked that he had known the Association since its foundation. He pleaded with those clerks of works at present outside to join its ranks, and referred to the benefits of association to men so isolated in the discharge of their duties as clerks of works. The clerk of works occupied a very difficult position, and brought to his duty those qualities of fact, rectitude, knowledge, experience, and quick decision which made him, as a class, respected and trustworthy. With the toast he coupled the name of the president, Mr. Woolacott, who in replying said it was the aim and endeavour of the members to come up to the high ideal the chairman had suggested—indeed, it occurred to him that such a responsible position demanding so high a character ought to be better remunerated than was now the case. At their last dinner he called attention to the fact that the London County Council paid their clerks of works less than many artisans obtained. He was glad to say that the council had since increased the rate from three to three-and-a-half guineas weekly, and if they made it four guineas it would be only reasonable recompense for such harassing work. The remaining toasts were "The Visitors," proposed by Mr. E. W. Nightingale, and acknowledged by Mr. T. B. Whinney; "The Press," given by Mr. J. G. Peacock, and responded to by Mr. W. T. Plume; "The Hon. Treasurer," proposed by Mr. King, vice-president, and acknowledged for Mr. J. Oldrid Scott by Mr. J. Spooner; and "The Chairman," proposed by Mr. J. Plowman.

#### LONDON DWELLINGS.

"LONDON DWELLING HOUSES" formed the subject of an address given at the London Institute, on the 4th inst., by Dr. Poore. The typical London house was, he pointed out, built in the form of a tower of five stories, one being below ground. This style of construction might be necessary in such a crowded city; but it had many inconveniences and dangers. The strain of going up and down stairs was objectionable: there was neither sufficient light nor ventilation, and the underground floor was not in accordance with civilisation. Even in the houses of the wealthy a servant was often relegated to the pantry as a sleeping place. Plumbing was frequently carried on to excess, and the modern architect had an extraordinary partiality for trap gullies, which only served to collect decaying matter. The isolated building was the thing to strive after, and one of the defects of modern times was to overcrowd houses. Directly a district was sewered and had the water laid on it was marked out as an admirable building

estate. As soon as the estate was thoroughly built upon an infectious hospital for the reception of cases therefrom was a necessity. The mortality figures of the Strand equalled those of a Lancashire manufacturing town, and this was mainly due to the overcrowding. So-called "lungs" were of little value if the blood only circulated there on Sundays. No amount of open spaces would compensate for the absence of light and air around the dwelling—where they ought to be. If the wealthy in London were going into flats, what must the poor be doing? It was very difficult to prevent overcrowding. The Commonwealth passed a law to the effect that no house should be built within ten miles of London which had not four acres of land; but such a regulation was impossible now. Still people might be encouraged not to overcrowd. At present, although the methods of treating sewage were most of them abominably erroneous, anyone who tried common-sense improvements was likely to get into trouble. Nevertheless isolated houses might be kept in a perfect state of sanitation without the local authorities ever being troubled for their services.

#### PLUMBING SIMPLIFIED.

MR. WM. PAUL GERHARD, C.E., consulting engineer, New York, has written a sensible little brochure under this title. He observes that modern plumbing work, as carried out in the States, and as required by the rules of health in building departments, is open to the objection that it is unduly complicated and costly. The "trap venting law" in New York, Boston, and other places requires that all traps must have a "vent-pipe connected at, or near the crown of trap, and extended either separately up to the roof, or connected with the soil-pipe line above the highest fixture." This rule has been followed generally, in both large and small cities. Mr. Gerhard, who is an acknowledged authority on the subject of sanitary matters, says the branch-trap ventilation is carried too far, that it creates new and serious dangers, and is costly. He makes the following objections: That the venting of traps leads to a dangerous complication, it involves a useless outlay, it often doubles the number of pipe joints in a building, and increases the danger of leakage at the joints; that trap vents attached to the "horns" of porcelain fixtures often lead in case of settlement of the building to the breakage of these horns, thus opening up a dangerous inlet for sewer air; the mouth of the vent-pipe, where it is joined to the crown of trap, is liable to clog up with deposit, and the upper end of the back air-pipe, where it reaches the roof, is liable, unless enlarged to at least 4 in. diameter, to be closed up with snow; that the increased air current destroys the water seal of the trap, and the friction of the air, owing to the bends in a long vent-pipe, defeats its own purpose. He observes that the branch waste-pipes can be well aerated and flushed if the fixtures are located immediately adjoining well-ventilated soil or waste-pipe lines. The diagrams and sections given illustrate the author's simplified method. In one section of a two-story building he shows the soil-pipe carried up its full size through the roof, with fresh-air inlet at foot of pipe, showing the 4 in. branch connections from fixtures, wash-basins, baths, sinks, &c. No back air-pipes are shown. The closets have S-traps, with a depth of water seal to secure it against siphonage. In the second example, the author shows a group of lavatories on several floors. The pipe line is a vertical waste-pipe, having on each floor a 2 in. Y-branch to receive the wastes from wash-basins. These branch wastes are 2 in. in diameter. Each basin waste is trapped by a 1½ in. non-siphoning trap, and the branch waste does not form a dead end at its upper part, but is continued by a pipe of the same size to a vertical straight vent-line 2 in. diam. up to roof next to outer wall, enlarged at top end to 4 in. This vertical pipe-line aerates all the branch waste-pipes. Siphonage by this means is impossible, as there is no vacuum formed anywhere. In another diagram the arrangement of a row of fixtures, two closets, basin, and bath are shown. One 5 in. soil vent-pipe laid to a slight fall below the floor takes all the waste-pipes from closets and bath to a 5 in. soil-pipe in a recess in outer wall which is carried up to roof, while the upper end of soil vent has a branch vent of same size into another vertical 5 in. vent-pipe line against an inner partition. The pipes are continued the full size.



The basin and bath wastes have each a separate 5in. by 2in. Y-branch, and then it is continued above the overflow point of these fixtures, and connects with a 5in. vent-pipe. No branch venting is used, and the arrangement simplified greatly. Mr. Gerhard's system is certainly worth the attention of all plumbers and sanitary authorities, especially those in the States. The system as shown avoids siphonage, as air follows the discharge action in all the pipes, and the avoidance of the back air-pipe, with all its attendant joints and complications, much simplifies the arrangement. Many of the imperfect systems in use are owing to the following of rules which were well intended at the outset, but which are not applicable to ordinary cases. The small soil-pipes, long branch pipes without an independent outlet, dead ends, are the sources of much trouble; and the author has, by simply giving each pipe a free current of air through it, and by connecting the branch pipes with the vertical lines of soil or waste of the same size, shown how a building may be effectually drained. The book is worth attention by the authorities and by the profession generally, and those who desire to simplify existing sanitary construction.

#### THE SURVEYORS' INSTITUTION.

At the meeting of this society held at Savoy-street, on Monday evening last, a paper was read by Mr. W. J. Willis Bund (barrister-at-law) on "Allotments and Small Holdings." The author began by saying that, although the present law on the subject was only some ten years old, it seemed to require recasting, for, since the passing of the Local Government Act of 1894, there was a duplication of conditions, of authorities, and of rules, which tended to confusion, and was opposed to that economy and efficiency which were so essential to the useful working of any Act dealing with allotments. Then the question arose: For whom are allotments to be provided? Are they to be for the labouring poor of purely agricultural districts, or for anyone who fancies he would like to have a piece of land as a convenience to supplement his perhaps small garden? This should be more clearly defined. Different rents would be fair in the case of a man who has to make a living from his holding and in that of a man who merely wants some accommodation ground as a convenience, or even as a means of recreation. If allotments are to be provided for whoever wants them, then parishes near towns are liable to be called upon to provide them for persons outside their boundaries. It seemed, he thought, hard that the ratepayers should be called upon to provide land for everyone who wanted a small piece, no matter for what purpose. The question of rent was a difficult one. It had been so much impressed upon the labourers that they had a right to demand land, that they had come to think they must have it at whatever rent they liked to pay. Instances had arisen where a large holding was let for, say, 40s. an acre, and the labourers felt themselves much aggrieved because they could not have a small portion of the very best of it at perhaps 30s. It was obviously unfair to expect to get the pick of the whole at the average price, whether it were good, bad, or indifferent, whether it were near the homestead or not, whether it had a building value, or whether its loss, as arable or grass land, would seriously affect the rest of the holding, or even render it unlettable. Then there seemed no security that the allottee would properly cultivate his holding and leave it in proper condition, or against his working one plot to its utmost and then taking another in its place. He took everything from the land, and was not bound to put anything back at all. Then the costs of acquiring the land by the local authority and the interest on the sinking fund necessary to pay for the land must be taken into consideration in fixing the rent. When these and the allowance for some of the allotments being vacant were added to the ordinary rent, it would seem that at least a sum of 10s. a year must be added. Again, a very large proportion of the land was for various reasons quite unsuitable for allotments, and in cases where an owner is unwilling to let his land for the purpose, the cost of the exercise of compulsory powers under the Act meant something like another 10s. an acre on the rent. All these difficulties made it impossible in many cases to let the land at such a rent as the general agricultural labourer could afford to give.

In the case of mere accommodation land it was, of course, different. In the case of small pasture allotments, the old "Three Acres and a Cow"—where fences were required, the expense of these was prohibitive in many instances. Whether the rent should be paid in advance—which would be hard on the tenants; or at the end of each given term—which is risky to the ratepayers—was a difficult point to decide. The small possible loss might not be worth the friction if the former method were adopted. There seemed to be a very real demand in some districts for land in small plots to be cultivated by labourers and persons above that class; but that demand did not seem to exist largely in the case of the agricultural labourer, for whose benefit the Acts dealing with the matter were presumably passed.

A discussion followed, in which Messrs. Buck, Langridge, Rolleston, Eggar, Vernon, Scriven, Moore, and Redman took part.

#### BUILDING TRADES EXHIBITION.

##### MEETING OF CONSULTATIVE COUNCIL.

A MEETING of the Consultative Council of the above exhibition was held at the offices, 43, Essex-street, Strand, W.C., on Friday, the 5th inst., Prof. Banister Fletcher, J.P., F.R.I.B.A., presiding. There were present: Lewis Angell, C.E., F.R.I.B.A., Chas. Barry, F.S.A., F.R.I.B.A., G. M. Callender, H. Phillips Fletcher, A.R.I.B.A. (Hon. Secretary), A. J. Gale, F.R.I.B.A., F. T. W. Goldsmith, A.R.I.B.A., P. N. Hasluck (*Building World*), E. J. Kibblewhite (*The Building News*), Ellis Marsland, H. Greville Montgomery (Manager), W. G. Penty, F.R.I.B.A. (York), H. Riches, John P. Seddon, F.R.I.B.A., Edwin O. Sachs, A.R.I.B.A., A. H. Ryan Tenison, A.R.I.B.A., E. W. Thornton, A.R.I.B.A., W. Seckham Witherington, F.R.I.B.A., Gilbert Wood (*The Architect*).

Letters of apology for non-attendance were read from: John Belcher, F.R.I.B.A., R. Wilkie Edis, F.R.I.B.A., H. Huntly Gordon, F.R.I.B.A., Hy. Hall, F.R.I.B.A., T. E. Liddard James, F.R.I.B.A., Edwin Seward, F.R.I.B.A., (Cardiff), Walter Emden, W. Hampden Pratt, F.R.I.B.A., H. H. Collins, F.R.I.B.A.

The minutes of the previous meeting were read and confirmed, and the following report was read as to the prizes promised in connection with the handicraft competitions:—The Tylers' and Bricklayers' Company, the Worshipful Company of Carpenters, the *Building News*, the *Building World*, the *English Mechanic*, H. Greville Montgomery.

It was agreed to ask architects and others for the loan of drawings and models of buildings, and it was decided to hold conferences during the exhibition in the different sections of the building trades.

It was suggested that various associations connected with the trade be invited formally to the exhibition during the time it is in progress.

The designs for the poster on view at the offices, for which a premium of £10 was offered, created a lively amount of interest to those present, and an informal plebiscite of the best design was taken.

Various other business was gone into, and it was agreed to hold the next meeting of the council at the Royal Agricultural Hall just previous to the opening of the exhibition.

#### THE DESIGNS OF JOHN TIJOU.\*

A FACSIMILE reproduction of "A new Book of Drawings, invented and designed by John Tijou," has been published by Mr. B. T. Batsford, prefixed to which is an account of the author and his works, and descriptions of the ironwork designs, by J. Starkie Gardner. This work is a rare and remarkable collection of designs for ironwork, which was published by the author in London, in the year 1693. We learn that the only extant copy of the original work was offered for sale some years ago, and belonged to the Duke of Beaufort, and was priced at £48 by Mr. Bernard Quaritch, the well-known bookseller. The reproduction of the present facsimile plates have been very carefully executed, and compare in brilliancy with the original copper-plate engravings. The descriptive text has been written by Mr. Starkie Gardner, whose interesting notice of Tijou and his colleague, Huntingdon Shaw, is a valuable

addition to the original designs. Mr. Gardner remarks that these designs for ironwork "form the most sumptuous illustration of the art of the blacksmith ever produced in this country." When published in 1693 the book exerted an extraordinary influence, and almost revolutionised the art of ironwork in England. Before its appearance mediæval traditions and treatment predominated. Tijou's style was imitated, and can be traced through the 18th century. During the reigns of William, Mary, and Anne the style which Tijou introduced became prevalent, and the work of the author at Hampton Court, Chatsworth, and Burleigh, is illustrated in this fine volume. The original plates are all signed by Tijou as designer and executant, and are engraved in the best style. Referring to the Hampton Court ironwork, Mr. Gardner alludes to the popular notion that prevailed amongst compilers of guide-books, which ascribed to Huntingdon Shaw the design and execution of these celebrated examples. Shaw was a smith of Nottingham who was buried at Hampton in 1710, and an inscription on his monument concludes with the words "he designed and executed the ornamental ironwork at Hampton Court Palace." This concluding sentence, it appears, was added when the tablet was scraped and refixed inside the church after its rebuilding, and is not the same ending as the old inscription. Be this as it may, there is little doubt, as Mr. Gardner says, that Shaw was probably a reliable foreman of the great smithcraftsman, and assisted Tijou in his work. The inscription of the tablet, written 120 years after Shaw's death, only embodies a tradition that has been proved to be ill-founded.

The plates contain an interesting, classically-conceived frontispiece, by Louis Laguerre, Tijou's son-in-law and pupil of Verrio, ornaments for the Hampton Court screen, which is a magnificent piece of design and smithcraft; the centre gates in garden front, with monogram "J. T." centre gates surmounted by earl's coronet under laurel boughs, and wickets, a rich stair balustrade for Chatsworth with the arms of the Duke of Devonshire when Earl of Cavendish, several enriched panels and balustrades, gates to the courtyard at Burleigh, rich escutcheon and key-bow stair balusters for library of Trinity College, Cambridge; gates in Long Walk, Hampton Court, and the well-known screen. The existing design, in parts such as the pilasters, show modifications. As a valuable contribution to the art of the blacksmith, this reproduction of the designs of one of its most illustrious modern craftsmen, deserves a place in all architects' and art-craftsmen's libraries.

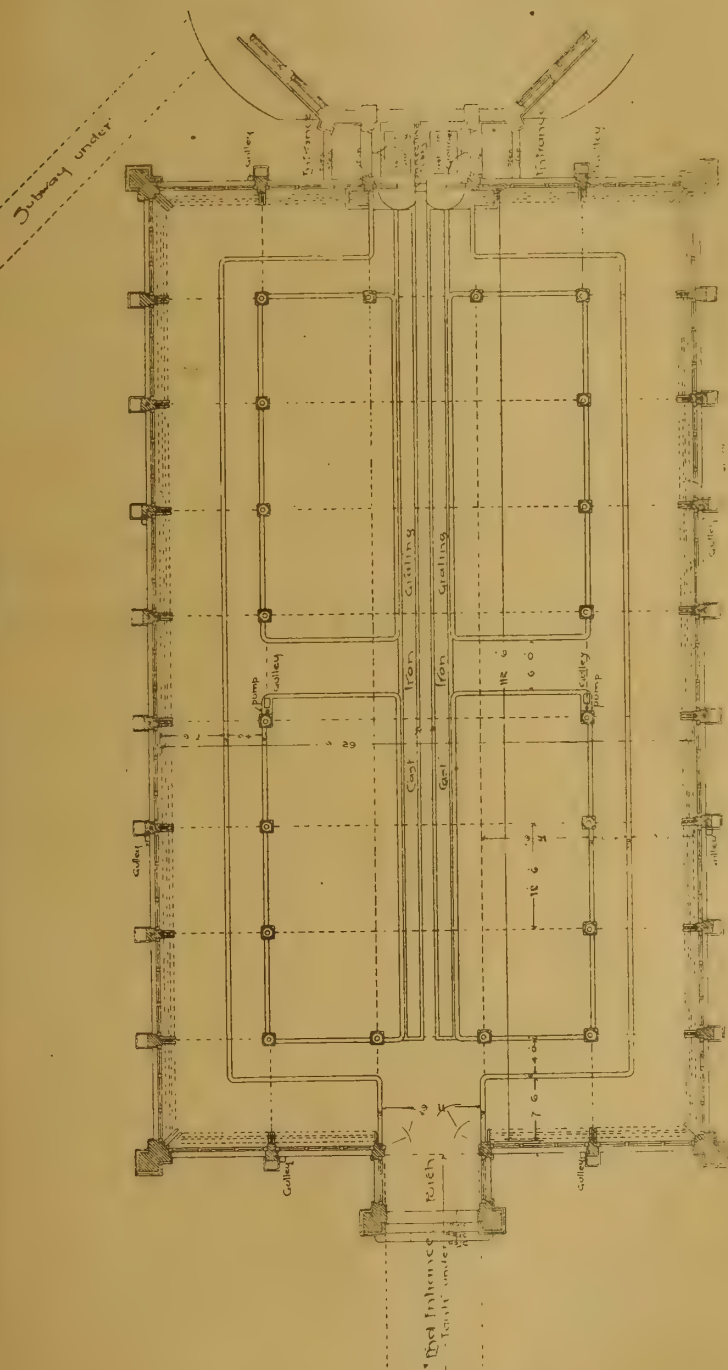
#### THE NEW TEMPERATE HOUSE, KEW GARDENS.

THE original main or central building was erected from the designs of the late Decimus Burton, by Messrs. Cubitt and Co., in the year 1806. The complete scheme at this date comprised the large middle building known as the Temperate House, and two wings connected to the main structure by intermediate houses or octagons. Owing to financial exigencies, the construction of the two smaller houses forming the wings, included in the original design, was postponed indefinitely, and it was not until the year 1895 that the Government decided to complete the scheme. The south wing, which we illustrate, has just been completed, and is now being stocked with plants. The erection of the north wing will be commenced this year. As regards its external features, the new building follows the general design of Mr. Decimus Burton's central structure; but the construction has been modernised as far as might be; there is a great gain in the lighting as compared with the main structure, and the solid arcade of brickwork has been omitted. A novel feature in the glazing is the introduction of a new type of copper cap upon a wooden bar. This is one of the latest patents of Messrs. W. E. Rendle and Co., of 5, Victoria-street, Westminster, and it has previously been used with great success upon an earlier building in the Gardens. The contractor for the south wing was Mr. D. Charteris, of Page-street, Westminster, and the work generally was designed by Mr. E. G. Rivers, of H.M. Office of Works. The building is formed, as will be seen from the drawings, by an iron arcaded nave with aisles, and the timber roof is carried above iron ribs spanning the central area. When the palms and plants are in the open borders of the building, this new Temperate House will greatly add to the many attractions of these well-managed public



## : KEY · BOTANIC · GARDENS ·

NEW WINGS TO TEMPERATE HOUSE.



FINCH

... of 1.57

Section of Pier

TO DIVINE MEN,

Lehigh  
University



gardens. It is undoubtedly a great improvement upon the earlier house, speaking from the point of view of the grower, and it harmonises well architecturally with Decimus Burton's design, the necessity for which could not be ignored. A roof entirely of steel might possibly have been lighter, and some think more durable than wood. No little skill has been displayed in the design of the building, and its full illustration in detail in our pages cannot fail to be interesting to our readers. We shall continue our illustrations of the details next week.

#### OBITUARY.

COL. J. B. MOULTON, who died at St. Louis, Mo., January 21, was a prominent civil engineer. He had been engineer of the Chesapeake and Ohio Canal, built the Lexington and Frankfort Railroad, was for two terms county engineer of St. Louis, and later was city engineer at St. Louis, and for a number of years he was chief engineer of the Iron Mountain Road and the North Missouri, now the Wabash Road. He constructed the northern branch of the Wabash system in Iowa. He retired from active business ten years ago, but officiated occasionally as consulting engineer until quite recently.

#### CHIPS.

Mr. John Walter Wyles, F.S.I., was initiated into Freemasonry on Thursday, the 4th inst., at the Mornington Lodge, Holborn Viaduct Hotel, the ceremony being performed by the Worshipful Master, Bro. Henry Theobald, F.S.I.

The finance committee of the Bradford Corporation recommend the erection of municipal offices and an art gallery as the means of celebrating the Diamond Jubilee in the borough. The corporation possess some land and buildings in the rear of the town hall, and it is proposed that this site should be utilised for the purpose.

The memorial church built at Forest Green, near Dorking, by Mr. and Mrs. C. Ernest Hensley, of Pratham Grange, in memory of their eldest son, Mr. E. C. Evered Hensley, was dedicated to the service of God by the Bishop of Southampton on Saturday.

Several important schemes are announced for the further development of the Barry district. A company, named the South Wales Property and Building Company (Limited), with a capital of £10,000, has been formed to build a large number of new houses, principally cottage property, on a portion of the Mount Pleasant Estate close to the Barry No. 2 Dock. It is also contemplated to erect some scores of houses along the continuation of Jewel-street, between Holton-road and Barry Dock Station; and the Weston Hill Estate Company (Limited) has just been registered, with a capital of £6,000, to erect workmen's cottages and other property at Weston Hill, with an hotel, on a site near Weston Farm, Cadroxton.

The Clothworkers' Company recently granted an additional £15,000 for the purpose of extending the Textile and Dyeing Departments of the Yorkshire College, Leeds. Part of the sum has been expended on the purchase of ground adjoining these departments, and the remainder is to be devoted to building operations. The whole of the details have now been arranged, and the plans are being prepared by Messrs. A. Waterhouse and Son, the architects of the college. The works will be commenced as soon as practicable.

At the meeting on Saturday of the Birmingham Trades Council, the President, Mr. A. Keegan, drew attention to a matter relating to the reconstruction of the city surveyor's department. He said that out of the seven or eight officers who performed the functions of clerks of the works, only one had had a practical training in the building trade, and in the reconstruction he had been reconstructed out of the particular office which he formerly filled, and in which he was very useful to the working-class population. The president added that he knew many instances where the by-laws had never been carried out in the erection of small house property, and where the evils which existed would never have been permitted if the work had been under the supervision of a practical man. The matter was referred to the Building Committee to report on.

The Islington Vestry have been informed that a legacy of £250 has been bequeathed to them by J. T. Barber, late of Lincoln. The vestry clerk stated that J. T. Barber was a road foreman in the employment of the vestry. He retired under rather peculiar circumstances as to health. The vestry granted him a superannuation allowance of £33 3s. per annum. During the time he was superannuated he received £283 3s.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—At the meeting of this association held in Newcastle on Wednesday week, the chairman, Mr. F. W. Rich, brought before the members the question of the proposed restoration of Peterborough Cathedral. He said they had lately had a great deal of amateur criticism on the matter, and the more architects stood up against those innovations on the part of amateurs, the better it would be for themselves. He moved the following resolution:—"That the Northern Architectural Association, looking to the amount of public interest and criticism that has arisen respecting the proposed restoration of the cathedral of Peterborough, desires to convey to the Dean and Chapter their appreciation of the course pursued by them in upholding and carrying out the advice of their architects, Mr. J. L. Pearson and Sir Arthur Blomfield; and however much the Northern Architectural Association may regret the circumstances that necessitate the pulling down of part of the work, yet they feel assured that in the hands of such an experienced and able man as Mr. Pearson there will be nothing done without good cause." The resolution was seconded by Mr. Reay, and carried unanimously.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The monthly meeting of the members of the above society was held at the School of Art, Arundel-street, on Feb. 9, when Mr. John Slater, B.A., F.R.I.B.A., gave a lecture on the "Buildings of the Ancients." Mr. C. Hadfield, F.R.I.B.A., president, occupied the chair. Mr. Slater, at the outset, quoted the late Mr. Fergusson's remark that beauty in architecture consisted not so much in particular features as in appropriateness of design and elegance of detail. In the present century there had been many changes of style. Each successive period had found ugly and unsuitable what had been praised as fit and beautiful by its predecessor, thus showing the narrow-mindedness of those who posed as the directors of the public in matters of taste. The first builders who attained to any great architectural skill were the Egyptians, in whose history four periods stood out as those of great architectural activity. Crossing from Africa to Asia, different materials and methods of building were found, sun-dried and burnt bricks forming, in the absence of stone, the staple building materials. The third great building people of antiquity were the Persians, whose supremacy in Central Asia dated from about the 6th century B.C. The rocky plateau of Persepolis was the site of the most magnificent palaces of the kings, and the ruins still existed to testify to their grandeur. After alluding to recent discoveries in the district anciently called Phrygia, and to some curious examples of the exact imitation of wooden forms in stone, the lecturer concluded by saying: As the byways of the world become opened up to us, we are continually finding unexpected remains of building nations, and it is not too much to say that wherever upon the whole face of the earth explorers have come upon the relics in stone or brick of a remote civilisation, their wonder has been excited at the solidity, and in many cases the high artistic quality of the work. It appears to me that, despite all our modern resources and all the discoveries of science in these latter days, no one can study such buildings as I have brought to your notice this evening without having a little of his 19th-century conceit taken out of him; for truly all the remains testify that in energy and intelligence, and in skill, there must have been giants in those days. The paper was illustrated by a number of large diagrams prepared by Mr. Slater.

The Sheffield Town Council at their last meeting adopted, after a long discussion, the report on Tramways Traction by a committee, recommending the choice of the overhead electric system. It was decided to make a beginning on the Nether Edge and Attercliffe routes.

The town council of Bury, Lancs, ratified on Friday the resolution retaining the services of Mr. J. Cartwright, borough engineer, who has applied for a position at Sheffield. They agreed to pay £750 for his services in constructing the reservoir and sewage works, granted him a limited private practice, and consented to his retaining his present position for two years at least at £600 per annum, and then to be consulting engineer for three years at £250 per annum.

#### Building Intelligence.

**COLCHESTER.**—At the quarterly meeting of the town council of Colchester, the special municipal offices committee presented the reports of Mr. Brightwen Binyon and Mr. E. W. Mountford on the town-hall question, and recommended that, having regard to the advice of the architects, that the council have a new town-hall erected on the site of the existing one and adjoining properties, and that temporary municipal offices be provided. The report was adopted, an amendment proposing to invite competitive plans from architects and to offer premiums of £75 and £25 for the best designs for new municipal offices and the adaptation of the existing town-hall being rejected by 15 votes to 10.

**KIRKCALDY.**—At a meeting of Kirkcaldy Town Council on Monday evening a report by a committee was read recommending the authority to adopt the plans of Messrs. Campbell, Douglas, and Morrison, Glasgow, for a new infectious diseases hospital to be built at Smeaton, which were approved by the Local Government Board, with the exception that the new hospital should accommodate ten more beds—namely, thirty-three, the total cost to be £9,200, or £277 4s. 1d. per bed, the architects coming under an obligation to forego one-half of their commission if the sum estimated is exceeded, excluding, of course, any extras or other work recommended by the authority during the erection of the hospital. The recommendations were unanimously agreed to.

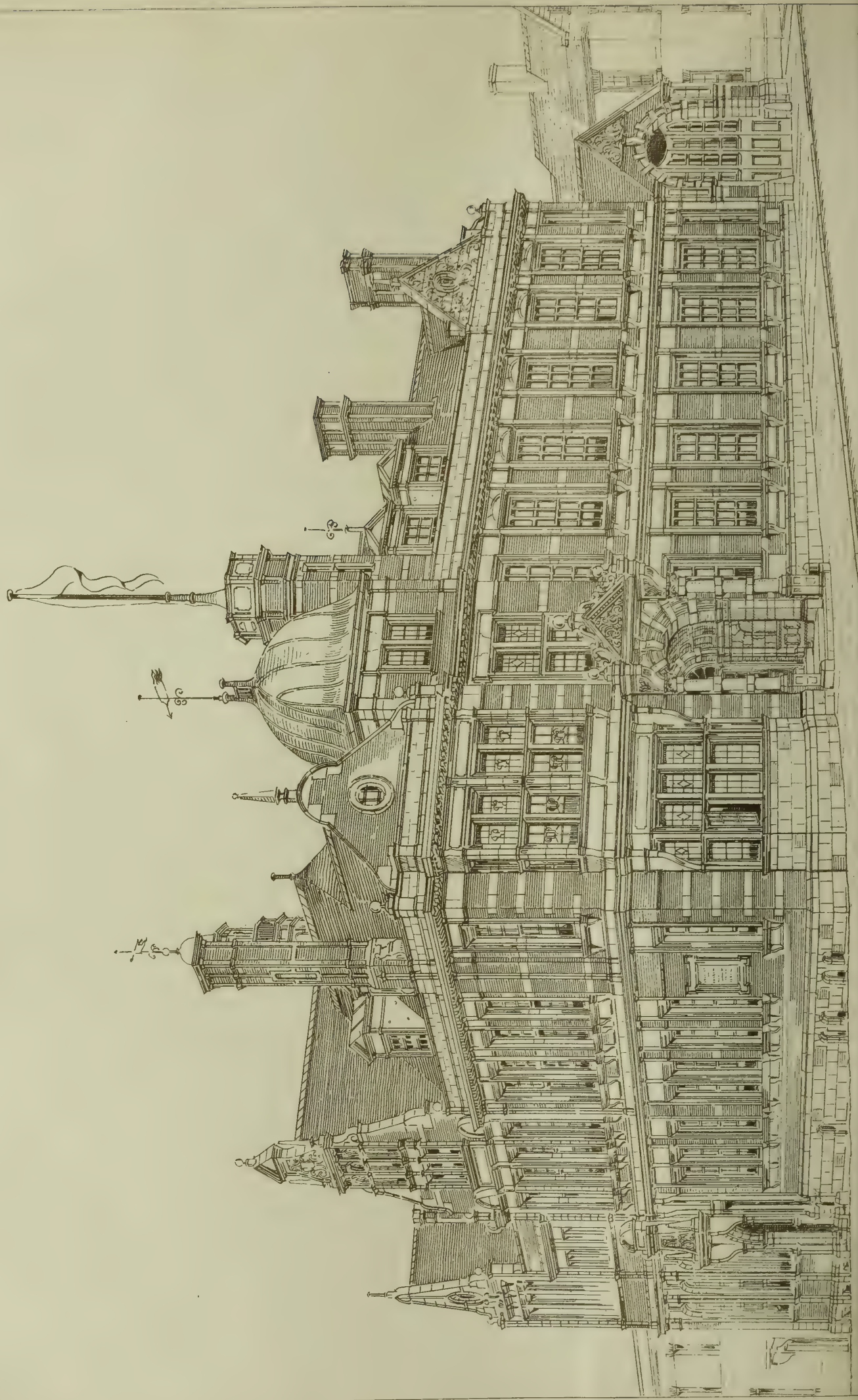
**WARWICK.**—The Earl of Warwick presided over a public meeting, held in the Court-house, Warwick, on Friday, to take steps for raising the amount necessary to complete the restoration of St. Mary's Church in that town. The report of the Restoration Committee stated: "The cost of this work has been considerably more than was anticipated. For the repair and restoration of the church and tower £13,637 4s. 9d. have been since 1884 contributed and expended. But an additional sum of £2,550 is still required to discharge liabilities already incurred and complete the work. The total amount is not large when the size of the church, the height of the tower, and the extensive repairs required are taken into consideration. The first architect consulted reported that the cost would be about £21,000." Various contributions were announced, amounting to £350. Mr. R. C. Heath explained that when they commenced the work more than twelve years ago, they decided to restore the exterior of the church first, and this involved an expenditure of £5,000 for the tower alone. In 1894 they undertook the interior, and decided to pull down the galleries, remove the organ, and alter a portion of the seating. They found, as they proceeded, that it was necessary to provide a new floor and replace the high pews in the nave by modern seats. They had, therefore, exceeded their estimate, and were, for the first time since they entered upon the restoration, in debt. It was decided to make efforts to raise £2,500 to complete the works.

**WINCHESTER.**—The repair of the great timber roof of the Cathedral nave is now completed, and has occupied the workmen of Mr. John Thompson, J.P., of Peterborough, under the direction of Mr. Russell, less than a year, having been commenced last April. The staff included forty men, and they have put on three new great beams across the nave, made good all rafters, purlines, &c., consuming therein 9,000c.ft. of new oak. The old roof had by decay here and there sunk, and rested on and unduly pressed the vaulting of the nave. This has been rectified by cambering, and the new timber is some inches clear of the groining. The temporary and movable roof and tarpaulins will be re-erected over the north transept preparatory to repairs to lead, &c. The timbers of the roof of the south aisle of the presbytery, or retro-choir, are to be attended to, and none too soon, for here De Lucy's work has for many years been out of the perpendicular, consequent on defective foundations in the watery subsoil, and the result has been to draw the beams from the wall-plate and corbels, two of which are broken off; it is, indeed, strange the roof has not fallen and damaged the vaulting of De Lucy's fine and Early English work, the product of a confraternity of craftsmen during his episcopate (1189-1204). Mr. W. P. Moreton, of Winchester, has done all the recasting of lead for the roof.















HOUSE AT ROCHDALE SW VIEW  
MESSRS BUTTERWORTH & DUNCAN ARCHTS



Ground Floor



First Floor Plan



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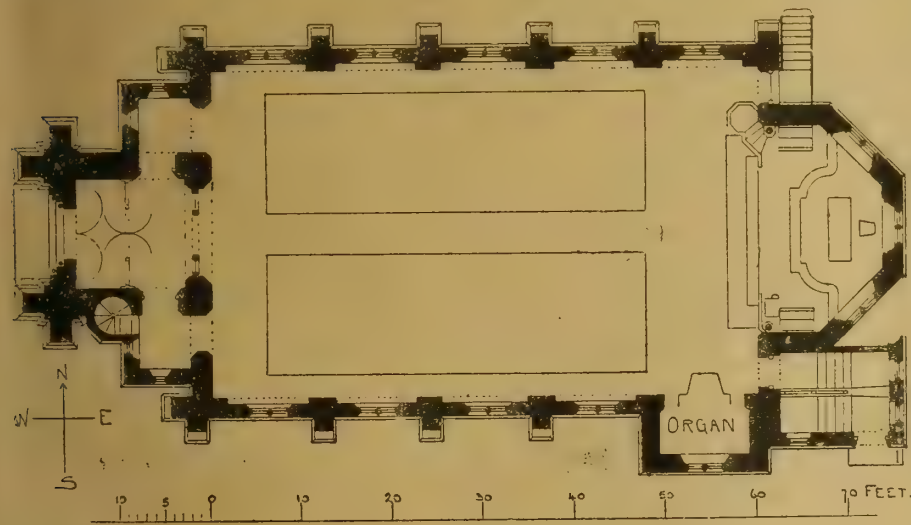
THE "ARK OF THE COVENANT," STAMFORD HILL.—NEW MUNICIPAL BUILDINGS, DOUGLAS.—BRAMHALL HALL, CHESHIRE.—HOUSE AT ROCHDALE.—ADDITION TO THE TEMPERATE HOUSE, NEW GARDENS.

Our Illustrations.

"THE ARK OF THE COVENANT," ROOKWOOD ROAD, STAMFORD HILL, N.

An attempt has been made in this building to impart a little originality in making a departure from the usual church plan, and by the use of sculpture to add an additional interest to the structure. In order to insure

Both Enoch and Elijah are clothed in white. The three west windows represent the Rising of the Sun of Righteousness, the rejoicing of the inhabitants of heaven and of earth, and the flight of the powers of darkness. The sun is rising above the dark blue sea; its upward rays form angels clad in ruby. In the side windows are four figures with bat-like wings, representing Pain, Death, Sorrow, and Crying; fierce flames spring up about their path. Death and Sorrow are clothed in white, and clasp a serpent to their breasts. The other figures are in shades of crimson mauve. To avoid overdoing the effect, it was decided to have no figure-subjects in the nave windows, but floral patterns only. Each of these windows has been drawn out full-size by Mr. Crane; his coloured sketch designs were to 1½ in. scale. The subjects for the sculpture were taken from Rev. iv. 6-8. The four "beasts" in bronze occur, instead of pinnacles, at the base of the spire, and again in stone on the buttresses beside the west doorway, where they are represented as trampling down figures symbolical of Death, Sorrow, Crying, and Pain. These four figures—the Man, the Lion, the Ox, and the Eagle—usually identified with the four Evangelists, are the oldest religious symbols which are known to us: they occur, more or less distinctly, in the works of most of the nations of antiquity. Frequently, the four figures are treated as one, making a sort of griffin. In the Assyrian sculptures, figures combining the characteristics of the man and the eagle are frequent, also of the lion and the ox; but sometimes the figures are represented separately, as in the harem at Khorsabad, where the eagle, ox, and lion are worked in a sort of mosaic of glazed tiles. The Assyrian bulls, which were sculptured at the entrances to the palaces, are supposed by some archaeologists to indicate a legendary knowledge on the part of the Assyrians, of the cherubim that guarded the entrance to the garden of Eden. The architects, therefore, felt that to carve the "four living creatures" at the sides of the west doorway to their "Ark of the Covenant" at Stamford Hill would, at least, be in accordance with ancient precedent.



that the stained glass should be fully in the spirit of modern decorator's art that part of the work was placed in the hands of Mr. Walter Crane. The windows were executed by Mr. J. Sylvester Sparrow, of West Kensington, and the result is, in the architects' opinion, an advance on any work of the kind that they are acquainted with. Mr. Crane is not responsible for the subjects of these windows, except those in the nave. The centre window of the apse shows, in the right-hand light, the Lion of the Tribe of Judah holding a banner, on which are depicted symbols of the Millennium; in the left-hand light is a dove bearing a sceptre, typical of the reign of the Holy Ghost. The dove, a fine piece of colouring in delicate mother-of-pearl, shows in clear relief against the background of lily-stalks, which expand into flowers in the upper part of the window. The side windows in the apse represent the translation of Enoch and of Elijah; a diademed angel, with rainbow-coloured wings, is supporting Enoch, who looks up at the opening heavens. His relatives witness the scene with wonder. Elijah is borne upwards in a chariot of iridescent flames: the horses have fiery wings. His crimson cloak is falling upon Elisha.

These figures have doubtless some important signification, for they are represented in the Book of Revelation as being the nearest to the Throne of God, and, by their song, leading as it were the worship of the Heavenly Host (Rev. iv. 6-11). The sculpture was intrusted to Mr. A. G. Walker, of Cedar Studios, Glebe-place, Chelsea, whose drawings of the four beasts are illustrated herewith. Mr. Richard Silver, J.P., of Maidenhead, has superintended the building works. The contract with his firm for the carcass of the building was about £8,000. Messrs. Silver and Sons subsequently executed the oak fittings at a cost of about £1,000. The rest of the works cost another £5,000, including £800 for the organ, which was made by Messrs. Willis and Sons, under the superintendence of Dr. Martin, the organist of St. Paul's Cathedral. The wood-carving was undertaken by Miss Rowe, of the School of Woodcarving, in Exhibition-road, in conjunction with Mr. M. Murphy, of Chelsea. The phosphor-bronze gasfittings were made by Messrs. Hardman and Powell. The key of the church can be obtained by appointment with the architects, Messrs. Jos. Morris and Sons, architects, 156,

Friar-street, Reading; or at Mrs. Vincent's, the caretaker, 36, Hillside-road, near Stamford Hill Station. The photographs (reproduced) were taken by Mr. G. R. Wood, of Brewery-road, N.

NEW MUNICIPAL BUILDINGS AND PUBLIC OFFICES, DOUGLAS, ISLE OF MAN: SELECTED DESIGN.

We have not received any particulars descriptive of this design, which has been awarded the first premium in the recent open competition settled a few weeks ago. In execution it is just probable that the front entrance may be shifted from its present position to the Ridgway-street front, and some other trifling alterations may be made, a not uncommon circumstance in competition work. The plans given clearly show the proposed internal arrangements of the buildings on both the principal floors. The cost contemplated is £10,000. Mr. Arthur Ardron, F.R.I.B.A., of Westminster, is the architect.

BRAMHALL HALL, CHESHIRE, BY JOSEPH NASH.

The last reproduction after this master which we have given appeared in our Double Number, Jan. 1st last, when we gave an interior of Bramhall Hall. From the same house we now publish another view. An account of the house was printed with plans in the BUILDING NEWS for Jan. 13, 1888, when we gave a drawing by Mr. Maurice B. Adams, of the mansion. Other views have appeared in our issues for Oct. 2, 1896, and we commenced our series of reproductions after Nash on Jan. 5, 1895. The present plate is taken from that lent us by Mr. W. T. Oldrieve, of H.M. Office of Works.

HOUSE AT ROCHDALE.

This house is being erected within its own grounds in a suburb of Rochdale. The walls are faced with 2½ in. Ruabon bricks, with Yorkshire stone-polished dressings to windows, &c.; part of the walls are tile-hung, as shown, and the roofs are covered with Ruabon tiles; the floors of hall and lobbies are laid with mosaic, and the whole of the ground floor has concrete floors, the breakfast, dining, and drawing-room floors being finished in wood blocks of various hard woods. There is a basement throughout; the billiard-room therein has tiled walls from floor to ceiling. A complete suite of stables is being erected in another part of the grounds. Messrs. T. Ashworth and Sons, of Norden, are the contractors for the masonry and brickwork, and the other contracts have been let to Mr. Thomas Crabtree, of Rochdale. Messrs. Butterworth and Duncan, of South-parade, Rochdale, are the architects.

THE NEW TEMPERATE HOUSE, NEW GARDENS.

(For description and further sketches, see pp. 234-5.)

CHIPS.

A bronze medallion portrait of the late Dr. Caldicott, which is to be placed in the large hall of Bristol Grammar School, is approaching completion. This work was intrusted to Mr. George Frampton, A.R.A.

The opening banquet of the thirty-sixth exhibition of the Royal Glasgow Institute of Fine Arts was held on Friday night in the Institute Galleries, when there was an attendance of 150 gentlemen. Mr. A. J. Kirkpatrick, president of the Institute, occupied the chair, and the croupiers were Mr. Patrick S. Dunn and Mr. David S. Tullis.

Despite the desire of the local authorities to widen part of Bow-road by demolishing Bow Church, it has been decided not to entertain the proposal to that effect.

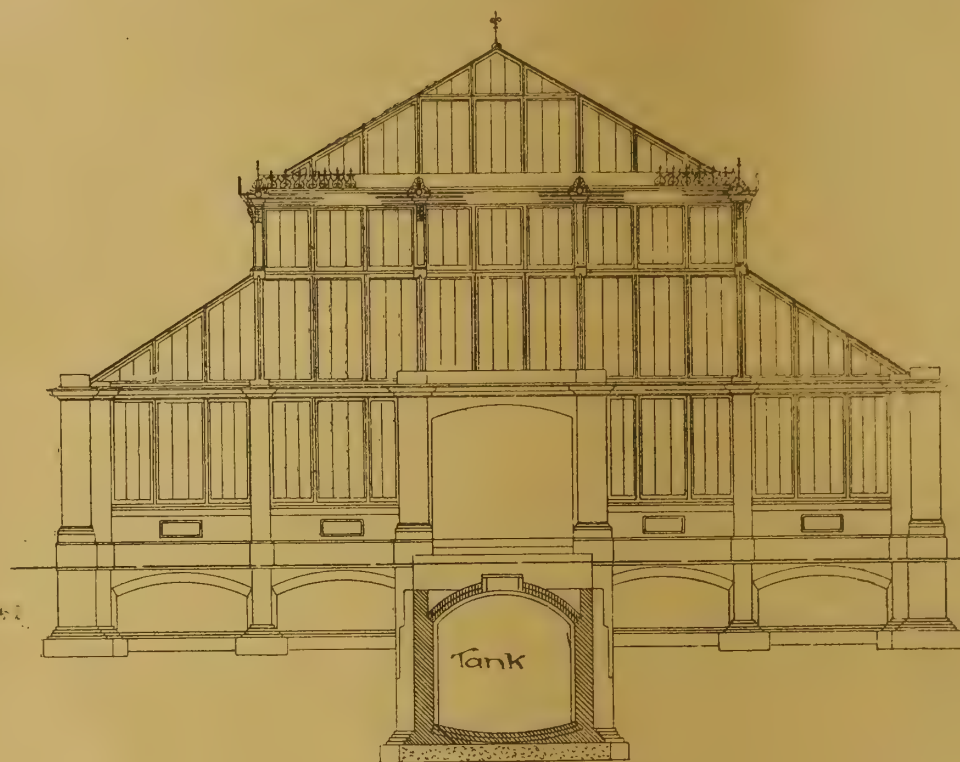
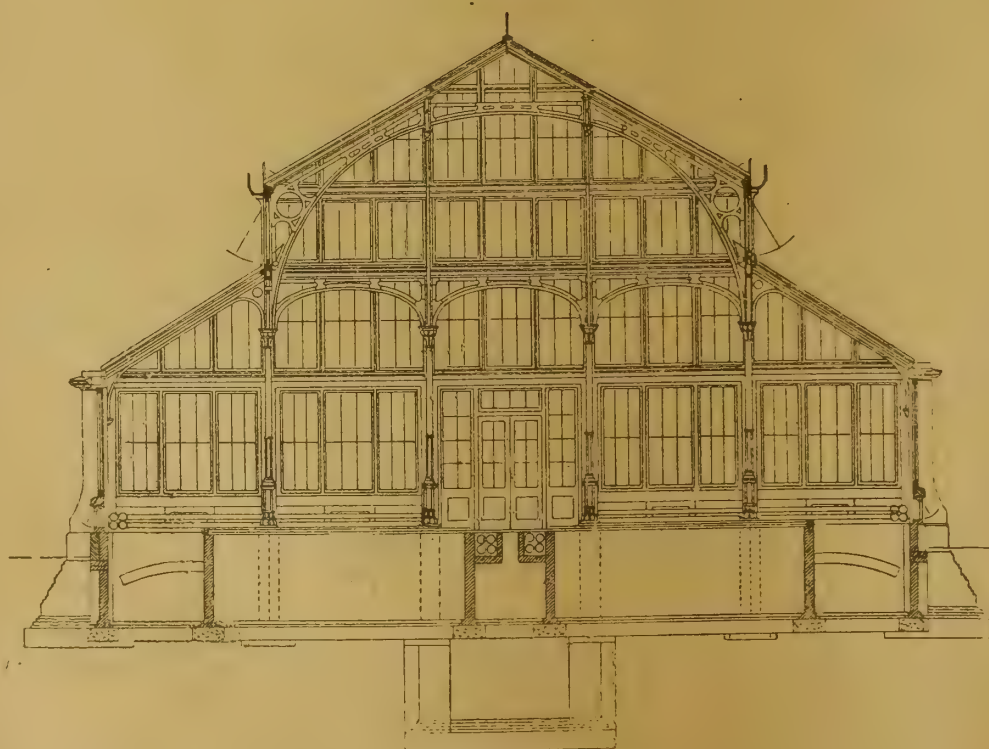
At a meeting of Heath Town District Council, on Tuesday week, amended terms for the purchase of land at Coven from Mr. A. S. Hill, Q.C., M.P., for a sewage farm were approved, and it was resolved to apply to the Local Government Board for permission to borrow the sum of £14,000 to carry out the sewerage scheme.

The engineer to the Midland Railway Company has prepared the Parliamentary estimates of the capital expenditure required in the event of Parliament sanctioning the new works sought to be constructed under the Bill of the present session. The total estimated outlay is £943,918, of which £248,324 will be expended upon new railways in Yorkshire, £619,822 upon new lines commencing in Derbyshire, and £85,772 upon widening their railway at Nottingham Station. The proposed extensions in Yorkshire divide themselves into the Stairfoot and Cudworth Railway, 2½ miles long, to cost £112,306, and the Treeton and Brightside Railway, 3½ miles long, which will cost £136,018.



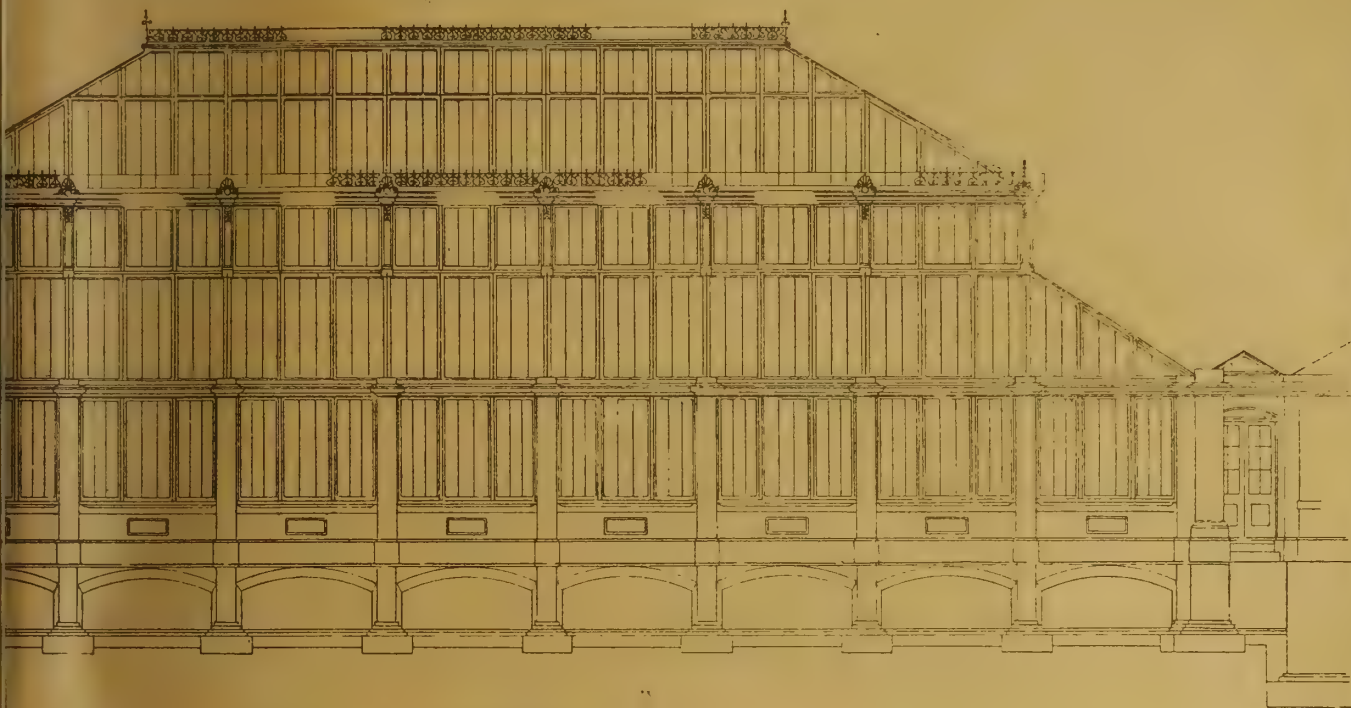
## : KEW · BOTANIC · GARDENS

## · NEW WINGS · TO · TEMPERA

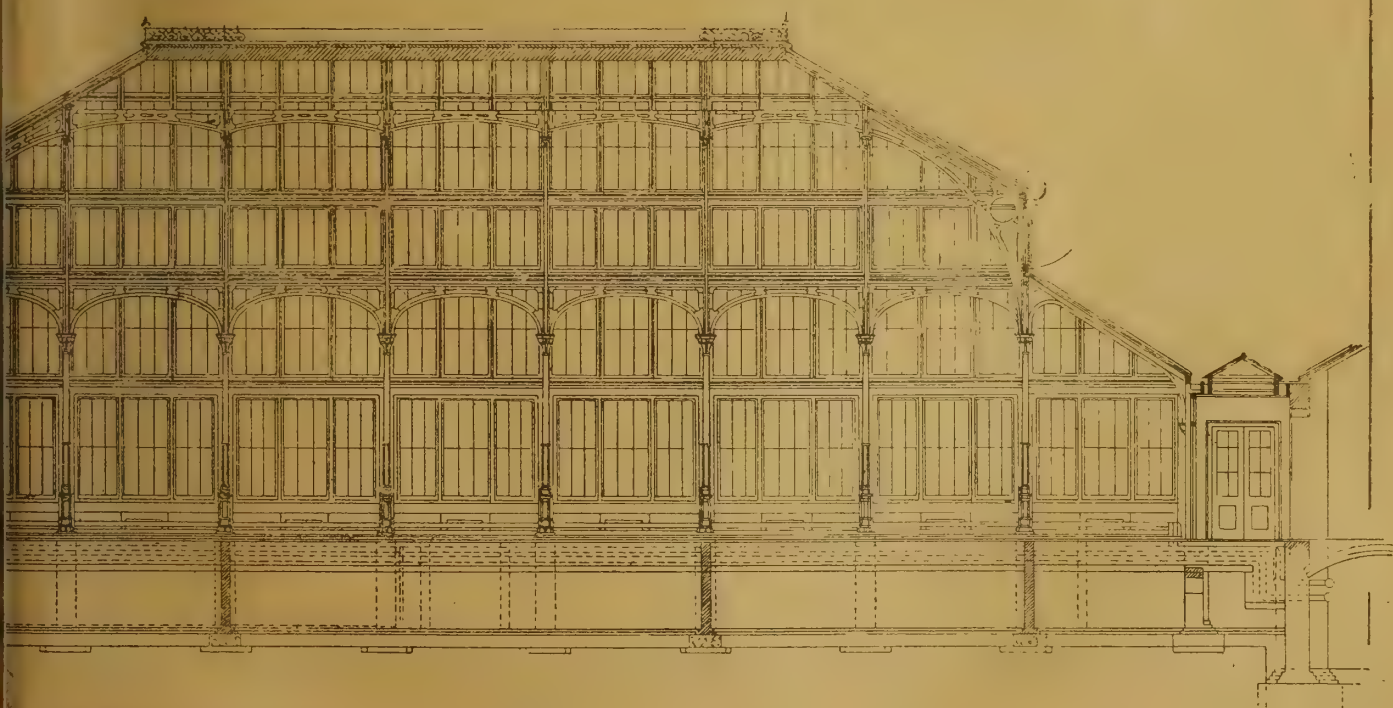
END · ELEVATIONCROSS · SECTION



# HOUSE



· SIDE ELEVATION ·



· LONGITUDINAL SECTION ·

E O RIVERS ARCHT

MANUFACTURE OF WORKS.  
LONDON.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 832, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. J. S.—C. C. and Son.—B. R. S. Co.—H. W. (Liverpool).—N. E. S.—W. W.

## "BUILDING NEWS" DESIGNING CLUB.

## FIFTH LIST OF SUBJECTS.

E. A small country house for a private gentleman, to cost about £5,000, and situate in a hilly district on a site having a fall from east to west of 1 in 12. The entrance front is on the north side. The prospect is towards the south-west. The house to be on three floors, the upper rooms being contrived in the roof to some extent. Material, brick with hard stone sparingly used. Style to be English Renaissance. Accommodation to comprise hall, dining-room, drawing-room, billiard-room, and "own room" on the ground floor at least. A day and night nursery necessary, and a breakfast-room would be a convenience if it can be economically introduced. On the first floor five or six bedrooms and four on upper floor. Back stairs desirable. The main staircase to be 4ft. wide and so placed as to be out of view of the entrance. Good kitchen and offices, housemaid's closet, two baths, and three w.c.s. The problem is how to arrange the accommodation in a practical and artistic manner with convenience to the occupiers, and not overlooking the sum at the designer's disposal. Three elevations, one section, three plans, and view. Scale for elevations 8ft. to the inch. Other drawings may be to one-sixteenth of an inch. A perspective sketch desirable.

DRAWINGS RECEIVED.—"Swan," "Agon," "Nutm," "Too Much Trouble," "Halsted," "Manxman," "Wolf," "Q.E.D.," "Rex," "Oblivisci non Possum," "K. K.," "Devonia," "Charley's Aunt," "Castile," "The Dingy," "Percy," "Ashleigh," "Jupiter," "Boreas," "Veritas," "E. G.," "Don't Know," "Hopton," "Ulan," "St. Leonard," "Ard," "Tyke," "Aikane," "Torredor," "Pantile," "Nap," "Look," "Ashton," "Diver," "Pickles," "White Friar," "The Mammoth" (too late).

## Correspondence.

## RESTORATION.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Turner's paper on "Restoration," recently read before the Society of Architects, and reported in your last week's issue, was somewhat alarming. Yet it will serve a useful purpose; it will put us on our guard. Ostensibly

his statements express the policy pursued by the Society for the Preservation of Ancient Buildings. But instead of preserving the ancient they supplant it with modern, and we may well doubt its past doings and regard with apprehension its future designs. For with this society the restoration of old work apparently means, not liberty to follow out the intention of the originator of the building, but license to exercise its own originality and incongruity according to its freak. Interlarded as the paper is with incompatible observations, we will notice a few only. It says: "If the old work is in existence I would sooner have it than anything else. One form of copying is to make new work of the same design as the old." Here is praise. But we are warned against imitation, for "To imitate old work is to falsify history and to degrade art." Yet imitation is the sincerest form of flattery. We are told: "Over all, we must aim at truthfulness." Yet in another place we are instructed that *over some* (stones) we must put 1½ in. of plaster. To imitate would destroy "associations of veneration." Yet they certainly would not be inspired by modern originality.

Difficulties are created about the restoration of partly-decayed flag-paving; the kinds of stone to be used to replace those that are crumbling in the walls; timber and covering for roofs and framing of principals. In all these, why not keep closely to the old? It has lasted long. Restorers are asked "to do something original," and the writer says "I feel sure they could do so." About this there is not the slightest doubt, and unfortunately many of us do not want asking twice. If this is all that is required of us, let it be displayed in a distinct section. We might tack on a Henry the VII.'s chapel for instance. When exercised this quality on the Westminster Abbey towers. But no one denies that to have been faithful to the existing work would have secured him a more enviable reputation in this particular. Do not let us tamper with the work of other men. If the shade of the good old architect could speak we should be justly reprov'd for plastering the stone put in by him instead of making a good job of it; altering the framing of his principals instead of reconstructing them in the same timber and form as he did without tie rods. Put yourself in his place. Should you like a 30th century man to improve your work out of existence? Observe the Golden Rule. But the leading question seems to be: What is Restoration? We are given two definitions:—(1) Putting back or replacing something that has gone. This was approved. (2) The making of new imitation work to take the place of that which is missing. This was slighted. Now, if in the second definition "new imitation work" does not mean the 1½ in. plaster theory, to which reference has been made, but good honest endeavour to reproduce what was taken out, then, to it we offer no objection. Nor can there then be any difference between the two definitions. But we are no sooner recovered from the fright produced by the thought of that awful word "imitation" than over us is suspended the sword of Damocles by this thread: "the authorities at the National Gallery do not allow a torn or damaged picture" to be made good.

We might with equal force reply, But they once did; and we have only to remember that neither the National Gallery nor its authorities are perfect. If architecture is history in stone, we should not mutilate the chapters on the 13th, 14th, or 15th-century Gothic, nor put in 19th-century irrelevancies. Each may be good in itself, but to mix is to destroy. It is like following facts faithfully for the most part when writing early English history, but because the old records are defaced here and there supplying the deficiencies by putting in a rifle or a maxim gun among the bows and arrows. To us true restoration consists first in catching the spirit and the letter of the original master's intentions, and then "putting back or replacing something that has gone."—I am, &c., W. F. S.

## THE DIVINING ROD.

SIR,—I notice in your last issue (Feb. 5th) a letter from "Nemo"—a very appropriate *nom de plume*—on the above subject. It must be some considerable time since your readers were treated to such a brilliant display of almighty "I's"—in fact, the alphabet of "Nemo" consists principally of that egotistical letter. And a power beyond doubt possessed in a marked degree by some men, which has baffled the skill of our most eminent

physicians to account for, he, in a few jauntily-turned phrases, put down in some such style as a schoolboy would parse a simple sentence, and airily concludes with the experience "I" have had with the divining rod.

Mr. Stone, of Old Bolingbroke Hall, whose genial features are depicted in an advertisement published in your interesting journal, appears to have upset the equilibrium—or, in Yankee phrase, "riz the dander"—of "Nemo," and it requires very little perspicacity to see that the egotistical tirade of "Nemo" is distinctly launched at Mr. Stone.

At Hareby, in Lincolnshire, a farm of 1,000 acres was supplied with water by pumping from a well many feet deep, which invariably went dry in an ordinary summer. Mr. Stone was called in to give an opinion as to the existence, or otherwise, of a good spring supply, and only 40 yards away from the deep well, said that a good supply would be procured for all time, and that at a depth of 8ft. to 9ft. He laid all the piping, built a reservoir, did everything necessary for the object in view ere he tapped the spring (8ft. 6in.), which runs week in week out, and is no way affected by the dryness, or otherwise, of the season. Methinks no man outside of an asylum would spend from £150 to £200 (not one penny of which he would ever see again in case of failure) unless he knew with an unerring certainty that what the divining rod showed him was neither charlatanism nor humbug. I could mention several other cases, but have no wish to give Mr. Stone a cheap advertisement in your valuable columns; but as an Englishman must protest against the vindictive and absurd utterances of your correspondent "Nemo," who probably could treat us to what "I" can do in giving a theory, from the capsizing of a steamboat to the bursting of a bicycle tire.—I inclose card, and am, &c., LINCOLN.

## CHIPS.

The restoration of the parish church of St. Blazey, Cornwall, is about to be commenced from plans by Mr. Edmund Sedding, of Plymouth. The first section will include the renewal of roofs and the alteration of galleries and pews.

The business done at the Auction Mart last week was of a satisfactory character. The aggregate realisation was £39,582, as officially recorded, which compares well with that of the corresponding week last year, £31,890. The amount, moreover, does not include the letting of the site of Hanover Chapel, Regent-street. Licensed properties maintained the extraordinary prices which now seem to be customary, and all round the tone of the market was exceedingly good.

The Wolverhampton Board of Guardians again discussed, on Friday, the proposal to build a new workhouse, and by 11 votes to 10, decided to provide for all the indoor poor in the union. Further resolutions were agreed to by which the clerk was instructed to advertise for offers of a site of not less than 40 acres, on which to erect the necessary buildings; that the clerk obtain particulars of any recently-erected workhouses that may afford assistance to the Board in determining the character and arrangement of the new buildings; and that a committee be appointed to consider the offers of sites, and engage professional assistance.

A meeting of the Batley Corporation was held at the Town Hall on the 4th inst., when a resolution of the General Works Committee, to appoint Mr. Oscar J. Kirby, Assoc.M.I.C.E., at present the waterworks engineer and manager, as borough surveyor, at a salary of £250 per annum, subject to his resigning the office of waterworks manager, was confirmed after a long discussion. Mr. Kirby will make all the extensions to the impounding works for the water supply.

A partnership has been entered into between Mr. J. B. Colson (Messrs Colson and Son), of Winchester, and Messrs. Farrow and Nisbett (Messrs. Pink, Farrow and Nisbett), of London, who will for the future carry on their business as architects under the style and title of Colson, Farrow, and Nisbett, with offices at 45, Jewry-street, Winchester, and 7, New-court, Carey-street, Lincoln's Inn, London. The appointment of architectural surveyor to the Dean and Chapter, together with the various agencies to which he succeeded on the death of his father in 1895, will be retained by Mr. Colson personally.

The inquiry respecting the application by the Walsall Rural District Council for sanction to a loan of £9,500, for the purposes of sewerage and sewage disposal at Rushall and Pelsall, was resumed on Monday, at the National School, Pelsall, by Colonel J. T. Marsh, R.E., on behalf of the Local Government Board.



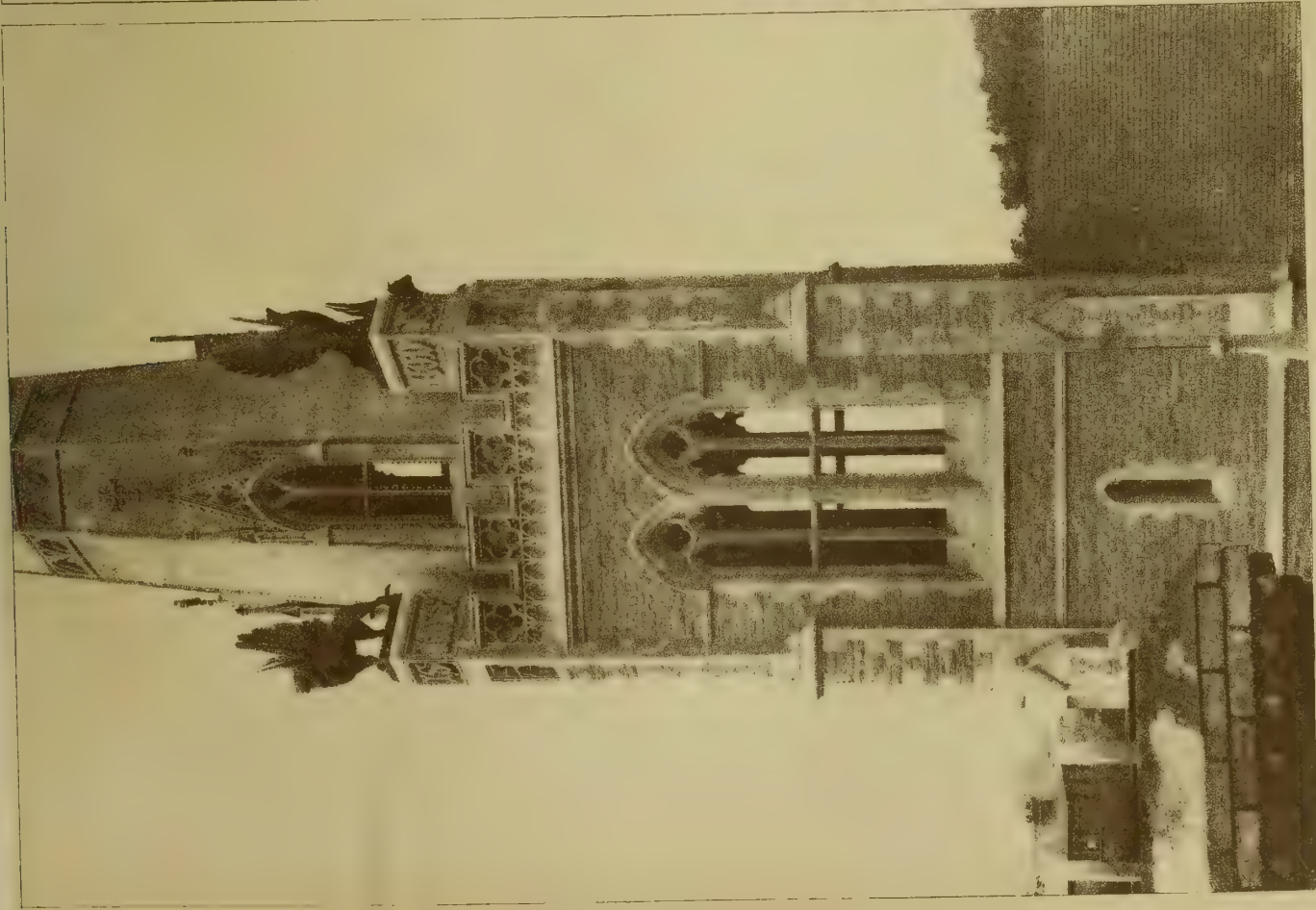


PHOTO TINT

"THE ARK OF THE COVENANT" STAMFORD HILL, N.







FIRST-FLOOR PLAN

The diagram is a hand-drawn architectural floor plan of the first floor of a building. The layout is as follows:

- Top Left:** A large rectangular room labeled "REFERENCE ROOM" with a dashed line indicating a section. Below it is a "LIBRARIAN" station and a "BOOK STORE OF STAFF".
- Top Center:** A "COUNCIL CHAMBER" with a "PUBLIC GALLERY" running along its top wall. A "STAIRCASE" leads from the gallery area to a "TOWER" and "FLAT OVER TOWER" above.
- Top Right:** A "COMMITTEE ROOM" and a "WAITING ROOM". Below the waiting room is a "LAVATORY" and two "WC" (water closets) rooms. A "GUESTS' STAIRCASE" is located near the lavatory.
- Bottom Left:** A "LANDING" area with a "STORE" and a "DINING" area with a table and chairs.
- Bottom Center:** A "CORRIDOR" connecting the central areas.
- Bottom Right:** Two "COMMITTEE ROOM"s.
- Other Features:** A "LOBBY" is located between the reference room and the council chamber. A "STAIRCASE" is also shown near the lavatory.

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NEW MUNICIPAL BUILDINGS & PUBLIC OFFICES, DOUGLAS, ISLE OF MAN.  
SELECTED DESIGN BY ARTHUR ARDRON, F.R.I.B.A., ARCHITECT.







# Intercommunication.

## QUESTIONS.

[11618].—**Gas-Taps.**—Could any reader kindly inform me if a gas-tap is made with a square keyhole, which could be adjusted to any ordinary gas-bracket, but only able to be turned on with a key? I have some recollections of seeing one.—J. S.

[11619].—**Ceilings.**—Can any correspondent inform me the best way to mix and render and float ceilings with Portland cement and set with Parian cement—the proportion of each material? Having had some done recently, the Parian setting came off the floating after a few weeks.—C. P.

[11620].—**Granolithic Steps.**—I shall be obliged if someone will tell me the correct way to measure the cubical contents of a granolithic staircase, the rise being 7in., the tread 11in., and the overlap 5in. I say the length of the top and bottom of the tread added together, divided, and multiplied by the depth of the rise, is correct. In measuring a granolithic staircase I am asked to measure it as if it were stone—i.e., 16in. by 7in.—JOHN ELLIS.

[11621].—**Emigration of Architects.**—Will any of your readers inform me which he considers (from experience preferred) the most likely part of the world for a fully qualified architect and surveyor, under 40, to make headway in?—FREEMASON.

[11622].—**Quantities: Yorkshire.**—I, and probably many other of your readers, will be glad for information on the points of difference between the practice in such towns as Leeds and Hull, and that of London. In Leaning's textbook on quantities, there is a chapter on "Northern Practice," which gives the methods followed in Lancashire; but the Yorkshire mode is very different. For instance, the brickwork is probably measured by the rod, which is 63ft. super. of 9in. walling; and openings under a certain width or area are not deducted. On that account some labours that usually form a separate item are omitted from the measurements. There are also, I believe, differences in measuring slaters' work, and in other trades.—X.

## REPLIES.

[11617].—**Window Cleaning.**—Pride's Quaza Window Chair is a simple and effective contrivance that might meet the wishes of your correspondent. I understand that the widow of the patentee is in rather straitened circumstances, and is willing to dispose of the patent at a fair price.—JOHN JONES, 40, Sydney-street, Chelsea, London, S.W.

Plans prepared by Mr. W. Hattrell have been accepted for a new Wesleyan chapel to be erected at the corner of Eagle-street and Stoney Stanton-road, Coventry. The estimated cost is about £4,000. The present chapel, on a part of the same site, is a comparatively recent erection, and is intended to be used as a Sunday school.

A new infectious diseases hospital is being erected at Denbigh, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

A new Baptist chapel and schools were opened on Sunday in Nelson-street, Lancaster, in place of the buildings in White Cross-street, recently destroyed by fire. The buildings have cost about £5,000, are constructed of stone, and fitted with the electric light. The chapel seats 500 persons.

The Galician Diet unanimously passed on Monday a resolution for the restoration of the historic Royal Castle on the Wawel, at Cracow, now used as a barracks. The intention is to offer it to the Austrian Emperor, on the occasion of his jubilee in December, 1893, as an Imperial residence. The castle was the seat of the Polish Kings up to 1610, and the cathedral inclosed within its walls, a Gothic building, was, up to 1764, the Coronation Church. In the Central Chapel the Polish national saint, Stanislaus, is buried, and in the eighteen chapels surrounding the aisles are the tombs and monuments of the most famous Polish kings and queens, heroes and poets. A chapel built by the Potocki family contains a statue by Thorwaldsen.

The bust of Dr. Arnold, by Mr. Alfred Gilbert, R.A., which has been presented to Rugby School, was unveiled in the new school on Monday evening, by the Archbishop of Canterbury. The bust, which is of marble, is of heroic size, and was originally intended for Westminster Abbey; but it was found to be too large for the arcading, and a smaller one was substituted. The bust is placed at the end of the new big school, at the head of the gallery of painted portraits of former headmasters and distinguished Rugbeians. It will ere long stand on a permanent pedestal made from the last of the three elm-trees which stood in the school Close at the time of Dr. Arnold's headmastership, after designs executed by Mr. T. M. Lindsay, art master to the school, and approved by the sculptor.

The formal opening of the first of two water reservoirs at Fowey took place last week. The reservoir is 75ft. by 60ft., and 11ft. 6in. in depth, and holds 400,000 gallons. A second reservoir, capable of holding 500,000 gallons, will be completed in April. Mr. J. H. Parkinson is the contractor, Mr. A. Isbell the clerk of works, and Mr. Bowden the water engineer.

## COMPETITIONS.

MOSELEY, BIRMINGHAM.—At a meeting of the committee, the designs for a new Presbyterian church, lecture hall, &c., to cost £6,000, at the corner of Chantry-road, Moseley, were considered, and out of seven sets of designs submitted, those of Messrs. de Lacy Aherne and Arthur F. McKewan, A.R.I.B.A., were placed first.

## CHIPS.

The South Stoneham Highway Committee have raised the salary of their surveyor, Mr. Cudlopp, from £120 to £140 a year.

The Chatham Loop-line Railway Bill, an unopposed scheme for the construction of a railway from Cuxton to Newington connecting at either end with the London, Chatham, and Dover Railway, the capital asked for being £400,000, has been unexpectedly abandoned.

Major Foley, R.E., and Sir Arthur Mackworth, R.E., have visited Barry with a view to the erection of a fort on Barry Island. The plans have been completed, and the work will be commenced in the spring.

The plans of the Broadway Theatre at Deptford have been approved by the London County Council. The theatre will be one of the largest in the Metropolis, and the plans have been prepared by Mr. W. G. R. Sprague, the architect of several of the latest suburban and provincial theatres. The work of clearing the site has commenced, and the theatre is expected to be ready by next October. The cost of the building and site will be £45,000.

The new schools, Barry Dock, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The new waterworks for Troon, N.B., are nearly completed, and will shortly be formally opened by the Duchess of Portland. The water-supply is derived from the western and southern slopes of the Dundonald Hills. The reservoir, near Colennan, has a depth of 31ft., and covers an area of 11 acres. It will contain 44,000,000 gallons of water, sufficient to give a supply of 240,000 gallons per day to Troon during 183 days, even although no water is collected during that time. The filters and clear-water tank are immediately outside the reservoir embankment.

The work at the national basilica of the Sacred Heart at Montmartre, Paris, continues its progress. The crypt, with its sixteen chapels, is now finished. The dome, the campanile, the windows, and the mosaic and sculpture-work are still unfinished, and it is estimated that another 30 millions of francs will be required, which will bring the total outlay to as much more, or about 2½ millions sterling.

Portions of the masonry of the spire of St. Augustine's Church, Hagley-row, Birmingham, have been falling at intervals since Christmas on to the roof of the church from a crack high up on the east side, and under the direction of Mr. F. B. Osborn, a scaffolding is being erected to reach the seat of the mischief. In consequence of the damage caused by the fall of a large piece of stone on Saturday, no services were held in the church on Sunday. The church is rather more than a quarter of a century old, but the tower and spire were not added till about twenty years ago. The structure is in the Gothic style, and the octagonal spire, rising to a height of 185ft., has been much admired for its graceful outline. Its insecurity is supposed to be due to the earthquake shock of last December acting on a fault produced by the spire having previously been struck by lightning. The damage appears to be about 25ft. or 30ft. from the top, and it is anticipated that the spire will have to be taken down and rebuilt from the lowest point to which the mischief extends.

The Light Railway Commissioners (Lord Jersey, Col. Boughie, and Mr. Gerald Fitzgerald) held an inquiry on Friday at the Great Northern Hotel, Leeds, concerning an application to construct a light railway in Rothwell Urban District in connection with the East and West Yorkshire Union Railways. The proposed line will be only two miles in length, extending from Robin Hood, between Carlton and Lofthouse, to Royd's Green. Messrs. Mammatt and White, of Leeds, are the engineers. The application was acceded to, no opposition being offered.

A meeting was held at the Halifax Town Hall on Thursday evening in last week, with the object of considering the question of erecting a public hall at Halifax, in commemoration of the Queen's reign. The idea is to erect a hall in commemoration of the Diamond Jubilee of Her Majesty, by forming a company, with a capital of £30,000 in £1 shares. Besides erecting a hall to accommodate about 2,000 persons, it is proposed to make provision for a number of shops. The mayor favours the idea of local architects being invited to prepare competitive plans.

## LEGAL INTELLIGENCE.

LEEDS.—The award of Mr. J. F. Field, of Chancery-lane, London, who sat as umpire in an arbitration held at the Leeds Town Hall at the close of last year, relative to the sum to be paid by the corporation for the compulsory purchase of the Black Swan Hotel, Vicar-lane, the property of Mrs. Emma Scholey, arrived in Leeds on Monday. The property is required for the widening of Vicar-lane, and at the inquiry the claimant's witnesses thought £9,674 would be a fair sum for the umpire to award, whilst for the corporation witnesses were called, who, disputing the claim put in for trade compensation, thought Mrs. Scholey ought to be satisfied with £6,728. The umpire awards £8,199.

A BUILDING MANAGER AND HIS PRINCIPALS.—MESSRS. V. SAUNDERS AND OTHERS.—In this case, reported by us last week, p. 221, the Official Referee, Mr. Ridley, gave judgment in accordance with a settlement arrived at between the parties against the defendant Hewat for £2,000 and for £200 as against the defendant firm, with costs.

THE BIRMINGHAM WATER SUPPLY.—At the Surveyors' Institute, on February 2nd and 3rd, before Mr. Christopher Oakley as umpire and Mr. S. Williams and Mr. E. Vigers as arbitrators, the arbitration case was resumed, in which the Rev. E. W. Prickard, as tenant for life, claims from the Birmingham Corporation upwards of £35,000 for his freehold land and sheep-walks, which the corporation require in connection with their scheme for obtaining a water supply from Wales. The land involved comprises 298 acres of freehold and 2,546 acres of common land situate in the counties of Radnor and Montgomery, near Rhayader. The question was discussed as to whether the corporation, which proposed to supply three sheep-washes, each of 30,000 gallons, which would be filled twice a day, were offering an adequate and proper supply of these washing-places. The case for the claimant was concluded, and witnesses were called for the corporation. Mr. James Mansergh, the engineer of the Birmingham Corporation, was examined, and stated that they were bound to provide sufficient washing-places, and were prepared to do so. He believed the site was one of the best in Wales—he certainly had not chosen the worst. They expected to finish the works by 1902. Mr. T. S. Miller, of Brecon, estate agent, and valuer, Mr. Thomas Evans, of Abergwmmg, Mr. Robert Gardner, a land agent in Cardiganshire, Mr. John Morgan Davis, a land agent and surveyor, and Mr. Daniel Watney gave evidence. This closed the case for the corporation, and the sitting was adjourned.

The trustees of the P.M. chapel, New Brompton, Kent, approved of sketch plans for new chapel and Sunday schools to be built upon site where existing iron church stands (Gillingham-road), and instructed their architect, Mr. E. J. Hammond, New Brompton, on Tuesday last, to proceed with plans and specification forthwith.

The Renfrew and Clydebank Joint Hospital, situated at Blawarthill, near Yoker, and erected by the burghs of Renfrew and Clydebank and the Renfrewshire County Council, was formally opened on the 4th inst. The buildings are of the cottage type, and the total estimated cost is about £10,000.

Amongst recent donations the committee of the Manchester Whitworth Institute have lately received a series of proof engravings of historical institutions and places of interest—viz., cathedrals, castles, abbeys, cities, and towns of England and Wales, after J. M. W. Turner, R.A. These works are now on view on screens in the central gallery. A selection of ancient Egyptian textiles, presented by Professor Flinders Petrie, is now exhibited, for a time, on screens in the north gallery.

Mr. Webster, C.E., of Peterborough, has received the appointment of locomotive superintendent of the Leeds and Ardsley districts of the Great Northern Railway Company, in succession to the late Mr. Drage. Mr. Webster was apprenticed under the late Mr. Stirling, at the company's works at Doncaster, and has for the last eleven years been assistant-superintendent at Peterborough.

The Local Government Board have sanctioned loans to the amount of £7,000 for carrying out the sewerage and sewage-disposal works at Knaresborough. Two sections of the work have been completed. On Wednesday week Mr. Luard, R.E., Local Government Inspector, held an inquiry, on an application of the Urban Council to borrow an additional £1,800 for completing the third and last portion of the scheme.

One of the aisle windows in St. Andrew's Church, Cheltenham, has just been filled in with stained glass, as a memorial to the late Mrs. Bennett. The window consists of two lights with tracery, the subject illustrated being the three Marys and the Angel at the sepulchre of Our Lord. It was designed and executed by Messrs. Joseph Bell and Sons, of Bristol.



## WATER SUPPLY AND SANITARY MATTERS.

NEWPORT PAGNELL.—The Newport Pagnell Rural District Council have instructed Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, to prepare a scheme of main sewerage and sewage disposal for the town of Newport Pagnell, Buckinghamshire, to obviate the pollution of the Rivers Ouzel and Ouse.

YORK.—The half-yearly report of the directors of the York Waterworks Company states that the new pumping machinery and boilers have been erected, and are now working satisfactorily. Messrs. James Simpson and Company, Limited, engineers, of Pimlico, London, have supplied and fixed the engines and boilers. The engine is a compound condensing receiver engine, with cylinders coupled together with cranks at right angles, and driving direct two pumps having a capacity to deliver 3,500,000 gallons of water per day of 24 hours, into the water-mains of the city. The pumps draw their water from a clear water-well about 170 yards from the new engine-house, through a 24in. pipe. The suction main is composed entirely of cast-iron flanged pipes. The house for the new engine has been built by Messrs. Parker and Sharp, contractors, York, under the superintendence of, and in accordance with plans prepared by, Mr. W. G. Penty, architect, York.

New jewellers' premises have just been built at the corner of Dolphin and Narrow Wine-streets, Bristol, from designs by Mr. James Hart, of Cornstreet, in that city. Messrs. Cowlin and Sons, also of Bristol, were the builders.

Mr. T. E. Ellis, M.P., on Wednesday last opened the pupil teachers' school, Cardiff, and which has been in the course of erection during the last twelve months. The buildings were erected from the designs of Messrs. J. P. Jones, Richards, and Budgen, and built by Messrs. W. Thomas and Co.

The partnership heretofore subsisting between C. C. E. Dennett and J. H. Williamson, jun., of Nottingham and elsewhere, builders and contractors, under the style of Dennett and Williamson, has been dissolved.

The city council of Bristol decided on Tuesday to raise the salary of Mr. McCurric, the docks engineer, from £800 to £1,000 a year. Mr. McCurric was appointed in 1885 at a salary of £600, Mr. Girdlestone, his predecessor, having enjoyed a yearly emolument of £925.

There has been presented to the Bolton Corporation, in commemoration of the Queen's Diamond Jubilee, a plot of 1,150 square yards of freehold land in Marsh Fold-lane, Halliwell, for the purposes of a recreation ground.

The Haberdasher Company's schools at Hoxton are about to be removed from their present location, the buildings having been sold to the London County Council for the purposes of a technical institution. The schools will probably be transferred to Hampstead.

At Colchester Town Council meeting on Wednesday week, the electric works committee recommended the acceptance of an offer of the Electric Construction Company to work the plant for two years, and on receiving the payments for current, to pay the corporation £800 per annum to cover interest on capital and sinking fund. The report was adopted.

The Lancashire County Council have sanctioned opposition to the proposal of the Manchester Corporation to pour sewage effluent into the Mersey above Warrington.

The Prince and Princess of Wales have fixed Saturday, May 22, at half-past three, for the opening of the Blackwall Tunnel.

The London County Council discussed on Tuesday the recommendations of the Parliamentary Committee, that the agreements with the corporations of Croydon and West Ham, and with the Essex County Council, in respect to future legislation on the water supply of London and its surrounding areas, should be approved. Sir J. Lubbock and Lord Onslow opposed the decision of the committee, which was, however, sustained by a majority of ten, and the recommendations of the committee were adopted.

Lord Penrhyn has issued a notice to the men lately employed at the quarries offering them "an opportunity to return to work upon the same conditions as before the strike."

At a meeting of the Edinburgh Architectural Society, held on Thursday night in last week, in Dowell's Rooms, Mr. N. M. Cumming, vice-president, in the chair, a lecture, entitled "Pre-Conquest Stone-carving in Northumbria," was delivered by Mr. D. J. Vallance, curator of the Edinburgh Museum of Science and Art, and illustrated by limelight views. There was a good attendance.

## Our Office Table.

A CORRESPONDENT sends us a copy of the *Worcestershire and Staffordshire County Express*, in which, in addition to the extraordinary advertisement inserted by an "architect and manufacturer, the Heath, Stourbridge," headed "This Beats All!" which we reproduced last week from another journal (p. 201), an official notice appears, in which the Wollescote School Board invite "tenders for preparing plans for a new infant school to accommodate 400 children; tenders to be sent in at once." Confused ideas seem to prevail in the neighbourhood of Stourbridge as to professional etiquette and the duties of architects.

LORD PLAYFAIR suggests that as a national memorial of the Queen's Diamond Jubilee the present squalid building known as the South Kensington Museum should be replaced by an architectural structure, and the meaningless local name changed to that of the "Victorian Museum." The Earl of Carlisle supports the proposal, pointing out that the space provided in these "rubbishy and haphazard sheds" is even now miserably inadequate to the proper display of the collections. The First Commissioner of Works was, we notice, to be questioned last (Thursday) night as to whether he would endeavour to induce the Treasury to provide the necessary funds by a supplementary vote for completing the new façade selected in competition in 1891—from plans by Mr. Aston Webb, which, by the way, were fully illustrated in our issues of August 7 and 14, Sept. 11, and Nov. 20, 1891. Surely the proposal to carry out this work by public subscriptions ought to be unnecessary—indeed, Mr. Hanbury has already made in the House a half-promise to proceed with it.

THE French School at Athens is about to celebrate its 20th anniversary by an archaeological jubilee, which is to take place from April 26 to 28. It will take the form of a conference on archaeological matters of interest. The questions to be raised will fall under three heads:—(1) Methods to be observed in the search for ancient monuments, and their preservation when found. (2) Means to be employed to facilitate archaeological work, and render it more expeditious and more fruitful. (3) Archaeological teaching. Under the first head the question will be raised whether it is possible and desirable to formulate certain general instructions for the guidance of those engaged in excavations. The meeting is also to discuss such practical details as measures to be observed for protecting antiquities exhumed, and, last, on what principles and to what extent it is desirable to restore ancient monuments such as—e.g., the Parthenon. The second heading includes such practical matters as the desirability of an international archaeological terminology—a uniform system of abbreviations and the like,—and an international bibliography published annually. The third head comprises a discussion as to how far and by what means the study of archaeology and the history of art should be introduced into secondary education. Evidence will be taken as to the results in countries where the experiment has already been made. Suggestions under all the heads are invited from all qualified persons. The committee consists of the directors of the several archaeological institutes at Athens, among them, the English director, Mr. Cecil Smith.

MR. JAMES BELL, C.E., M.Inst.C.E., has been appointed to the post of chief engineer of the North British Railway, in succession to the late Mr. Carsewell. Mr. Bell served the usual apprenticeship in the chief engineer's department of the Company. He entered the office in September, 1860, and in October of that year was appointed resident engineer of the Central section, extending to 280 miles, and of the works appertaining to it, embracing about 58 miles of the East Coast and 52 miles of the western route main lines from Edinburgh to London, besides branches. In 1879 he was appointed assistant engineer, with a general supervision over the system. Among the works Mr. Bell has lately carried out are the renewal of the Bilston viaduct, a span of 330ft., and the connecting lines with the Forth Bridge from Winchburgh and from Corstorphine to the Forth Bridge. In 1895 he completed the doubling of the Edinburgh and Glasgow main lines between Edinburgh and Corstorphine, including the Haymarket tunnel, 1,000 yards in length, under streets and house

property, and also the iron tunnels under the National Gallery, forming the west entrances to the Waverley Station. He is now engaged on the new lines and signalling at the Waverley Station. It is remarkable that Mr. Bell's father was engineer-in-chief from the beginning of the North British Railway till about 1879, when he was succeeded by Mr. Carsewell.

## CHIPS.

Messrs. Harper, of Colmore-row, Birmingham, are making additions to the Birmingham Assay Office. The floors are fireproof on the Fawcett system.

The Government have decided to further open up North-West Ireland by constructing two light extension railways under the Balfour Act, at a cost of £390,000. One line will run from Letterkenny to Burton via Kilmacrenan, Creeslough, and Gweedore, and the other from Buncrana to Carn-donagh.

A large expenditure in military barrack and hospital accommodation in Dublin is in contemplation by the War Office authorities. £165,000 is to be devoted to the construction of a new cavalry barrack to replace Island Bridge Barrack, and £150,000 is to be applied to the work of continuing the repairs to other existing city barracks and providing a new military hospital.

Mr. W. J. Evelyn, J.P., of Wotton, Surrey, has appointed Mr. Reginald S. A. Roumieu (Messrs. Roumieu and Aitchison) as surveyor to his Deptford and Rathbone-place, W., estates.

Operations have been commenced this week preparatory to the erection of a new Caledonian Station for Coatbridge. Messrs. Hugh Symington and Sons, the contractors, have made a start with the work of building the new piers to support the bridge upon which the new station will be partly erected, above the canal and over Bank-street, with entrances from the latter.

The large dining hall of the Hotel Victoria, in the Northumberland-avenue, has been entirely redecorated, under the supervision of Mr. John Fulleylove, R.I. The general scheme of colour is white and gold. In order to obtain as much light as possible, by means of reflection, silvered glass, with white surfaces enriched with gold, has been largely used, while the bases of the columns have been relieved by unusually large metal castings. Glass fillets have also been employed in partitioning the mirrors, and the effect is further enhanced by the free introduction of white marble.

The remainder of the buildings which constitute the Church Institute at Ottery St. Mary were opened on Wednesday in last week. The first portion of the building was opened in September last. The buildings have cost £1,800, and the architect was Mr. E. G. Warren, of Exeter.

The urban district council of Sandbach received an offer at their last meeting from the family of the late Thomas Hyde Marriott to present his residence, the Commons House and grounds, covering in all six acres, for use as a free library, technical school, or school of art, or any other public purpose, the grounds to be preserved as an open space. The gift, which is in commemoration of the Diamond Jubilee, and is unhampered with conditions, was accepted.

Messrs. Harper, of Colmore-road, Birmingham, are making extensive additions to the Clifton Hydro. Messrs. Mark Fawcett and Co., of Westminster, have been entrusted with the constructional steelwork and the fireproof roof.

A window in Tillingham Church, Essex, is about to be filled with stained glass as a memorial to the late Canon Liddon. The work has been entrusted to Mr. F. Drake, of the Close, Exeter.

The Knighton Urban Council having applied to the Local Government Board for sanction to borrow £1,800 for the purchase of the Sheep Market, an inquiry was held by Mr. Robert H. Bicknell, M.I.C.E., on Wednesday in last week.

Mr. T. Baldwin, of Ilford, has been elected surveyor to the Peterborough District Council at a salary of £135 a year.

An appeal is being made for £2,300, the balance of the £6,000 needed for building a central hall at the Battersea Polytechnic, opened in February, 1894.

On Thursday in last week, the dedication of a stained-glass window took place at the parish church of Wrentham, East Suffolk. The window has been inserted on the north side of the church, in memory of the late Mrs. Waterworth, and has been carried out by Mr. L. J. Watts, Castle Steam Works, Colchester. In the centre of the window is a representation of Our Saviour as the Good Shepherd. A marble tablet has been erected on the north wall of the church in memory of the late Rev. Joseph Abbott, who was for 27 years rector of the parish.



## MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Dinner of the London and Provincial Builders' Foremen's Association, Holborn Restaurant. 6.30 p.m.

MONDAY.—Royal Institute of British Architects. "The Garden in Relation to the House," by H. E. Milner. 8 p.m.  
Society of Arts. "Industrial Uses of Cellulose," Cantor Lecture No. 1, by C. F. Cross, F.R.S. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Cold Storage at the London and India Docks." 8 p.m.

Society of Arts. "The Progress of Canada During the Last Sixty Years," by Joseph G. Colmer, C.M.G. 8 p.m.  
Architectural Association of Ireland, Grosvenor Hotel, Dublin. 8 p.m.

WEDNESDAY.—Society of Arts. "Light Railways," by Everard M. Calthrop. 8 p.m.  
Edinburgh Architectural Association. "Notes on Elgin Cathedral," by H. F. Kerr, A.R.I.B.A. Royal Institution, Edinburgh. 8 p.m.

Edinburgh Architectural Society. "Interior Perspective," by W. N. Cumming, A.R.I.B.A. Dowell's Room, Edinburgh. 8 p.m.

THURSDAY.—Society of Arts. "The Mechanical Production of Cold," by Professor J. R. Ewing, F.R.S. 8 p.m.

FRIDAY.—Architectural Association. "The Architects and the Public," by W. H. Bidlake, A.R.I.B.A. 7.30 p.m.

## CHIPS.

The council of the London Chamber of Commerce has recently appointed a special committee (with power to add to their number) to inquire into and report upon the subject of the pernicious practice of giving and receiving secret trade commissions. Mr. David Howard, one of the vice-presidents of the Chamber, has been elected chairman, and Mr. Walter Hazell, M.P., deputy chairman. The committee are willing to receive and consider confidentially any evidence or information on the subject which anyone may be disposed to bring before it.

The Leeds Fine Art Gallery has this week been enriched by gifts of a large work in oils, "Setters and Pointers," by C. H. Schwanfelder, animal painter, who many years ago resided in Leeds; and a small portrait of John N. Rhodes, an old Leeds artist, painted by Drummond, R.A.

In the case of John Edgerton (described in the receiving order as J. Edgerton), Percy House, Ramsey-road, Forest-gate, E., builder, the discharge from bankruptcy has been suspended for two years ending Jan. 14, 1899.

The special committee in charge of the applications for the vacant post of engineer of the Edinburgh and Leith Gasworks have reduced the list to the following:—Mr. G. F. Bell, Stafford; Mr. W. R. Herring, Huddersfield; and Mr. Alexander Wilson, Dawsholm, Glasgow.

Old Bow-street Police-station is now being pulled down, and a warehouse will be erected on its site, which belongs to the Duke of Bedford. When the new Bow-street Police-station was built about 15 years ago, from the designs of Mr. John Taylor, C.E., of H.M. Office of Works, the old building was used as a kind of barracks for single policemen until the lease fell in some 12 months ago.

The death took place in Edinburgh on Sunday of Mr. H. W. Cornillon, S.S.C., who acted as the secretary of the Royal Association for the Promotion of the Fine Arts in Scotland until the wind-up of the Association last year.

The directors of Chubb and Son's Lock and Safe Company are contemplating a new departure in their lock manufactory at Wolverhampton. Failing to secure the freehold of their Horseley Fields works, the company has now bought from the corporation a freehold plot close to the corner where Railway-street and the approach to the high-level station joins. This new building will be constructed in parts. The first part, which will be commenced during the present year, will face Railway-street, and will be a structure of four or five stories.

The Brighton Town Council resolved on Friday to reduce the price of electricity to 7d. per unit for the first hour and 1½d. afterwards. It is claimed that this is the lowest rate of supply in England, making the current as cheap for all purposes as gas.

The death is announced of Mr. G. H. Edwards, who was for some years a member of the Gloucester City Council, and subsequently an alderman. The deceased, who was formerly in the timber trade, retired a few years ago, and lived at Churchdown, midway between Gloucester and Cheltenham. He was in his 79th year.

On Saturday Messrs. Christie, Manson, and Woods, London, sold a collection of sixty-five pictures belonging to the late Baron de Hirsch. The collection realised nearly £7,000. A Vanduyck fetched 1,600 guineas, and a Gainsborough 700 guineas.

## Trade News.

## WAGES MOVEMENTS.

AMALGAMATED CARPENTERS AND JOINERS.—In his February report to the members of this society, Mr. F. Chandler, of Manchester, the general secretary, writes:—"With regard to the special investigation which is taking place in all branch accounts, members will be interested to know that the reports from 119 branches in the United Kingdom show 62 good, 42 fair, and 15 bad; but one feature which stands out more prominently than any other in connection with these audits is the almost general omission to impose the 3d. fine for six weeks' arrears, as even in branches where all other provisions of our rules are observed this is neglected, which necessarily involves a great loss of income to our society. It would be a very modest estimate to assume that there would be in, say, 700 branches, on an average, at least eleven members escape this fine each quarter who according to rule should have paid it, representing a loss of £385 annually, or more than sufficient to pay the whole of our general office staff. Another serious dereliction of duty disclosed is in regard to keeping members on the books after their arrears have exceeded the limit of 26 weeks, the result being that many of our members have acquired the habit of paying their contributions in sums ranging from 20s. to 30s., thus causing them to be in a perpetual state of suspension from benefits."

CARDIFF AND BARRY.—The strike of 2,500 dock labourers, painters, &c., at Cardiff and Barry, after lasting about a week, has been terminated. The employers have virtually conceded the men's demand, the 6d. per day being gained. The men started work on Tuesday on the 3d. advance, and the other 3d. will be added on and after the 1st of April.

IPSWICH.—A dispute has arisen between the plasterers and bricklayers, the former contending that the bricklayers have been taking work which properly belonged to plasterers. The local branch of the Plasterers' Society sent notice to employers that they could not in future work for firms who engaged bricklayers to do plastering. This the employers (as represented by the Master Builders' Association) refused to submit to, and the result, after fruitless negotiations, was that the plasterers struck on all jobs carried on by members of the Master Builders' Association.

The Leeds Church Extension Society have secured a site for the erection of a new church on the Victoria Park estate, Kirkstall, containing 3,271 yards, at a cost of £450. It is situated about the centre of this estate, which is laid out for the erection of 550 houses in pairs and 250 in terraces. Nothing but through houses are to be built.

On Saturday evening the Mayoress of Cheltenham switched on the arc lamps which have been placed in the High-street, Clarence-street, and St. George's-place, as a first instalment of the public lighting of that borough by electricity.

The water committee of the Sheffield Corporation have recommended the council to appoint Mr. William Watts, water engineer under the Oldham Corporation, as resident engineer to carry out the work of constructing a new reservoir at Langsett in connection with the extension of the Sheffield waterworks system. The salary is £1,200 per annum.

The forthcoming loan exhibition at the City Art Gallery promises to be even more attractive than its predecessor. The President and Council of the Royal Academy have promised to lend Mr. F. Bramley's work, "A Hopeless Dawn," now included in the Chantrey collection. The corporations of Manchester, Liverpool, Leeds, and Birmingham will also be represented by some fine examples. The Earl of Wharfedale has consented to lend his "King Cophetua," by Burne-Jones. Structural alterations are now being carried out at the southern end of the large gallery, with a view to giving an extra 70ft. of wall space and improving the appearance of the gallery.

A parish meeting was held at the town hall, Upton-on-Severn, on Wednesday week, for the purpose of considering what should be done with the old church, which has now been disused for fourteen years, and is rapidly going to decay. A resolution was proposed asking that a faculty be obtained, and the church taken down, leaving the tower only. Mr. J. R. Clarke seconded the resolution. An amendment was moved that a committee be appointed to decide upon the necessary repairs, and to get estimates from local builders for the work to be done, and to report to a future meeting of the parish. The amendment was carried by an overwhelming majority. It was subsequently agreed that a committee be appointed to examine the building and to get estimates of local builders as to the cost of restoration.

## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6	to £6 0 0
Rolled-Steel Joists, English.....	6 0 0	to 6 10 0
Wrought-Iron Girder Plates.....	6 15 0	to 7 15 0
Bar Iron, good Staffs.....	7 0 0	to 8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0	to 17 10 0
Do., Welsh.....	5 15 0	to 5 17 6

## Boiler Plates, Iron—

South Staffs.....	7 17 6	to 8 0 0
Best Snedshill.....	10 0 0	to 10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

## Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	to £11 0 0
Best ditto.....	11 5 0	to 11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0	to £8 10 0
Cast-Iron Stanchions.....	6 0 0	to 8 10 0
Cast-Iron Sash Weights.....	—	to 4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0	to 5 15 0
4in. to 6in.....	5 5 0	to 5 10 0
7in. to 24in. (all sizes).....	4 15 0	to 5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

	Per ton.
Pig Iron—	
Cold Blast, Lilleshall.....	105s. to 110s.
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.

## Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

	75p.c. Fittings 77p.c.
Gas-Tubes.....	70
Water-Tubes.....	72
Steam-Tubes.....	65
Galvanised Gas-Tubes.....	62
Galvanised Water-Tubes.....	55
Galvanised Steam-Tubes.....	45

	10cwt. casks.	5cwt. casks.
Sheet Zinc, for roofing and working up.....	£22 15 0	to £23 15 0
Sheet Lead, 8lb. per sq. ft. super.....	13 17 6	to 14 17 6
Pig Lead, in 1cwt. pigs.....	13 5 0	to 14 5 0
Lead Shot, in 28lb. bags.....	16 5 0	to 17 5 0
Copper Sheets, sheathing and rods.....	63 0 0	to 65 0 0
Copper, British Cake and Ingot.....	53 0 0	to 53 10 0
Tin, Straits.....	62 12 6	to 63 12 6
Do., English Ingots.....	67 0 0	to 68 0 0
Spelter, Silesian.....	18 0 0	to 19 0 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£8 15 0	to 9 15 0
Cut Nail Brads.....	8 10 0	to 9 10 0

## Wire Nails (Points de Paris)—

	0 to 7	8	9	10	11	12	13	14	15	B.W.G.
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8/8 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9 per cwt.

## TIMBER.

Teak, Burmah.....per load	£13 10 0	to £16 0 0
" Bangkok.....	11 0 0	to 15 10 0
Quebec pine.....	2 0 0	to 4 0 0
" yellow.....	4 15 0	to 5 15 0
" Oak.....	3 10 0	to 5 5 0
" Birch.....	3 5 0	to 4 10 0
" Elm.....	2 10 0	to 3 15 0
" Ash.....	2 10 0	to 3 10 0
Dantsic and Memel Oak.....	2 10 0	to 4 10 0
Fir.....	2 10 0	to 4 15 0
Wainscot, Riga p. log.....	4 10 0	to 5 10 0
Lath, Dantsic, p.f.....	5 0 0	to 6 10 0
St. Petersburg.....	8 10 0	to 9 0 0
Greenheart.....	0 2 0	to 0 2 2
Sequoia, U.S.A. ....per cube foot	0 0 4	to 0 0 6
Mahogany, Cuba.....	0 0 4	to 0 0 5
" Honduras.....	0 0 4	to 0 0 5
Cedar, Cuba.....	0 0 3	to 0 0 7
" Honduras.....	0 0 3	to 0 0 7
Walnut, Italian.....	0 0 3	to 0 0 7

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in.—

Quebec, Pine, 1st.....	£21 0 0	to £23 10 0
" 2nd.....	15 0 0	to 17 0 0
" 3rd.....	7 10 0	to 11 0 0
Canada Spruce, 1st.....	9 0 0	to 10 10 0
" 2nd and 3rd.....	7 10 0	to 8 15 0
New Brunswick.....	7 5 0	to 7 15 0
Riga.....	7 0 0	to 8 0 0
St. Petersburg.....	9 0 0	to 13 0 0
Swedish.....	8 10 0	to 16 0 0
Finland.....	8 10 0	to 9 0 0
White Sea.....	10 0 0	to 16 10 0
Battens, all sorts.....	5 0 0	to 20 0 0

	per square of lin.	per square of lin.
1st prepared.....	0 9 6	to 0 16 6
2nd ditto.....	0 8 0	to 0 13 0
Other qualities.....	0 6 0	to 0 7 6

## Staves, per standard M:—

Quebec pipe.....	35 0 0	to 42 10 0
U.S. ditto.....	230 0 0	to 240 0 0
Memel, cr. pipe.....	200 0 0	to 210 0 0
Memel, brack.....	—	—

## OILS.

Linseed.....per ton	£15 10 0	to £16 2 6
Rapeseed, English pale.....	27 10 0	to 27 15 0
Do., brown.....	20 10 0	to 26 15 0
Cottonseed ref.....	15 10 0	to 16 0 0
Olive, Spanish.....	29 0 0	to 30 0 0
Seal, pale.....	23 0 0	to 24 0 0
Cocanut, Cochín.....	27 15 0	to 28 0 0
Do., Ceylon.....	23 10 0	to 23 12 6
Palm, Lagos.....	23 0 0	to 24 10 0
Oleine.....	19 0 0	to 20 0 0
Lubricating U.S.....per gal.	0 6 3	to 0 7 6
Do., black.....	0 4 9	to 0 6 6
Tar, Stockholm.....per barrel	1 0 0	to —
Archangel.....	0 12 6	to —
Turpentine, American... per ton	22 10 0	to 22 15 0



## LIST OF COMPETITIONS OPEN.

Folkestone—Fifty Working-Class Houses, East Cliff	£10	W. G. S. Harrison, Town Clerk, 4, Cheriton-place, Folkestone	Feb. 13
Dudley—Grammar School and Master's House	£50, £30	Albert Morton, Clerk to Governors, 15, Birmingham-road, Dudley	" 15
London—Convalescent Fever Hospital	£150, £100, £50	T. D. Mann, Clerk to Met. Asy. Board, Norfolk-st., Strand, W.C.	" 22
Felixstowe—Laying-out (Cliffs and Erecting Buildings)	£50, £15	Jennings and Haward, Felixstowe	Mar. 1
Enniskillen—Town Hall (£7,500 limit)	£50, £20, £10	Thomas Elliott, Borough Surveyor, Enniskillen	" 20
Christiania—Railway Terminal Station Plans	£555 10s., £222 4s. 6d., £111 2s. 3d., 55s 11s.	Railway Offices, 6, Victoria-terrace, Christiania	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Washington Browne, A.R.S.A., Edinburgh, Assessor)	£100 (merged in 4 per cent.), £50, £25	A. Macdonald, Town Clerk, Hillock House, Govan	" 31
Guernsey—States Assembly Hall (£15,000 limit)	£100, £50	N. Domaille, Supervisor of Harbour, States Offices, Guernsey	April 17
Elne, France—Water Supply Scheme (3,300 inhabitants)		La Marie, Elne, Pyrénées Orientales	July 1
London—Electric Omnibus and Cab Designs	£150, in three premiums	Sec., London Electric Omnibus Co., 6, Northumberland-av., W.C.	—
Bolton—Fire Station (£12,000 limit, local architects only)	£50, £20	R. Gudgeon Hinnell, Town Clerk, Bolton	—
Nuneaton—Conservative Club (£3,000 limit)	30s.	J. H. Bland, Solicitor, Nuneaton	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Shipley, Yorks—Wool Combing Works	County Police Committee	Walker and Collinson, Architects, 227, Swan Arcade, Bradford	Feb. 13
Barrowford, Nelson—Police Station	A. C. Jupp	H. Littler, Architect, 21, Pitt-street, Preston	" 13
Gorleston—Two Houses on the Cliff	School Board	W. B. Cockrill, Architect, Gorleston, Yarmouth	" 13
Fowey—Boys' School	School Board	W. J. Graham, Clerk, Fore-street, Fowey	" 13
Shipley—Wool Combing Works	School Board	Walker and Collinson, Architects, 227, Swan Arcade, Bradford	" 13
Sheffield—Additions Springside School	Coventry Corporation	C. J. Innocent, Architect, 17, George-street, Sheffield	" 13
Pinley—Small-pox Hospital	Committee	G. and I. Steane, Architects, Little Park-street, Coventry	" 13
Cesarea—Three Houses	Proprietors of Distillery	C. J. Roberts, Bedford, Upper Llandwrog	" 13
Longmorn—Houses, Offices, and Cottages	Corporation	C. C. Doig, architect, Elgin	" 13
Glasgow—Dressing-Boxes at Baths	Llanbadarn School Board	J. Lindsay, Interim Clerk, City Chambers, Glasgow	" 13
Cwmpadarn—School	H. Roberts, Penzance	H. G. Atwood, Clerk, 1, Baker-street, Aberystwith	" 13
Gulval, Cornwall—Villa	Gelligaer School Board	Oliver Caldwell, F.R.I.B.A., Penzance	" 14
Gilfachfargood—School		F. T. James, Clerk, 134, High-street, Merthyr Tydfil	" 15
Ramelton—Schoolhouse	Asylums Corporation	Rev. Thomas Slaven, P.P., Ramelton	" 15
Selside, Kendal—Schools	Aberstruth School Board	John Hutton, M.S.A., Kendal	" 15
Steeple Gidding—Farmhouse	Aberstruth School Board	Noel Villiers, 15, Great George-street, Westminster	" 15
Aberdeen—Additions to Branch Lunatic Asylum	Committee	G. Taylor, Clerk of Works, Aberdeen Asylum	" 15
Cwmillery—School (200 places)	Blackley Moor Co-operative Society	J. A. Jones, Clerk, Blaiza, Mon.	" 15
Nantyglo—Additions to School	Baths Committee	J. A. Jones, Clerk, Blaiza, Mon.	" 15
Halifax—Liberal Club, Lee Mount	Corporation	Medley Hall, Architect, 29, Northgate, Halifax	" 15
Blackburn—Shop in Simons-street	County Brewery	Simpson and Duckworth, Architects, Blackburn	" 15
Stockport—Turkish Bath Extension	School Board	J. Atkinson, Borough Surveyor, St. Peter's-gate, Stockport	" 15
Selside—Schools	Board of Guardians	John Hutton, F.S.I., Kendal	" 15
Workington—Slatting, &c., Fever Hospital	Horse Show Society	J. Warwick, Town Clerk, Workington	" 15
Cadoxton—Hotel	Urban District Council	W. Hancock and Co., County Brewery, Cardiff	" 15
Belmont—School (235 places)	Urban District Council	Bradshaw and Gass, Architects, Silverwell-street, Bolton	" 15
Blaydon-on-Tyne—Rebuilding Station Hotel, House, and Shop	Rhondda Breweries Co.	T. C. Nicholson, F.R.I.B.A., Blaydon-on-Tyne	" 16
Orpington—Additions, Chislehurst-road Schools	U.D. School Board	G. Wall, Clerk, Haxstead-road, Bromley	" 16
Ashton-under-Lyme—Workhouse Extension	Governors	B. Seymour, Clerk, Stamford-street, Ashton	" 16
Exeter—Exhibition Yard	Alfred Pope	A. W. Buckingham, Hon. Sec., 12, Southernhay, Exeter	" 16
Brentford—Fire Station, High-street	Colliery Company	Stephen Woodbridge, Clerk, Brentford	" 16
Brentford—Mortuary, Town Meadow	Miskin Building Club	Stephen Woodbridge, Clerk, Brentford	" 16
Pontypridd—Additions to Castle Inn	Board of Guardians	W. R. Davies, Secretary, 10, Westgate-street, Cardiff	" 16
Uxbridge—Alterations, Providence Chapel	Rev. S. Meade	W. L. Eves, 54, High-street, Uxbridge	" 17
Aberayron—Enlargement of Congregational Chapel	Directors	Rev. T. Gwilym Evans, Aberayron, Wales	" 17
Falmouth—Boys' School, Wellington-terrace	Jas. Fry	W. Jenkins, Clerk, Falmouth	" 17
Aberthillery—Intermediate Schools	Scottish Provident Institution	Swash and Bain, Architects, 3, Friars Chambers, Newport, Mon.	" 17
Stratton—Two Pairs of Semi-Detached Cottages	Harbour Trust	A. L. T. Tilley, Architect, 10, Cornhill, Dorchester	" 17
Shirebrook—Two Hundred Houses	Boyd Endowment Trustees	Secretary, Shirebrook Colliery Company, Mansfield	" 17
Miskin, Mountain Ash—Fifty Cottages	Board of Guardians	T. Richards, Secretary, 1, Fourdy-terrace, Mountain Ash	" 17
Fishguard—House	John Bird	E. Collier, M.S.A., 4, Quay-street, Carmarthen	" 17
Dewsbury—Enlargement, Trinity Congregational Church	Lancashire Asylums Board	J. Kirk and Sons, Architects, Dewsbury	" 17
Carlisle—Two Houses, Warwick-road	Trustees	W. Batey, Crescent Joinery Works, Carlisle	" 18
Kinsale—Workhouse Additions	Commissioners	R. Evans, C.E., 53, South Mall, Cork	" 18
Langley Moor—House	Household Furnishing Co.	Geo. Rhymer, Tudhoe Colliery, Co. Durham	" 18
Kendal—Shops and Cottages	Duke of Bedford	John Stalker, M.S.A., Kendal	" 18
Crewe—Rebuilding Unionist Club, Edleston-road	Duke of Bedford	J. F. Marsden, Secretary, 139, Walthall-street, Crewe	" 18
Tintagel—Alterations, Private Hotel	Duke of Bedford	Wise and Wise, Llancaeron	" 18
Belfast—Clearing Site, Donegall-square, West	Committee	E. G. MacGeorge, Local Secretary, 10, Donegall-square, N., Belfast	" 18
Swansea—Timber Stage	French Government	Talfourd Strick, Clerk, Harbour Offices, Swansea	" 19
Belfast—Schools, Ravenhill-road	Building Committee	Young and Mackenzie, Architects, Donegall-square, Belfast	" 19
Celbridge—Three Labourers' Cottages	Society Marie Reparatrice	S. Manning, Sanitary Offices, Celbridge, Ireland	" 19
Combs—Six Cottages, Needham-road		H. G. Bishop, M.S.A., Market-place, Stowmarket	" 19
Rainhill—Additions to Wards, County Asylum		Jas. Gornall, Acting Clerk, Rainhill Asylum	" 19
Cork—Alterations, Wesley Chapel, Patrick-street		Robt. Walker, J.P., P.S.A., 17, South Mall, Cork	" 19
Paisley—Fire-Engine Station, Johnstone-street		T. Walker, Clerk, Municipal Buildings, Paisley	" 19
Newcastle-on-Tyne—Warehouses, Strawberry-place		Offices of Company, Strawberry-place, Newcastle	" 20
North Petherton—Cottages		The Steward, the Bedford Office, Tavistock	" 20
Maxworthy—Two Cottages		The Steward, the Bedford Office, Tavistock	" 20
Hellescott—Cottage		The Steward, the Bedford Office, Tavistock	" 20
Cockermouth—Lodge and Museum, FitzPark		Thos. Bakewell, Secretary, Cockermouth	" 20
Cannes—Post and Telegraph Office		The Mairie, Cannes, Alpes Maritimes	" 20
Windsor—Additions to Albert Institute		Secretary, Albert Institute, Windsor	" 20
Limerick—Additions to Convent		W. E. Corbett, M.R.I.A.I., 25, Gentworth-street, Limerick	" 20
Kendal—Extensions, Netherfield Works		Robert Walker, F.R.I.B.A., Windermere	" 20
Brentwood—Improvements to Congregational Chapel		Chas. Pertwee, F.R.I.B.A., Bank Chambers, Chelmsford	" 20
Bath—Shop and Stores, Piccadilly		H. Hookway, Solicitor, 15, Old Bond-street, Bath	" 20
Bristol—School, Fairfield-road		W. L. Bernard, F.R.I.B.A., 3, St. Stephen's Chambers, Bristol	" 22
Langthorpe—Four Cottages		Seth Shaw, Clerk, Langthorpe, Boroughbridge	" 22
Falmouth—Church Restoration		Edmund Sedding, Architect, Plymouth	" 22
Walthamstow—Schools, Wood-street		T. W. Liddiard, High-street, Walthamstow	" 23
Athy, Ireland—Dispersary House at Castledermot		T. P. Orford, Clerk, Workhouse, Athy	" 24
St. Helen's Lanes—Sanatorium		G. J. C. Broome, Borough Engineer, St. Helen's	" 24
Britford—Shed near Workhouse		F. Holding, Clerk, Market House Chambers, Salisbury	" 24
Rotherham—Public Swimming-Bath		H. H. Hickmott, Town Clerk, Rotherham	" 24
Dewsbury—Hoist and Covered Way		Holton and Fox, Architects, Westgate, Dewsbury	" 24
Mickleover—Enlargement of Lunatic Asylum		B. Scott Currey, St. Michael's-churchyard, Derby	" 26
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Walthamstow—Boiler House, Low Hall Sewage Works		E. J. Gowen, Clerk, Town Hall, Walthamstow	" 26
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Faughan—Renovation, Presbyterian Church		Wm. Barker, Architect, 25, Orchard-street, Londonderry	" 27
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Sheffield—Retort House and Coal Stores		Hanbury Thomas, Manager, Commercial-street, Sheffield	" 27
Newport, Mon.—Eisteddfod Pavilion in Cattle Market		T. L. Evans, Hon. Sec., 3, Commercial-street, Newport, Mon.	Mar. 1
Culnington—Church Tower Restoration		Rev. D. E. Holland, Culmington Rectory, Salop	" 1
Londonderry—Additions, County-Court House		A. C. Adair, Architect, Londonderry	" 1
Canterbury—Beane Institute and Library		H. Fielding, Town Clerk, 15, Burgate-street, Canterbury	" 1
Horton, Surrey—Foundations of County Lunatic Asylum		R. W. Partridge, Clerk, 21, Whitehall-place, S.W.	" 1
Rotherham—Four Almshouses		J. E. Knight, Moorgate-street, Rotherham	" 2
Southend Pier—Winter Garden		W. Gregson, Town Clerk, Southend-on-Sea	" 3
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FROM THE COLLECTION OF M<sup>S</sup> W. J. OLDRIEVE

BRAMHALL HALL CHESHIRE



FEB 12, 1897.



"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

THE DINING HALL AFTER J. NASH















"THE ARK OF THE COVENANT"

STAMFORD HILL, N.

MESSRS JOSEPH MORRISON ARCHT

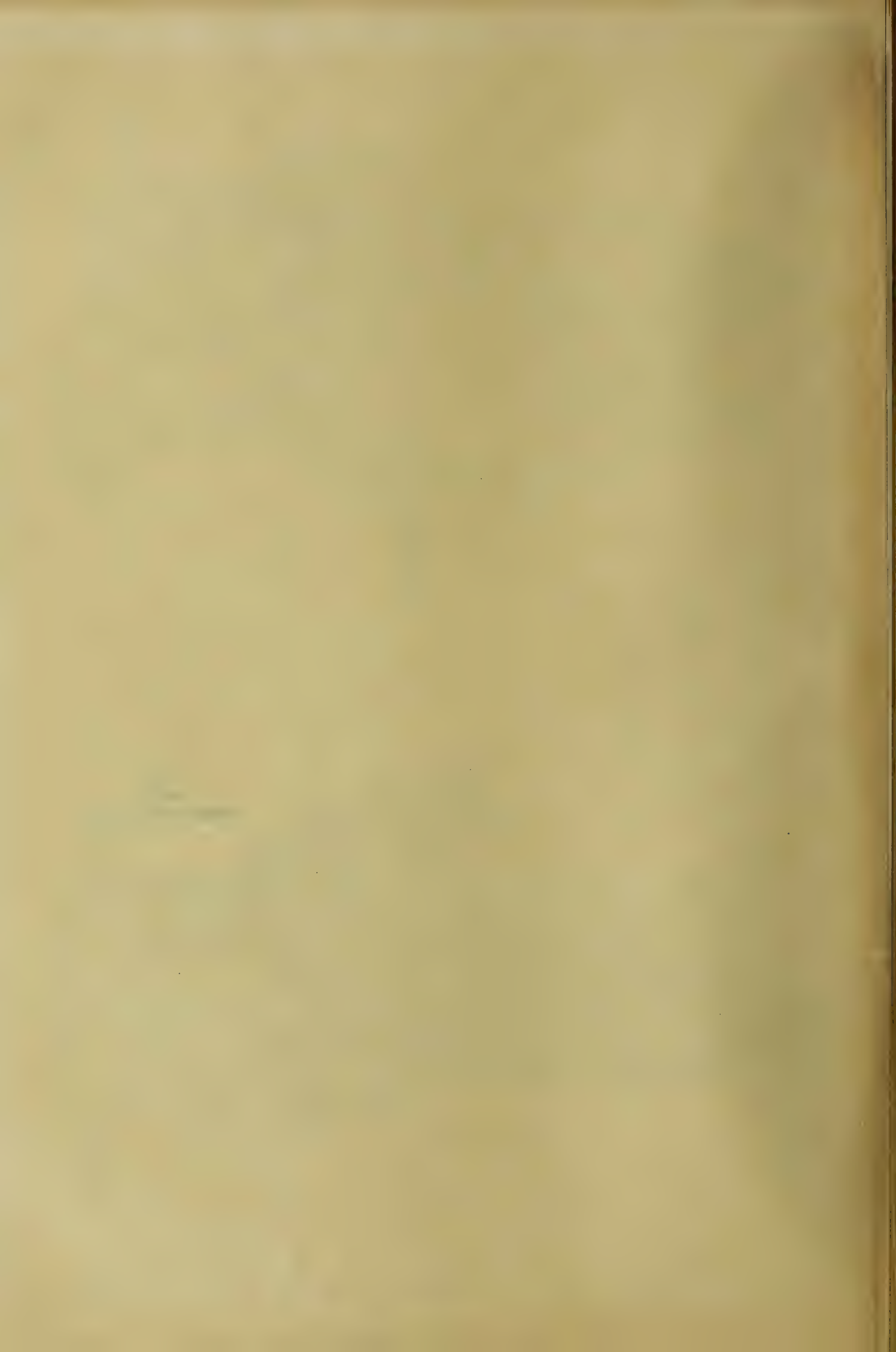


A G WALKER SCULPTOR



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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### SPECIAL DEVELOPMENTS.

**P**ROFESSIONAL practice is no longer as it was early in the century—a matter of simple building operations confined to the traditional trades, and controlled by ordinary plans and workmen. A number of extra demands are made on the architect, the character and extent of which may be gathered from the construction and use of many modern buildings. The modern price-book, when compared with one of the earlier editions, shows how many of the trades have become specialised and divided into branches, and the number of new trades that have been added. Even the bricklaying trade has been split up into several kinds of work—brick ornament, terracotta work, marble and mosaic paving, tile-work, and sanitary fittings; the joiner has several special branches, like wood-block and parquet flooring and machine-made goods.

A glance through any modern specification or builder's price-book will reveal a number of miscellaneous trades and specialties which are of comparatively modern growth, that lie outside the domain of building. Many of them are subjects which have been called into requisition by the progress of modern science and invention, and which have a bearing on architecture and an interest for the profession, mainly because they have a tendency to encroach upon the sphere of the architect, to restrict his design and interfere with his arrangements. They are not essentially architectural accretions; they are rather of a disintegrative nature, tending more to destroy union than to create it. At present, at least, some of these branches are practised by men who have made them special industries, and who have a personal interest in promoting them, and they not unnaturally come often into conflict with architects, by ignoring altogether those traditions of the art which the profession hold in reverence. May we not point to the engineer of iron construction, the heating and ventilating specialist, the electric-lighting engineer, and even the plumber, each and all of whom have become more and more distinct trades? Their independence of action has in it an element of danger, for this sort of thing might go on unchecked till the time arrived when a building became to be regarded as the product of a number of trades in which architectural skill would be underrated. We might imagine a building owner calling in a draughtsman to make his plans and elevations, a builder to contract for the mere shell, and then hand over the work to a number of separate tradesmen to carry out the sanitary plumbing, heating, electric lighting, and decoration of the building. To a certain extent the building art has come to this in particular branches of commercial building; indeed, in America it is not uncommon for one large building to be undertaken by several contractors, over whom the architect exercises a very perfunctory control.

The experience of many architects is that they do not get exactly what they want or expect from those who execute certain trades in a building. The specification may be full and explicit; it may contain all the usual clauses, but it fails in some point because the author has not taken into consideration the mode of working or some detail of workshop practice. Architects, for example, do not seem exactly to understand what they should specify for constructional ironwork. Take an ordinary cast-iron column: the clause contains a general reference to the height and diameter, thickness of cap, the base

attachments, thickness of metal if hollow; but perhaps nothing is said about the necessity of having the hollow columns cast true in thickness all round, so as to avoid unequal stress—in other words, that the "core" in casting must be fixed accurately in the centre. Very often an unequal pressure is set up in consequence. Does the clause insist on details such as turning the ends of columns or stanchions, accurate fixing and seating at the base, the chamfering of the edges of cap-plate so as to avoid the column taking the bearing on its outer edge? The last item is seldom enforced in the specification, and the result is that the load is thrown on one side of the column, and its effective strength much impaired. A serious collapse of a steel-framed building lately took place from this cause. But cast iron-work is sure to go wrong if the details of connections, those points which show the architect's design, are not looked after. For this purpose the architect and pattern-maker should work together when there are ornamental capitals and bases or other features, like spandrels, to be executed. The stock patterns of great ironfounders are too often thrust upon the building, simply because the specification has been couched in too general terms, and no details have been supplied. The architect is angry and disgusted to see some vulgarised "Classical" or Gothicised capital introduced, or a pattern used which is commonplace. The ironfounder and builder no doubt prefer that the moulder should provide his own patterns; and even a well-known handbook suggests that it is better for the founder to provide his own patterns, as the architect's designs will, in all probability, have to undergo alterations before they can be passed into the moulder's hands. No doubt; but why? Because the architect knows nothing of pattern-making, nothing of such points as the allowance to be made for contraction, which varies with the shape and size of the casting, the strains due to shrinkage owing to irregular thicknesses. A column with mouldings cast on it is subject to uneven contraction, and it is better that mouldings should be bolted on, a rule that should be observed in ornamental capitals. How many architects make the mistake of designing details with deep undercuttings, or shape their work so that it cannot draw clear out of the sand? In these cases it is obvious that separate pieces are desirable which can be held together by pins. All internal angles cause cracks, and should be rounded off; a cast-iron frame will open at the angle as the metal cools. For columns, vertical casting ought to be required, if the weakness due to bubbles on one side of the casting is to be avoided, as it is well known that columns cast in the horizontal position are weaker on the upper side, and after their loading compress more one side than the other. If architects took care to make their drawings for the founder's shop according to the pattern-maker's rules for shrinkage, we should see less bungling; but every dimension for length and thickness should be figured on the drawings.

Why are the joinery fittings of commercial houses, banks, restaurant bars so atrociously out of "key" with the architect's building? Is it not because he hands over the whole work to shop-fitters and furnishers? The profession have themselves to blame for permitting these things to pass out of their hands. The manufacturer now deals with them as his own; he has studied the requirements of counters and wall fittings for banks, offices, shops, and buffets, and is prepared to contract for them, and if need be to design them and write specifications. In the meantime all architects' ideas are disregarded; it is a special contract in which the employer himself is most concerned. And the same with church fittings, which are made and fixed by men who have specially devoted

themselves to ecclesiastical furnishing whom the average architect specifies. Happily in this branch the "commercial" expert has not got it all his own way; architects there are who now insist on supplying their own designs and details for open benches, choir-stalls, lecterns, and pulpits, and would no more think of adopting an ecclesiastical furnisher's designs for altar furniture, reredos, or chancel screen than they would intrust a mason with the design of a traceried window or tower. There would have been few commercial manufacturing specialists of the "illustrated-catalogue" type, if men like Street or Sedding or Bodley and Garner were more numerous. Instead, there would have been the art-craftsman, who would have executed the work from the architect's drawings, unfettered by any trade consideration. Such a state of things is not to be yet—not, at least, until the conditions of craftsmanship are again in operation. To a great extent, mechanical labour and reproduction to satisfy the demand for cheapness have been the causes. Machine-made mouldings, fretsaw ornamentation, turned and stamped work are the chief kinds of workmanship one sees in the ornamental joinery of the contracting fitter. The same with ornamental tile work or faience decoration. The architect simply specifies the name of the manufacturer; but how often does he furnish a drawing of the scheme, or the designs to be painted? With stained or painted glass, the design or cartoon, if one is made, is left to be carried out by the glass artist, who is at liberty to alter the design, sometimes for the best, but at other times because the architect's sketch would entail a more costly execution. Unless the designer of a window knows something of "fretwork" or the leaden outline work, as practised during the best ages, he may make a design that cannot be executed, and it is this technical knowledge of lead for mosaic-work windows which is a bar to the ordinary architect's design being carried out. It will be argued that an architect has not the opportunity or time left from his pressing business duties to learn the technical processes and details of trade, and therefore he is obliged to rely on the skill of the special manufacturer. No doubt he is to a large degree; but at least he ought to know what are the limitations of the material he is about to use—the limitation, that is, of design or pattern—and what are the methods used by the craftsman in the execution of his work. In these matters the specification is only useful to describe quality and modes of workmanship; a great deal must be left to the working drawings.

The pressing question is, How are these to be prepared for such a class of work as we have supposed? An architect goes to his client and asks him how he wishes his business premises fitted up; he simply gets a general reply; but he is still unable to understand the details and intricacies of the fittings suitable, say, for a large restaurant or chemist's establishment. The expert fitter of these things would have the advantage. Or let us suppose a specification and details are required for ironwork, say the roof of a market or botanic house, the architect should be competent to design and prepare the drawings for such a building, and to write a general specification; but how is he to do so without a practical acquaintance with the qualities of iron, the marketable sections and workshop practice, to say nothing of the mode of calculating the stresses, which he may probably understand? Theoretical knowledge, calculation of stresses are learned from classes and books; but, as every practising architect knows, this knowledge, useful as it is, fails him in the hour of need. He wants to know what kind of "pig" iron is to be specified, or what mixture of "pigs" according to number ought to be used for the castings;



what kind of rivet or plate iron is necessary, whether it should be Yorkshire or Staffordshire plate-iron, and what tests should be specified to cover defects of iron or workmanship. The young practitioner soon discovers it is to the workshop rather than the treatise he must go for this purpose. The technical school building presents another trying ordeal for the inexperienced. The plan and design may be perfect; but how to specify such things as the joinery and fittings of classrooms, laboratories, and their many details of desks, tables, cupboards, extract flues, and other apparatus for chemical or physical science students is puzzling, and may seriously delay the working drawings and specifications. Except those who have special experience in baths and washhouse construction, very few are able to write full specifications of the engineering work, and the same difficulty is experienced in stable and farm buildings. Electric light specifications are generally very inadequate, and few architects can tackle the requirements of heating and ventilating arrangements or special plumbing work. Any attempt to write a specification for one of these things from a superficial knowledge of them or from books may lead to mistake. What, then, are the sources open to the architect? The technical science class is not open to him, even if it afforded the kind of information, which it does not. He requires first a practical building museum where may be found a collection of the special branches and trades. Not simply a museum; but one in which the requirements of such details as we have mentioned—iron construction in its many forms, fittings to buildings for various purposes, baths and washhouses, heating, electric-lighting, and other matters—are described and illustrated by models or specimens. A good building trades' exhibition, such as that to be shortly opened at the Royal Agricultural Hall, arranged on professional lines, may be made a very useful means of disseminating views between makers and inventors and the building profession. A second requirement is the workshop, presided over by experts in the several trades, where actual work is being executed by skilled craftsmen. We do not mean the "academic" workshop of the technical school, valuable as it is for students; but workshops established by the municipality of a great city, where the architect who is preparing special designs can go for advice and instruction. For these practical auxiliaries our professional men will, no doubt, have to wait; but they must come if England is to keep pace with other European countries.

#### MEASUREMENT OF WORK.

THOSE who are engaged in building operations in different parts of the country are often puzzled by the diversity in the modes of measurement of materials and labour. The consequence of such divergence of practice is that difficulties arise when quantities are prepared in London for buildings in, say, Yorkshire or Lancashire, or when certain trades have to be measured up. The Northern practice of obtaining separate tenders for each trade is so interwoven with the modes of measurement adopted, that any alteration of the existing methods is not possible. Bricksetters and masons have been accustomed to be paid for their labour according to certain methods or by a certain unit, and it will be a long time before they can be induced to agree to any more general or rational method. The mind of a practical building artificer is slow to accommodate itself to any new method of calculating his labour, and this fact must be taken into account. Those engaged in London practice cannot quite understand why the building trades in Lancashire reduce their brickwork to the yard superficial of one brick thick; but as a matter of measuring, we are not quite sure that

the use of this standard in the North is not justified. Our unit of measurement—namely, a rod, or 272ft. superficial of one-and-a-half brick thickness—no doubt saves labour in large buildings, though the reduction of all thicknesses of walling to one-and-a-half brick necessitates a rather troublesome process of multiplication and division in some cases. The yard superficial of one brick thick has at least the advantage of being simple for small works, and the bricklayer can more readily grasp the yard than the rod.

But it may be worth while just to describe more precisely the mode of measuring adopted in the North compared with that of the Metropolis, and for this purpose we quote from a price-book used by the builders in the North, based on the recommendations of the Manchester Society of Architects and the master builders of Yorkshire. Taking the bricksetter, the following clauses of these recommendations will explain themselves:—“(1) Give description of materials and mortar, and quality of work. The work, unless otherwise mentioned, to be reduced to one brick thick, and called ‘Brick Length Walling’ in yards superficial; or, better still, give the various thicknesses separately, as it is obvious the labour is proportionately more on thin walls than on thick.” (2) To obviate any misunderstanding as to so-called trade usages, with regard to other materials, as stone, &c., built in, it is proposed to measure the net quantity of brickwork to be executed, deducting entirely all labour and material in openings having more than 100sq. ft. ‘face’ measure. (3) Materials only are to be deducted (leaving hollows) for labour on all other openings less than 100sq. ft., as above, outer face only, provided they are openings in the walls, and built above with the same materials. (4) The lineal dimensions of flues (with size, if various) to be given for extra labour forming and pointing, &c. These clauses are sufficient to show the difference of usage between the Northern and Metropolitan modes of measuring brickwork. These rules are reasonable as regards openings in walls. The deductions to be made of the clear external aperture only. In London the “labour to openings” is generally made an item in feet superficial; in the North the “labour only” is taken for openings under 100ft. super. But surveyors often vary as to their method of measuring openings, and the price-books themselves describe different methods. Surveyors, in making their bills of quantities, sometimes make an item for “labour to openings,” at other times they do not, and a similar diversity of practice follows in measuring work. We consider what is reasonable ought to be followed. Let us take two walls, one full of openings and piers, and the other plain and solid. Is it reasonable to say that the labour on both is the same? Surely not; the idea is too absurd to be entertained. The extra labour in forming piers ought to be paid for at a different rate to the labour on the plain solid work. Some surveyors estimate the difference by taking the reveals and quoins at something like 1½d. per foot run for ordinary walls; others collect all the openings as an item, pricing them at 10s. per rod. The first is perhaps the better way. It would be a good thing if measuring and quantity surveyors agreed to one system of taking openings, as we believe many tenders for large brick buildings vary much from this cause. Another remark on the Manchester rules is the mode of measuring flues; the labour, forming, and pointing, is locally measured by the foot lineal, deducting the brickwork. In London flues are measured solid, chimney openings being deducted. On the whole, the Metropolitan method is the easier, and fairly allows for labour in forming and pargetting. But one authority whose price-book we have quoted, Mr. R. Beckett, follows the Southern plan in making no deduction for flues. In the measuring of

“facing,” the Northern practice is to measure superficial for extra price over common, the net quantity executed being taken, deducting all strings and sills, &c. Here, again, all openings less than 100ft. super to be deducted and kept separate as “hollows for extra labour over common work,” a plan which is unknown in London.

We have confined our remarks to one, and a very important, item—that of brickwork; but anyone who compares the methods of measuring in other trades will find similar diversities. Thus, in the Manchester rules for masons, it is stated that “1in. each way beyond the net dimensions of each block of stone where worked is to be added, except plain ashlar walling,” a custom unknown in other parts. Again, in London, it is usual only to give the heights for hoisting; but in the North appliances for hoisting, like travelling cranes, are named. In the Metropolis, also, it is unusual for “labour and nails” in carpenter and joiners’ work to be measured or taken in bills of quantities; but the custom seems to be universal in the North to measure “labour framing and nails” superficially in square yards for floors of roofs, &c., keeping the different kinds of flooring, &c., separate. It is needless to multiply examples of other trades. In a few of the Manchester rules the methods are good, and approve themselves to all skilled artificers—“labour” seems to be more carefully considered than with us; in other respects the London practice appear to be more simple and expeditious. Between the practice of towns like Manchester and Leeds, or generally between Lancashire and Yorkshire, the methods of taking off quantities vary, and one of our correspondents last week draws attention to the difference of measuring brickwork found in these two counties. He says the brickwork in Yorkshire “is probably measured by the rod of 63ft. super. of 9in. walling, and openings under a certain width or area are not deducted.” Other trade differences are met with, and our correspondent asks for information on the points of difference in the mode of taking off quantities practised in the Yorkshire towns and in London. The question is of general interest to the profession, and it would help in the solution of the differences if the methods followed in various parts of the country were better known. The London practice and the price-books published here have no value in the provinces, where the modes of measurement and prices differ so widely. We believe that some years ago, at a meeting of the Associated Builders, it was proposed to publish a provincial price-book. Prices of materials and labour will always vary in different parts of the country owing to discrepancies in rates of wages and of carriage; but a greater uniformity in the modes of measuring work and pricing is much called for. Unfortunately, the rules and recommendations we have mentioned are not unanimously adopted even in the Northern provinces. Surveyors and builders still adhere to old traditional rules of measuring and pricing, the result of which is that correct rendering cannot be attained. Prices can only be fairly obtained in any trade by adopting a standard of rules and data. Cost of material, rate of wages, carriage, hoisting, and other incidental circumstances are absolutely necessary to be known before any builder can honestly give a price. A mode of measurement equally affects the result, as, for example, a tender based on the Lancashire method, estimating labour to openings, would work out differently to one in which the openings are not allowed for. With uniformity of measurement, haphazard tendering and wide guesses would be impossible.

New schools are being erected at Hornsey, and special consideration has been given to the ventilation, which will be carried out on the Boylston system.



## ADAPTABLE SPECIFICATIONS.—XXXI.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued.)

ONE of the most important of carpentry joints is that by means of which the foot of a principal rafter is framed into a tie-beam. It is very desirable that this joint should not be too complicated. Ingenious designs for it may be found in books on carpentry, old and new; but many of them require a minute accuracy in workmanship which cannot be obtained from the ordinary carpenter, and which, if it were obtainable, would prove needlessly expensive. What is wanted is to get the strongest practicable abutment for the end of the principal, and at the same time to prevent it from slipping sideways off the top of the tie-beam. The obvious way of getting abutment is to cut a V-shaped notch across the tie-beam, with the left-hand arm of the V at right angles to the slope of the principal rafter, and then to let the end of the principal into this notch. But it generally happens that if the notch were deep enough to receive the whole end of the principal, it would almost cut the tie-beam in two. Usually, therefore, the notch only goes far enough in to take half this depth; thus, if the principal is 10in. deep, the left-hand side of the V-shaped notch would measure 5in., and where the beam is very shallow, even this may be too much. If the notch is not deep enough, the bottom of the principal will be weak; and if, on the contrary, the notch is too deep, the tie-beam will be liable to fail. The thing to aim at is to keep them both equally strong. Then, again, this notch must not be too near the end of the beam, or the thrust of the principal rafter may push off that part of the beam against which it abuts. Supposing these three points attended to, there is still another to be considered. If the principal and the tie-beam were connected by a mere notch, and nothing else, it might happen in time, from the rocking action of the wind, or from structural pressures acting on one side of the principal rafter more than on the other side, that it would be pushed sideways out of the notch—at least, in part, if not altogether. To prevent this, the principal usually has a tenon on the end of it, in the middle of its thickness. This tenon should only be about  $\frac{1}{2}$  of the thickness of the rafter, and it fits into a mortise, which is cut in the tie-beam below the general surface of the notch. It should not, however, be tight on the bottom of the mortise, lest by inaccurate workmanship or subsequent settlement or shrinkage it should happen to take on itself the thrust of the principal. This should come on the square end of the principal, and not on the tenon, for while in theory it would be proper to divide it between them both in proportion to their strength, in practice no such equitable division can be made sure of.

A double notching of the principal into the tie-beam is sometimes adopted, and has the merit of cutting less into the latter than is necessary on the previous plan. Here two shallow V-notches are formed in it instead of one deep notch, and if the fitting were made and could be trusted always to remain absolutely perfect, this joint might often be preferable to that last described. But there is the same difficulty in dividing the thrust equally between the two notches which has just been shown to occur in dividing it between a single notch and a tenon. Sooner or later the tiebeam is pretty sure to push against one notch to the exclusion of the other, and not equally against both; and whenever this happens, the double notch, or "double shoulder," as carpenters call it, loses half its strength, and is liable to fail. This form of joint cannot, therefore, be recommended. When used, it requires, like the previous one, a tenon or some other contrivance, to prevent lateral slipping.

Instead of the central tenon in both the above-named joints, a central "bride" may be used. This amounts to tenoning the tiebeam into the principal rafter, instead of reversing the practice. The tie-beam has the notch first described; but this notch, instead of running right across it, is interrupted in the middle of the beam's thickness. The central fifth of the beam, in fact, goes through of the full depth, and a mortise to receive it is cut in the end of the principal. The notch in the tie-beam stops against each side of the central piece, being divided by it into two parts, each two-fifths, or thereabouts, of the entire thickness.

Where the tie-beam is very shallow, and there is a danger of weakening it too much by cutting a deep V into it for the principal to abut against, an artificial abutment may be made by bolting a short piece of wood on to the upper surface of the beam, between the end of it and the foot of the principal. Or the thrust of the principal may be taken by a wrought-iron "heel-strap," placed almost horizontally. The experienced carpenter will consider and provide for the effects of gradual shrinkage and of prolonged strain in his roofs, and will leave those parts of the joints a little open at first, which are sure in course of time to be brought more and more tightly to their bearings. He will also remember that timber yields much more easily to pressure at right angles to its fibres than to that which is applied against the ends of them, and will instinctively be guided, too, in all cases by the recollection that wood shrinks materially in breadth and thickness, but scarcely to any perceptible extent in length. For both these reasons he will expect the head of a king-post to "give" a little where it is pinched between the ends of the two principal rafters. By using a cast-iron king-head and a king-bolt instead of a king-post, this "giving" can be avoided. Where this is not practicable, means must be arranged from the first by which the tie-beam can be tightened up to the king-post, either by iron wedges in the suspending strap or by some similar contrivance.

The nuts of bolts and the wedges of straps should be placed where they will always be accessible. Roofs are often very hot places, sometimes through the action of the sun on the roof covering, sometimes, especially in public building, through the rise of hot air and combustion-products from below, and sometimes, and worst of all, through radiation from ventilating trunks proceeding from "sunlights" or similar sources of heat. Even the best timber will shrink considerably under these circumstances, and then, unless the joints are tightened up, not once only, but from time to time, thrusts on the walls and columns are likely to arise. This seldom seems to be foreseen. It is quite a matter of chance which end of his bolts the average carpenter puts within reach, and when they urgently want tightening, this is as likely as not to involve the removal of slates and boarding, or the use of ingenious and expensive methods for the purpose of reaching them.

Laminated ribs, if well made, will last, with but little change, for centuries. According to Professor Hosking, it is by means of them that the great dome at Sta. Maria della Salute, at Venice, was constructed in the 17th century. Each rib there is made of four thicknesses of board pinned together, and stepped at top and bottom into horizontal circular curbs. What wood they consist of is not stated. The boards which form ribs of this kind should be screwed, and not spiked together. Ribs of this sort are but little affected by shrinkage, as the ends of the boards abut against each other all round. In the 1862 Exhibition the annexe roofs, of 50ft. span, had trusses consisting simply of light rafters resting on circular ribs, each formed of three thicknesses of board. After doing duty there, these trusses were sold, and some of them were used in a public building at Notting Hill, where in all probability they may still be seen. Laminated bent ribs were in vogue some 40 years ago, and are extremely strong. To form them thin boards were bent to the desired curve upon a temporary centre or cradling. Other thin boards were then bent down on the backs of them, and fixed to them by screws and marine glue. More layers of board, sometimes to the number of 12 or 14, were successively affixed in the same way, and if the work was properly done the ribs so made had no tendency to "spring." The work, however, was troublesome and expensive, and this type of rib has gone out of fashion.

Turning now from carpenters' to joiners' work, we have more than ever to guard against the effects of shrinkage by drying, and expansion by the absorption of moisture. According to some experiments made by Professor de Volson Wood, and reported in the *Scientific American*, specimens of dry pine put into water and kept there for 37 days were found to expand nearly one-fortieth of their width and one-two-thousandth of their length. The latter quantity is negligible; but the former means an expansion of  $\frac{1}{4}$ in. in a 10in. board. In bad joinery, a degree of swelling comparable to this sometimes takes place when dry doors are put into a damp house. Then they have to be "eased," or there is no opening them, and subsequently, as the house dries and is inhabited,

they shrink again, and let in draughts. Sashes do the same, till they rattle in every wind; door-panels shrink, and show unpainted or unvarnished wood next the framing, even if they do not actually crack down the middle and let daylight through. The floor-boards part company, and after a year or two there is room enough to put the thick end of a drawing pencil between each pair. The ingenious joiner, foreseeing what is going to happen, sometimes tries to provide against the evil day by leaving the edges of his floor-boards rough. Then the dirt of the rooms hangs to them, and partly hides the cracks; but this way of getting over the difficulty is not cordially approved either by the doctor or the sanitarian. First of all, under the head of "Superintendence," it may be remarked that in actual execution the joiners' work in modern buildings is very seldom as good as the specification directs it to be. To remedy this evil, there is needed first of all a clear and distinct description, in the contract, of the kind of wood required, what port or ports it is to come from, and of what class it is to be. Mere vague statements that all materials are to be "the best of their respective kinds" are set aside in practice, for it is generally possible to dispute to an unlimited extent as to what the best is. But if "Archangel deals," or "Omega deals" are specified, it is a plain question of fact whether those which the contractor is using really come from Archangel or from Omega. The onus of proving this, and of showing that the particular description of Omega or Archangel deals is that which he agreed to supply, should rest on him, and a clause to make it rest there ought to form a regular part of every contract. An alternative plan is for the architect to keep in his office samples of each kind of wood required for different purposes, and to provide that no wood shall be inserted in the building which is not equal to the particular sample provided. In one or other of these ways, it will really be found practicable to obtain the sound and seasoned materials which are so constantly asked for and so seldom supplied. Then it only remains to use them wisely. Broadly speaking, this means using them in narrow widths and moderate thicknesses. It saves the joiner's time to do just the reverse. If he can put in a single 12in., or 14in., or 16in. board instead of making up his width out of several 4in. or 5in. sizes, he is spared the trouble of making and fitting together three or four grooved and tongued joints, and his work when he finishes it looks none the worse for the omission. A few years afterwards, however, his wide board shrinks and leaves a gap, perhaps, of  $\frac{1}{4}$ in. or more. But he is not there to see it, and so he goes on all his life, saving present trouble to himself by laying up future trouble for the people who employ him. It is its width as well as its softness that makes him so fond of yellow pine, and in the width of pitch-pine boards he finds some sort of compensation for their undoubted hardness. In Manchester, and perhaps in the South of England also, it was his favourite practice, some years ago, to work sham V-joints on his matched boarding. The drawings showed it, perhaps, in 4in. widths, and to all appearance it was so executed. But time, which detects so many frauds, detected this. The majority of the V-joints remained as close and true as it was possible to desire, yet one out of every three gaped so widely that the boards there almost fell apart. Then it became clear that the boarding, to save trouble, had been made in 12in. and not in 4in. widths, and that the apparent joints between were nothing but deceptive channels on the surface.

The carpenter and joiner have here been dealt with together. But in the erection of a building most trades overlap, and before the joiner can begin to fix the greater part of his productions the slater or the tiler must make the place weatherproof. Then a fresh kind of trouble often arises. When ordinary Welsh slates are used in a quite ordinary way, the work, perhaps, may go on smoothly. "Countesses" are the stock size which, apparently from the mere force of habit, a great many architects agree in asking for. Smaller sizes look better, and are often cheaper to use, but it is stated at the quarries that there is little demand for them. So the slaters are turned on to the building to do their business according to their regular routine. There may be a little question with them as to the amount of lap they are giving, and a more serious one as to the sort of nails they are using. A "copper nail," in the slater's vocabulary, means any nail

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which has a trace of copper in it, and if it is not absolutely white he does not see why the architect should object to its containing 80 or 90 per cent. of zinc. In short, he tries to substitute a "composition" nail, a variable object, always much cheaper than copper, and sometimes fairly good, though at others intolerably bad. When a superior sort of slating is wanted there is more risk of disputes. This is not so much the case about Westmorelands, which are generally excellent in quality, and which make an admirable roof when laid by slaters who are thoroughly accustomed to them. But it happens sometimes with cheap green slates, which are put on the market under fancy names, and about which there is no definite information to be obtained, except that they may be had from such-and-such a firm. The contractor supplies a sample of them, and the architect approves it. Before the slating has gone on far, he discovers perhaps that another quality of slate, soft and rotten, though nearly matching the approved one in colour, is being substituted. He interposes, and directs its removal. Then there arises a discussion between himself and the contractor, with the slate-merchant intervening. It goes through the regular phases which every professional man knows so well. First, there is a downright denial that the slates are not the same. This has to be disposed of by subjecting the two kinds to various tests, and proving that their properties are different. Then comes an assurance that they are both from the same quarry, and that it is impossible to obtain the one sort without the other. This, of course, is nothing to the purpose, for since the contractor supplied the sample, he must pick the slates over till they match it. His next argument is meant to be the final one. There are no more slates like the sample in this country; it will take weeks or months before they can be imported from some place vaguely described as "abroad," and in the meantime the building will be at a standstill. The answer to this is probably a direction to strip off the slating as far as it has been done, and to substitute something else as good as the sample, and of a colour approved by the architect. If this is firmly insisted on, the difficulties come to an end. The contractor unexpectedly finds—somewhere or other—a sufficient stock of the right quality, and completes the work as he undertook to do. It is not intended to suggest that contractors in general will act in this way. But such conduct is common enough to call for caution and forethought, and a chapter on superintendence must, from the nature of the case, be rather a warning against the wiles of the bad builder than an insistence, however deserved, on the merits of the good one. The lesson is, that the prudent architect will know where his slates come from before he begins to use them.

#### STABLE CONSTRUCTION AND SANITATION.—V.\*

##### OUTLET VENTILATORS.

**T**HE simplest and cheapest form of outlet ventilator for stables with an open roof consists of one or more openings arranged near

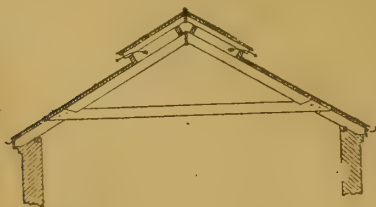


Fig. 25.

the ridge. Fig. 25 is a section through a ventilating ridge as sometimes adopted for stables of cheap construction. The warm vitiated air escapes through the open spaces between the small rafters; but such means are quite inadequate for thorough ventilation, whilst the rain and snow are also apt to be driven into the building through the unprotected openings.

Fig. 26 is an improvement upon the previous method, the height of the openings being increased and the space filled in with louvres. The illustration shows a section through an open queen-post roof with a continuous ridge louvred ventilator. Occasionally a portion of the roof is

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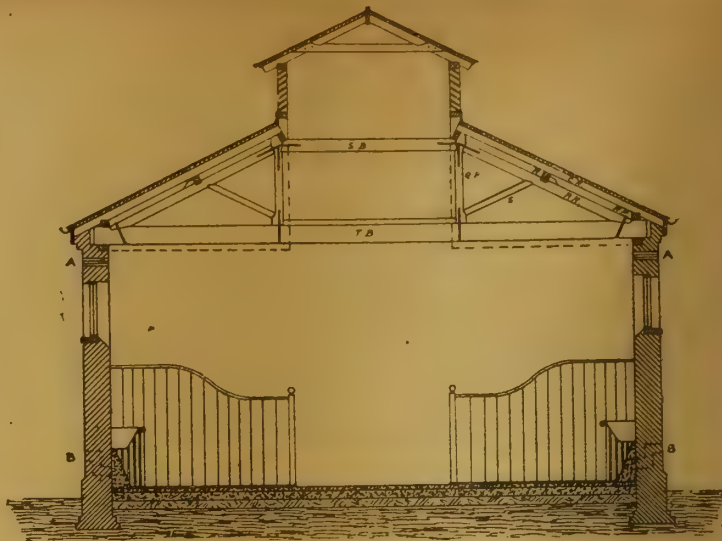


Fig. 26.

ceiled on the underside of the tie-beams and on the inner side of the queen-posts, as indicated by the dotted lines. Sometimes, instead of the roof ventilation being continuous, it is divided into a series of small ridge ventilators placed at intervals,

The principal objection to the ordinary methods of louvred ridge ventilation is due to the fact that there is a tendency to down-draught, whilst in very high winds the rain and snow is driven into the building; but if the louvres are arranged

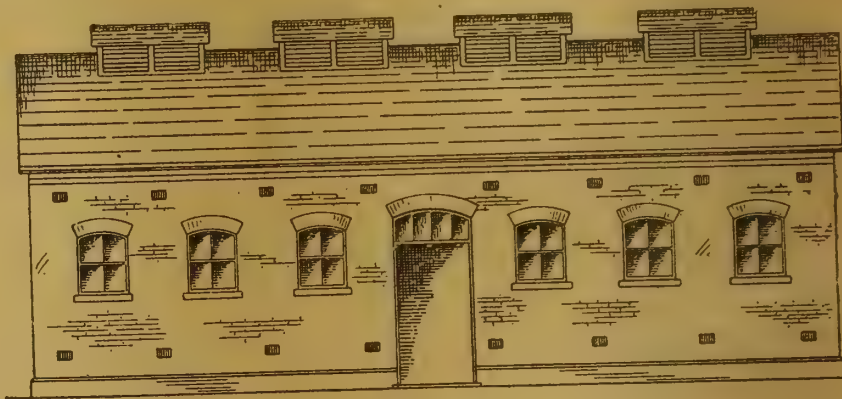


Fig. 27.

as in Fig. 27. In another arrangement, the louvred ventilators take the form of small dormers on each side of the ridge, as shown in Fig. 28. The louvres themselves may be fixed, or constructed to open and close. Where the latter

so that those on either side may be closed (according to the direction of the wind), and sufficient fresh-air inlet area provided, the deleterious effects of down-draught and driving rain may in a great measure be prevented.

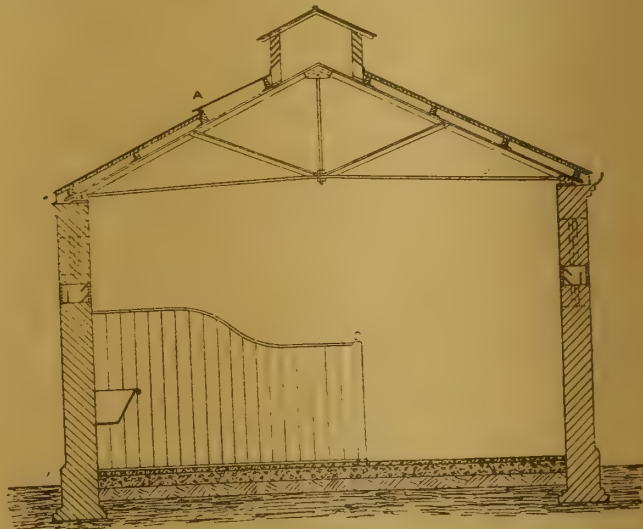


Fig. 29.

method is adopted they should be so designed that whilst either side may be opened or closed at will, yet under no circumstances should both sides be capable of being closed at the same time. Fig. 29 is a section through an iron roof having continuous ridge ventilation fitted with iron louvres.

Instead of adopting the common form of louvred ridge ventilator, a type of exhaust ventilator similar to that shown in Figs. 30 and 31 may be used with advantage, the efficiency of the ventilation being thereby increased.

Perhaps the most satisfactory form of outlet



ventilating appliance is a well-designed *turret* exhaust ventilator, so arranged as to be freely acted upon by the wind when blowing from any point of the compass. In this respect it will be seen that longitudinal ridge ventilators are inferior, inasmuch that the ends are usually closed, so that the direct action of the wind when



Fig. 28.

blowing from certain quarters is virtually lost. A good type of turret exhaust ventilator should be capable of producing a continuous up-draught in any wind, at the same time being perfectly weatherproof and impervious to driving rain or snow, and noiseless in action. In addition, the exhaust ventilator should be designed to provide, as far as possible, an unrestricted air-passage of large area, so that, independently of the wind, a free exit may be given to any current of air which may be created by an excess of temperature of the internal over the external air. Figs. 32 and 33 are sketches shewing exhaust ventilators of a simple and inexpensive form, fitted with

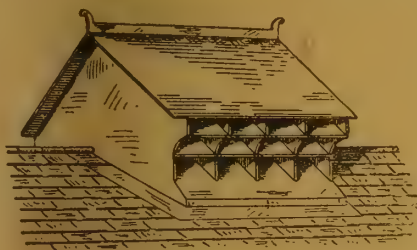


Fig. 30.

vertical and horizontal baffle plates respectively. Ventilators of this description may be made more or less ornamental in appearance by being inclosed within a specially designed turret or *flèche*, as indicated in Figs. 34 and 35.

In situations where a turret ventilator is undesirable on architectural or other grounds, sufficient outlet ventilation may be obtained by the use of what are known as *concealed* or *invisible* roof ventilators. Fig. 36 is a common form of so-called hidden ventilator. The wind, entering the ventilator on one side of the roof, passes over the opening A, and out on the other side, at the

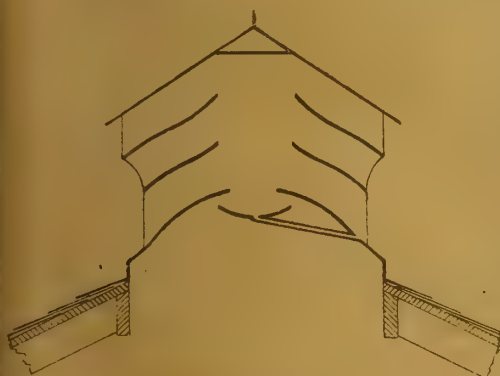


Fig. 31.

same time withdrawing a portion of the internal vitiated air with it. Any water driven into the ventilator is caught by the tray B, and discharged on to the roof by means of a small tube, C. Concealed ventilators are not so efficient as turret ventilators, as they are not so freely exposed to the action of winds, and for this reason the latter are to be preferred.

#### GENERAL SCHEME OF VENTILATION.

Having considered the essential principles which should govern the construction of any

system of natural ventilation, and also the various forms of ventilating appliances which have been found to give the best practical results, it becomes necessary to determine the most satisfactory disposition of the fresh-air inlets and foul-air outlets in relation to the building as a whole, and for the comfort of the animals confined therein.

Fig. 37 is the section of a stable in which the

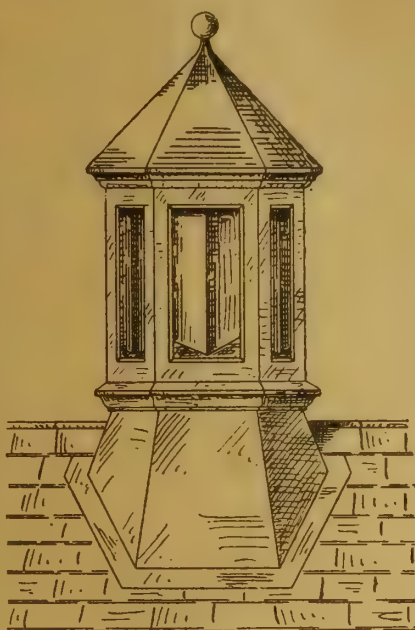


Fig. 32.

fresh air is admitted at the head of each stall by means of a ventilating stall partition, as already described and illustrated (see Figs. 22 and 23) in detail, together with a Tobin fresh-air inlet-tube (see Fig. 21) fixed in the front wall of the stable directly opposite each stall partition. The warm vitiated air is removed by means of one or more foul-air flues (according to size of the stable) passing vertically through the roof, and terminating in a suitable exhaust turret ventilator.

A modification of this arrangement is shown in Fig. 29, in which wall inlet ventilators are fixed

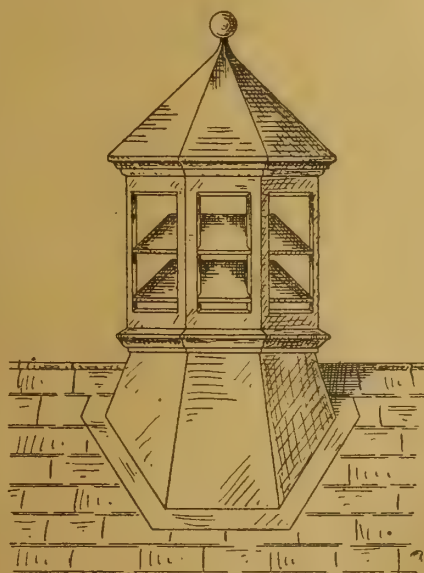


Fig. 33.

opposite each other in the front and back walls of the stable, near each stall partition.

In the ventilation of army stables, the building is usually provided with an open roof and continuous ridge ventilation for the exit of vitiated air. The ridge ventilators are in some instances arranged so as to allow of their being closed on either side, if necessary, but not on both sides at once. Fig. 38 is a section showing the method of ventilation adopted for a single row of stalls.

Fresh-air inlets are provided at the eaves level of the building in the form of a continuous course of ventilating bricks, 3in. deep, to both front and back wall, as shown at A A of sketch. In addition

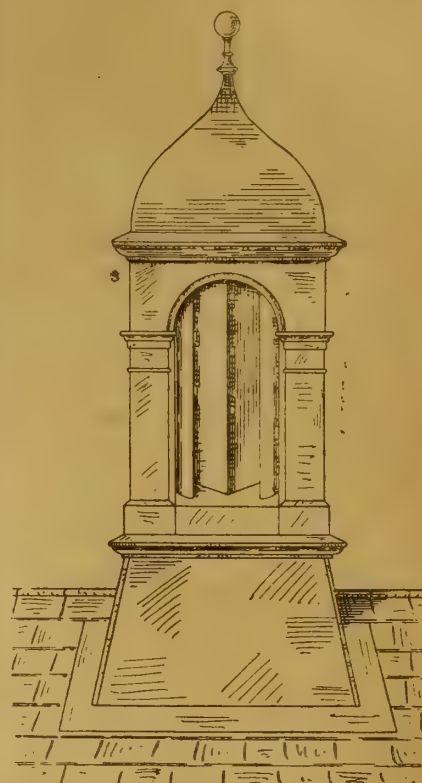


Fig. 34.

to the high-level fresh-air inlets mentioned, a 9in. by 6in. low-level fresh-air inlet, with traverse or drop opening, as indicated at B, is arranged at the head of each stall partition

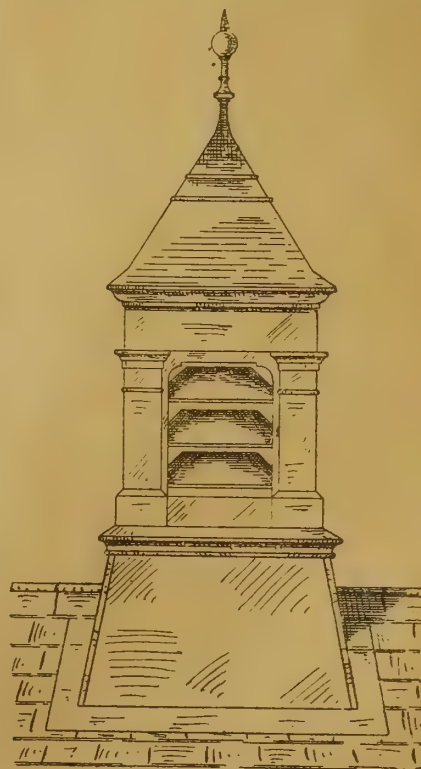


Fig. 35.

under the mangers, the air being allowed to circulate in the stalls through the gratings with which each stall division is furnished. A corresponding fresh-air inlet is fixed in the front wall at the rear of each stall, or else a continuous low-



level ventilating course is provided in the front wall, as indicated at C. The low-level fresh-air inlets at the head of the stall partitions under the mangers should be placed about 2ft. 6in. above the ground outside. They assist materially in supplying fresh air direct to

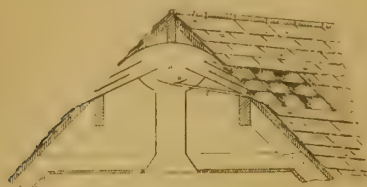


Fig. 36.

each horse, besides helping in the more thorough renewal of the internal air, whilst the velocity of the incoming air at the low level is so greatly reduced in passing the traverse that any serious risk of horses experiencing a hurtful draught from such inlets is avoided.

In the case of stables with a double row of stalls, a slight modification of the foregoing method of ventilation is adopted, as shown in Fig. 26. Provision is made for the removal of the foul air by means of continuous ridge ventilation. The fresh air is admitted through a ventilating eaves course, as already described,

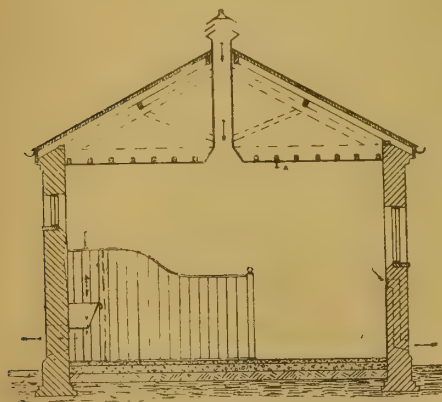


Fig. 37.

and a low-level fresh-air inlet with traverse is fixed at the head of each stall division. This provides a total effective fresh-air inlet area of about 130sq.in. per horse.

Such a form of ventilation is eminently suitable for large stables where horses of robust physique are housed, and where an entire absence

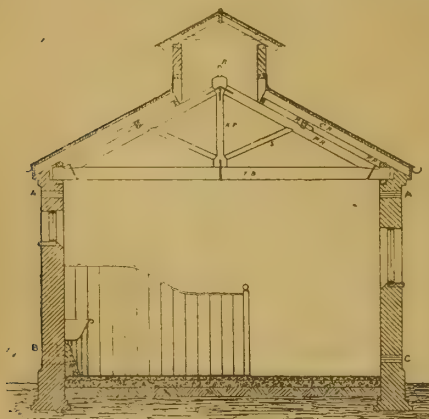


Fig. 38.

of complicated and expensive ventilating appliances is a necessity.

It must be remembered that, whilst providing ample ventilation by means of fresh-air inlets and foul-air outlets, all stable windows should be made to open, so that the whole building may be thoroughly flushed with large volumes of air when required.

## WATER-COLOUR DRAWINGS FROM ITALY, ARCHITECTURAL AND TOPOGRAPHICAL.

MR. A. WALLACE RIMINGTON'S beautiful sketches are to some degree familiar to our readers, seeing that from time to time we have reproduced some of his studies from Spain and Italy; but the absence of their brilliant and delightful colouring necessarily has been a want in our monochrome photo-prints. An opportunity, however, is at the present time afforded, to all who can visit the Fine Art Society's galleries in New Bond-street, for increasing an acquaintance with this painter's thoroughly artistic work. The opening during the past few days of an exhibition of about 140 water-colour drawings, illustrating three years' "Wanderings in Italy" by Mr. Wallace Rimington, is a circumstance well worthy of note in an architectural journal like the BUILDING NEWS, directing the attention of all lovers of pure water painting and historic architecture to this admirable collection of sketches, chiefly illustrating ancient buildings. Their author is not only an accomplished draughtsman, with a keen appreciation of his subject from an artist's point of view, but he brings to bear upon it a literary knowledge which considerably enhances the interest of all that he undertakes to represent. The complexity of some Italian subjects, where the painter would be true to the architecture and landscape, continually furnishes a problem of intrinsic interest, for, as Mr. Rimington rightly says, "interest of subject and artistic effect often lie widely apart." Yet he can hardly be an artist who invariably chooses the easier effect, and avoids the attempt to keep them united. It will be impossible to name more than a few examples from this exhibition, though an hour or two may well be spent in following the painter in his industrious and enthusiastic wanderings, wherein, from start to finish, his industry seems to have only been second to his enthusiasm, while both these well-sustained virtues nearly always in a marked degree have been governed by an artistic ability of no mean order. The Maugia Tower, Siena (No. 18),

In the mid city, where the strong  
Bells turn the sunset air to song,  
And the towers throng

furnishes a grand subject for a fine drawing, representing that noble campanile in pure sunlight, and the façade of the adjacent buildings in strong shadow. The famous Gothic pulpit in the interior of Siena Cathedral (16) is well shown; and one can but be struck by the skill of Mr. Rimington's broad, bold handling of the great intricate façade of the Duomo in all its pride of opalescent grandeur (No. 85), which he has so well indicated in his comparatively small exterior. Hanging next it is the delightful corner of a street from Viterbo, "the Nuremberg of Italy," with its balconies and jumble of archways (No. 83), recalling a much-prized drawing made years ago by Mr. A. H. Haig, the architectural artist. Mr. Rimington can be as delicate as he often is brilliant in his colourings. The truly lovely landscape inland from Naples (81) is an instance of this, with the tender softness of tone suggested by the distant Apennines distinguished in the haze by their summits still touched by snow. The great portal of Cremona Cathedral (87), or the clustered Byzantine cupolas of Sant'Antonia Padua (95), as seen from the cloisters, form subjects replete with architectural detail, and these only as instances to indicate how heartily the author of these drawings grasps an elaborate subject. This, too, is manifest in several other of his studies, as in the interior sketch of Milan Cathedral (112), which is, as Street says, "absolutely and without doubt one of the finest interiors in the world." The Tower of San Giovanni Batista, Genoa, the interesting old Romanesque church near the Doria Palace, groups charmingly in the street scene, No. 118, and another delightful like study is provided by No. 76. The Via Pellicciai, Verona, illustrated in the BUILDING NEWS, from last year's Royal Academy, for Jan. 1st, 1897. The grey tone on the apsidal façade of Modena Cathedral (71) sets off the brilliancy of the market scene, and the river view of "the Bridge," Mantua (38), is a successful study of much delicacy, showing the approach to Mantua by this long bridge over its reedy lagoons, the many-towered outline of the city rising almost in silhouette against the sky. The Lagoons near Torcello (14) we noted as a cold clear rendering of clouds and water, forming a welcome break

amidst the brilliant warmth of many a sunshine. The Courtyard of the Palazzo Bevilacqua, Bologna (No. 7) shows a fountain in dark grey against the mellow cream of the arcade of a delightful cortile most skilfully handled. These notes will suffice to indicate the thoroughness of Mr. Rimington's methods, and serve to suggest to those who have read them how entirely his exhibition merits an early visit.

## PROPOSED SCOTTISH BUILDING TRADES FEDERATION.

A MEETING was held in the Trades' Hall, Glasgow, on Saturday, to consider the question of a Scottish Building Trades Federation. There was an attendance of about forty delegates, and the chair was occupied by Mr. John Hardie, president of the Glasgow and Suburbs Building Trades. Mr. T. Anderson, secretary of the Glasgow Trades, explained the purpose of the meeting. The question of a Scottish Building Trades Federation had been under the consideration of the various trades, and one and all were agreed that such a Federation would be a benefit to the building trade of Scotland. The Glasgow and Suburbs Building Trades Federation, with the approval of the Aberdeen Building Trades Federation, the Associated Carpenters and Joiners, and other affiliated trades in the local federations, were of opinion that the time had now arrived when it was their duty to take the initiative in bringing about a closer bond between the workers in the building trade. No working member of the building industry could fail to have been impressed with the strides federation had made of late years among the employing class. Again and again efforts made by the workers for an improvement in their hours, wages, or conditions, had been met by "Free Labour" and similarly discreditable opponents, who were drafted from every part of the kingdom at the dictates of the employing interest. It could not be wise that the workers should "mark time" while their opponents advanced. The composition of the conference was as follows:—Painters, 7; slaters, 1; labourers, 2; masons, 2; sawmillers, 1; bricklayers, 4; glaziers, 2; tilers, 1; carpenters and joiners, 16; plumbers, 2;—total, 38. Mr. Munro, Amalgamated Joiners, Edinburgh, moved: "That we establish a Scottish Building Trades Federation for the purpose of forming a closer bond of union between the workers of the building trades." Mr. P. Keenan seconded. Mr. Steven moved, as an amendment, "That we approve of the principle of a national federation." After some discussion, Mr. Henderson moved: "That we approve of the establishment of a Scottish National Building Trades Federation," which was accepted by Mr. Steven. Mr. Riley, labourers, Glasgow, seconded the amendment. On a vote being taken, Mr. Henderson's amendment was adopted by 21 votes to 16. Mr. M'Lean, bricklayers, Glasgow, moved: "The object of this federation shall be to maintain the right of combination of labour by trade unionism, by mutually supporting any of the societies within the federation if individually attacked by employer or body of employers; to promote conciliation in trade disputes, and to advance and elevate the cause of labour generally." Mr. John Ure, tilemakers, seconded. Mr. Riley moved, in addition to the objects of the federation, the words "organise the workers in connection with the building trade." Mr. Ritchie, Dundee, seconded. Mr. M'Queen, plumbers, said the effect of the addition would be to make the federation dictators to the trades. By 26 votes to 13, Mr. Riley's addition was adopted. The meeting then discussed the constitution of the federation.

## WORKMEN'S DWELLINGS IN MANCHESTER.

THE sanitary committee of the Manchester Corporation have for some time past been considering proposals for utilising for the purpose of tenement dwellings and cottages for workmen a number of building sites now in possession of the Corporation. A scheme, based upon recommendations contained in a report of the city surveyor, was submitted to the city council for adoption at its meeting on Wednesday. The city surveyor says:—"The total number of persons to be housed is 2,584. The sites known as the Oldham-road area and Pollard-street area are to have buildings so constructed as to contain



in the aggregate not fewer than 2,034 persons. The Oldham-road area is divided into two building sites of nearly the same size. Tenement dwellings of five stories have been erected upon the east portion of the site between Spittal-street and Bengal-street. These dwellings contain 235 double rooms and 48 single rooms, and accommodate 848 persons. The remainder of the site between Spittal-street and Cornwall-street is available for the erection of additional buildings. The Pollard-street area is covered by tenement dwellings very similar to those that have been erected on the Oldham-road area. These dwellings consist of 130 double rooms and five single rooms, and accommodate 448 persons; this leaves a balance of 738 persons still to be provided for on the Oldham-road area. Three hundred persons are to be housed on the Chester-street area, and 250 persons on the Pott-street area, making a total of 1,288 persons still to be housed." In order to obtain accommodation for this number of persons without having recourse to high buildings similar to those already erected, the city surveyor has examined the other sites belonging to the committee which may be utilised for the erection of labourers' dwellings. A plan is given which shows the position of five building sites, situated in Oldham-road, Chester-street, Pott-street, Harrison-street, and Pryme-street. With regard to the Oldham-road area, the plan adopted provides for buildings to front Oldham-road, four storeys in height, and to consist of 13 shops and dwelling-houses, with frontages varying from 19ft. 3in. to 29ft. 6in. The first, second, and third stories would consist of five-roomed dwellings connected with the shops. The buildings on the remaining portion of the site would consist of two rows of two-story tenement buildings, fronting to a new 12 yards street, and one row of five-roomed cottage dwellings, fronting to George Leigh-street, which is 18 yards wide. The clear space between the buildings at the rear would vary from 58ft. to 55ft. in width. The four rows of buildings would afford accommodation for 377 persons. The estimated cost of erecting these buildings is £17,901, equal to £36 15s. 3d. per person. The estimated cost of sewerage and paving the new streets, exclusive of the cost of widening the existing streets, is £900, to which must be added the estimated value of the site—viz., £7,981, or a total of £26,782. On the Chester-street area it is proposed to erect four blocks of buildings, with frontages to Chester-street, Marsland-street, and Hulme-street. The buildings would be two stories in height, and each dwelling would consist of two two-roomed and two three-roomed tenements. These buildings would afford accommodation for 306 persons: The estimated cost of these four blocks is £11,873, equal to £38 16s. per person, and the estimated cost of new streets, exclusive of street improvements, is £350. The estimated value of the site, which has an area of 4,554 yards, is £2,277, or a total of £14,500. An alternative scheme is submitted. On the Pott-street area it is proposed to erect two blocks of four-story tenement dwellings, of a similar character to those already described for the Chester-street area. The buildings would accommodate a total of 400 persons. It is proposed to widen Pott-street, Sandford-street, Caroline-street, and Wharf-street, making the width of these streets in each case 14 yards. The estimated cost of the buildings is £15,357, equal to £38 7s. 10d. per person, and the estimated cost of new streets, exclusive of street improvements, is £164. The estimated value of the site, which has an area of 3,914 yards, is £1,957, or a total of £17,478. The committee recommended the council to approve of and authorise the erection of a model lodging-house in Harrison-street, in general accordance with the sketch plans prepared by the city surveyor. The proposals contained in the report of the city surveyor with respect to Pryme-street were withdrawn. The number of persons to be accommodated by the schemes recommended for adoption is 1,346.

#### THE GARDEN IN RELATION TO THE HOUSE.

At the fortnightly meeting of the Royal Institute of British Architects, held on Monday evening, the President, Professor Geo. Aitchison, A.R.A., in the chair, a lecture on "The Garden in Relation to the House" was read by Mr. H. E. Milner, F.C.S., Assoc. M.Inst.C.E., Hon. Associate. During the preliminary business of the meeting, the death was announced from the

chair of Mr. William Tipping, F.S.A., of Brasted, Sevenoaks, who had been an Hon. Associate since 1878. Mr. Milner devoted the greater portion of his address to the treatment he recommended to be adopted in laying out grounds, particularly in their more immediate relation to the house, and indicated generally a practical application of the theories advanced. The formal treatment of gardens reached, he showed, a high state of perfection under Elizabeth, when the architect who designed the house also laid out the garden, with its forecourt and broad terrace, its straight walks leading from it encompassing the flower-beds, and all harmonising with the building. Little thought, however, was devoted to the treatment of the country outside beyond the planting of avenues. Towards the end of the 18th century fashion ruled the destruction of most of the old formal gardens, to be replaced in very many instances by a no less artificial and formal imitation of nature. The designers were not content with amalgamating with whatever was good of the old work a natural treatment of the outlying ground, or of giving greater breadth to the existing formal work, but swept away all this, and replaced it by meaningless walks, by clumps of trees and shrubs dotted irregularly on the lawn and park, by a boundary of planting, by imitation of bits of natural scenery, by the introduction of artificial ruins and such-like objects, with the desire of making a picturesque landscape. The lecturer then went on to speak of the happy mean between the formal and the picturesque treatment, differentiating between the treatment of terraces, walls, steps, and balustrades in stone and verdure. Architects should extend their work in the garden in connection with the building; but this work should go hand-in-hand with the composition of the greater picture, which the art of landscape gardening should produce. The increased resources of modern horticulture should be taken into account; not merely the eye, but the mind, should be appealed to by the beauty of composition of line, colour, perspective, and grandeur; a liberal art should not degenerate into a mechanical one. Places differed in the conformation of the ground, in climate, in soil, in the requirements of the owner, in the amount to be expended, and in the possibility of an extension beyond the immediate precincts. It was therefore futile to lay down any hard-and-fast rule for design. The approach to a house should always appear to be direct, and any deviation from such directness should not only arise from, but should also be made to arise from, some decided obstacle. By direct was not meant straight. A straight approach required careful treatment. It was artificial in character, it could appropriately be used when an imposing or somewhat pretentious building was at the end of it, or when the distance was short, and when the country was flat. In sloping ground, it should, if possible, be made against the slope of a hill. The gradient should be even and flat, or very slightly and continuously curved; otherwise it would appear not straight. If the ground were very undulating, a straight road was out of character with its surroundings. A curved line of road was generally to be preferred, as, being more easy of construction, more varied views could be obtained, its gradient could be varied, following within limitations the natural undulation of the ground, and the side slopes could be more easily and freely dealt with than the sides of a straight drive. The lodge and entrance-gates belonged to the drive, and should be parallel with, and at right angles to it, as distinguished from the highway. The face line of lodge should be at least 10ft. from the edge of the drive, and its windows should be able to command the entrance and a certain length of drive. It was advisable to mark distinctly the difference between the dusty highway and the shaded, well-trimmed drive within the gates. Planting might be introduced on either side of the entrance, but once well inside a view should be given of the outlying grounds, or stretch of park, or distant wood. A curved drive should not be planted continuously, but broad masses of planting introduced, at first to shut off the highway, at turns in the drive, and on the top or slopes of knolls round which the drive may wind. The direction and level of the approach, and the character of the architectural features, ruled greatly the plan to be adopted for the treatment next the house. The treatment of the terrace also depended very much on the architectural character of the building. By "terrace" he meant not only the narrow strip of level ground placed parallel with

the house, or the more stately portion—often with architectural adornments—laid out along the face of the structure, but the whole of the ground that formed the base or setting of the building. The author then proceeded to consider the treatment of the garden proper, quoting partly from his book on the subject, which defined the system he advocated. So many considerations press in to vary design in the general plan of a garden, that arbitrary dealing by imposition of what might be termed paper designs, however ingenious, was ill-advised. The detailed plan should spring from the site as an adaptation of its natural, or created natural, features, and should not be forced upon the position, crushing it to an artificial scheme. To copy simply the design of another place was inadmissible. Considerations that ruled in this connection were almost infinite—extent, geological formation, soil, existing natural formation or features, climate and aspect, the display of distant beauty, conformity to outside influences, particularly to the requirements of the possessor, and the expenditure of money that would be made. There were points of similitude between the painter's art and landscape-gardening; but the landscape-gardener must consider that his colours change and grow; he must realise as he creates his picture that in a few years what now seems like a light green stroke of pigment to the painter may have become a tall tree, beautiful in itself, but of altered beauty, either helping or marring the landscape. He must follow Nature by adapting or garnering her beauties, and tutoring her to a display of them. But by following Nature was not meant a slavish imitation or reproduction of any of her particular scenes. Some were unattractive, some very inappropriate—all were subject to dissimilar conditions, and imitation in nature as well as in art produced pettiness. But the spirit of the beauty of Nature, embodied as it were in those of her works or features that express her majesty, simplicity, peacefulness, sweetness, repose, refinement, strength, and variety in form, colour, abundance, or any of her modifications as parts of loveliness, should be included and brought into juxtaposition in an ideal scene so far as it was possible to promote its natural development. The terrace, the region immediately next the house, and the general arrangement of the walks and gardens having been discussed, the author next dealt with the most suitable positions for planting trees and shrubs, principles of grouping, the effect of colour on distance, character of foliage, &c. He maintained that they should carry out in the parts surrounding the house the architectural feeling of the design in terraces, walls, steps, basins, beds, and so form a base; that they could still have the dignified and quiet delight of formal work—not a narrow curtailment of the whole design. But there was in addition a broader treatment beyond—a work difficult to proportion in relation to foreground, to broad lawn-spaces, to grouping, and choosing trees and shrubs for effect in size and colour, to directing the eye to desired points, to taking advantage of climate and character of the place either natural or acquired, to provision of light and shade in the undulation of the ground, and to a knowledge of horticulture. This art-gardening was far beyond the limitations of formal work only, for it could apply the balance and proportion of the latter, and, in addition, present a noble conception of art-work, in its execution of outline, surface-formation, and grouping, and draw into the picture the greater, broader, varied landscape.

A short discussion followed, and a hearty vote of thanks was passed to the lecturer.

#### PRESSURE IN PIERS ON FOUNDATIONS.

It is generally thought that the pressure of a pier upon its foundation is uniform, or distributed over the entire area. This belief is now considered open to question. According to the *Engineering Magazine*, Herr Rudolf Mayer, of Vienna, in an article discusses the question. He imagines the foundation of a pier composed of an elastic yielding material in layers or courses of constantly increasing area, and upon this assumption considers the sole of the foundation to bend down in a convex shape, the pressure being greatest directly beneath the axis of the pier, and diminishing outwards all round. When the foundation is composed of a rigid material, this diminishing distribution of pressure still exists, and the author



shows by diagram the weight at which the pressure diminishes with each course of the foundation masonry. "Thus, for a foundation of ten courses of stone stepping out uniformly from the base downwards, it is shown that 75·4 per cent. of the load is borne by that portion of the foundation directly beneath the projection of the base of the pier, while 12·3 per cent. is carried by the outer portion." No matter how deep the foundation, "the minimum pressure carried by the lowest course directly under the axis of the pier is 50 per cent. of the pressure at the top of the foundation." Herr Mayer deduces the law that "for tall piers the point at which the relative load upon that portion of the foundation which lies directly under the vertical projection of the pier reaches the minimum of 50 per cent. is found at a depth of foundation equal to one half the height of pier." According to this law of distribution of pressure on foundations, piers carrying considerable weight ought to be of a size or area in plan that will distribute the load safely, and several courses of footings are necessary to sustain a fair proportion of the load. The conclusion to be drawn from the theory is that, if the outer portions of a ten-course foundation carry only 12·3 per cent. of the load, a less number of courses would be of little value—an argument for deeper and more solid foundations of masonry than we are accustomed to use.

#### CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THE twenty-fifth annual general meeting of this association was held at the offices, 31 and 32, Bedford-street, Strand, London, W.C., on Wednesday, the 10th inst., the president, Mr. Henry Holloway, being in the chair. The notice convening the meeting, and the following annual report were taken as read, the report being unanimously received and adopted:—

1. In presenting their twenty-fifth annual report the council are pleased to be able to state that trade continues to be in a satisfactory condition, and but for the unceasing friction with the workmen, there is every indication of a period of prosperity.

2. The past year has been a time of exceptional disturbance with the workmen. Early in the year notices were received from the various trades demanding an increase in the rates of wages and a code of working rules. A special meeting of the members of the association, together with other builders, was called to consider these demands, and it was agreed to concede the advance in wages to the principal trades, provided they assented to a satisfactory code of rules. In pursuance of this decision arrangements were made for meeting each trade separately in conference. The main variations to the 1892 rules insisted upon by the council were the following:—(a) The working hours in winter to be altered—the breakfast time being abolished, the hour for commencing work being 8 a.m.; (b) a rule to put an end to the practice of the trade unions striking against non-union workmen; (c) the omission of the date (May 1st) for the termination of rules.

3. All the trades have practically accepted the foregoing. In dealing with the second item the council were successful in establishing the principle of a conciliation board, consisting of an equal number of employers and workmen, with power to call in an umpire, for settling disputes arising out of the rules. All the trades have agreed to this with the exception of the painters and labourers. The Plasterers' Association, after being on strike for over two months, agreed to a modified form of the rule which, however, has proved to be unsatisfactory.

4. The dispute with the bricklayers on Messrs. J. Mowlem and Co.'s works at the beginning of last year terminated at the end of February. The offer of arbitration made by the council was declined by the Operative Bricklayers' Society, but the strike was afterwards formally withdrawn.

5. The scarcity of skilled workmen throughout the country is a serious difficulty, and largely accounts for the independent and aggressive attitude of the trade unions towards employers. The council strongly urge special attention to this matter, and hope that every employer will take immediate action to deal with the difficulty by increasing the number of apprentices and improvers in all trades, but especially those of plasterers and bricklayers.

6. The case of "Trollope v. the London Building Trades' Federation" has, the council

are pleased to record, been carried to a successful issue, the plaintiffs succeeding in getting the injunction obtained last year made perpetual.

7. The council have under consideration a proposal for putting the association in a more satisfactory position financially by creating a reserve or contingency fund. The numerous disputes and litigation with the trade unions have caused a considerable increase in the expenditure during the past year, which the council hope will be readily met by the members of the association, especially as the council consider that the result of the proceedings in the case of Trollope's Black List, before referred to, will be beneficial and of vast importance to the trade.

8. The council take this opportunity of expressing their obligations to the members of the various committees.

9. The council would again urge upon the members the importance of impressing on those employers who are not at present members the desirability of joining this Association.

10. In accordance with the rules, the audited accounts will be presented to the meeting, and it will be necessary to elect two auditors and three members of the council. The elected members of the council who retire are Messrs. Joseph Hill, William F. King, and G. J. Lyall, all of whom are eligible for re-election.

The secretary, Mr. R. S. Henshaw, having read the accounts for the year 1896, they were adopted.

Mr. Geo. Williams and Mr. Horace S. Foster were reappointed auditors, a cordial vote of thanks being accorded to them.

Mr. William F. King was re-elected, and Mr. W. J. Adamson and Mr. Howell J. Williams were elected members of the council. A vote of thanks to the chairman for presiding terminated the proceedings.

#### ST. SAVIOUR'S CATHEDRAL CHURCH, SOUTHWARK.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THIS grand church, the finest Mediæval building in London, after Westminster Abbey, has a record of more than a thousand years, but possibly the earliest reliable account of St. Mary Overie is dated in the year 1106, in the reign of Henry the First, when two Norman knights, William Pont de l'Arche and William Dauncey, aided by Bishop Giffard of Winchester, built the original Norman nave. This week the new nave designed by Sir Arthur Blomfield, A.R.A., has been opened by the Archbishop of Canterbury. No attempt has been made to reproduce the old church as it existed up till 1831, with the history of its successive changes marked by the various styles it exhibited, but something adhering to the more ancient lines, and thoroughly in harmony with the beautiful work of the choir, has not only been aimed at but realised. Messrs. T. Rider and Sons have been the builders, and Mr. Thomas Simpson has acted as clerk of the works. We are enabled to give to-day a general perspective view by Sir Arthur Blomfield, showing the new building as carried out, and we reproduce the plan, as completed, together with the elevations and longitudinal and cross sections from the contract plans. Other drawings, kindly lent us by the architect, will follow in illustration of this memorable work. Turning again briefly to the history of the church, we note that, although some few fragments of the old Norman Priory nave could be traced and preserved, the church and a great part of Southwark were burned in 1207, and it was probably soon after this that the reconstruction of the church was begun by Peter de Rupibus, Bishop of Winchester, who also founded the chapel of St. Mary Magdalene on the south side of the choir, afterwards, and until the Dissolution, used as a parish church. This chapel was destroyed during the early years of the present century. The nave of the great church was the part first undertaken after the fire; the choir, choir-aisles, and lady chapel are somewhat later in date, and are more refined in detail than the nave was. The transepts were undertaken at a much later period and remained long unfinished, while the central tower over the crossing was only carried just above the roof, and so remained for several generations.

During the reign of Richard the Second much damage was done to the church, principally in the nave, the repairs thus necessitated being carried out at that time in what we call the Early Perpendicular

style. The Early English stone-groined roof of the nave fell in in 1469, and was shortly afterwards replaced by a groined ceiling of wood of entirely different design, though good of its kind. The old roof of the north transept (removed about 1830) was similar, and very likely that of the south transept also, but of this there was no record. No further work of importance seems to have been done till 1520-28, when the tower was completed. Considerable alterations were carried out at the west end of the nave, and, finally, the reredos was erected at the east end of the choir. With this the Mediæval history of St. Mary Overie comes to an end. In 1540 the Prior Bartholomew Linstede retired, and surrendered the priory church to the King in exchange for £100 a year and a house rent free. The church now, doubtless, would soon have disappeared had not the parishioners of the united parishes of St. Margaret and St. Mary Magdalene, Southwark, purchased it from the Monarch, and thenceforth it became the parish church, under the new title of St. Saviour's, Southwark. Indignities of many kinds from this date onwards were committed in and on the fabric, which underwent numerous disfigurements, although considerable sums of money were no doubt expended from time to time on repairs and so-called improvements. Early in the present century the church became dangerous, and in 1818 the tower, then the source of danger, was repaired by Mr. George Gwilt, who restored the lady chapel a few years later. In 1830 the transepts were restored in a less satisfactory way by Mr. Robert Wallace, who carried out the groined ceiling in lath and plaster, and cast-iron pipes were used for wall-shafts, two of them being utilised as stove pipes.

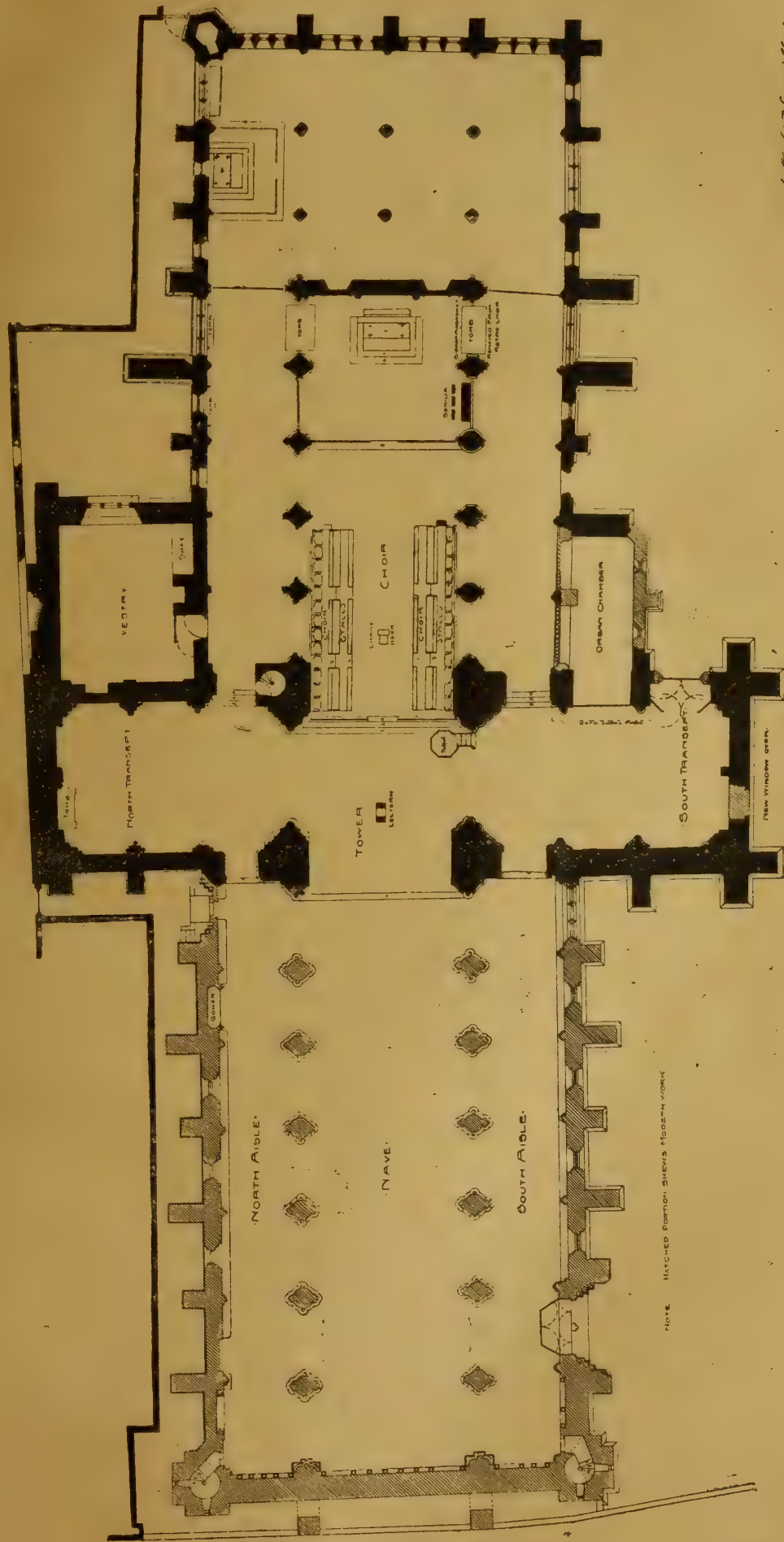
The nave had become in a bad state of dilapidation and decay, the roof being actually dangerous. Judicious repairs at that time would no doubt have saved it, but the parochial authorities removed the roof altogether, and left the building exposed to wind and weather for seven years, when it was taken down, and the nave which Sir Arthur Blomfield has replaced was erected. The first stone of that building was laid on July 26, 1839. The floor of the nave was raised 7ft. 6in. above that of the choir, and so, had the new work thus done been never so good, it would have been impossible to utilise it in connection with the transepts and choir. Its destruction, therefore, was a foregone conclusion if the church was ever to be re-used as a whole. The original foundations of the nave and aisles and certain portions of the old walls still could be found under the modern fabric, and thus Sir Arthur Blomfield's work (on plan) was, to some considerable extent, definitely settled.

The very large west window of Holy Trinity Church, Sydenham, has recently been filled with painted glass at a cost of nearly £1,000. It commemorates a deceased parishioner. In the six long lights are two rows of pictures which illustrate, each in two panels in the upper tier, three incidents in the life of Job, and in the lower tier Noah's Sacrifice, the Sacrifice of Isaac, and Jacob's Dream. In the tracery openings at the apex is the Holy Lamb, in the other pieces figures of Saints Michael and Gabriel, and of the four Evangelists. The surroundings are of canopy work in the Decorated style, in which style the church was built some years ago. The work is by Messrs. Lavers and Westlake, of Endell-street, and was designed by Mr. M. H. J. Westlake, F.S.A.

Mr. Denton Houghton, who was well known in the public life of the city, died at his residence, De Grey-terrace, Woodhouse-lane, Leeds, yesterday morning, after a fortnight's illness from acute pneumonia. Mr. Houghton, after serving his time to cabinet-making and upholstery, commenced business on his own account, gradually developing the concern by his energy and ability. He became a member of the city council for the first time in 1875, when he was returned as a Liberal for the west ward, which he represented for four years. His second entry to the council was as a Conservative representative of the north-west ward for which he sat from 1892 to 1895, when he was defeated by Mr. Peter Laycock. From 1891 to 1894 he was a member of the Leeds Board of Guardians for the north-west ward. He was vice-president of the Leeds and Holbeck Building Society, and was a leading member of the Leeds Property Owners' Association, appearing as the official representative of that body at the Local Government Board inquiry which was held a few months ago in Leeds in reference to the insanitary area. On that occasion he displayed considerable ability as a public speaker, and in the debates in the city council he was a frequent participant.



- ST SAVIOUR'S SOUTHWARK -





## THE CHURCH BELLS OF KINCARDINE-SHIRE.\*

ON one branch of ecclesiology, that relating to bells, there have been very few works of any architectural importance. Mr. Eeles' volume is an attempt to describe all the bells in the county of Kincardineshire, their history, uses, and ornaments, and some notice of the more interesting belfries. Little is known about Scotch bells, and Mr. Eeles' book will be welcomed by all interested in this subject. All the information that can be got has been brought together. The author is a student of bells, and his remarks will be of some value to those who are interested in a somewhat obscure subject. The methods of ringing are of importance in determining the kind of bells found. It is of interest to be reminded of the fact that throughout England and Scotland the richer churches have "several bells, obtained at various times, and without regard to their respective sizes or to the relation between their notes. The great bell was often dedicated to the patron saint of the church, and the smaller bells to the other saints who were commemorated in the church below; each was used separately for the services at the corresponding altar, while all were used for High Mass and on great occasions." Musical ringing was early adopted. In England this was done by making the heavy bells form part of the diatonic scale, and suitable for ringing in succession; abroad a carillon was added. In this country each bell was rung by a rope attached to a lever or to a half-wheel, therefore the bells were not "rung," but chimed. In the 17th century "change-ringing" came into use, and after the Restoration it became a popular amusement; bells were increased in size and weight, and five or six were common. Scotland chiefly followed the Continental usage: hence carillons are found at Perth. Many interesting facts are given by Mr. Eeles. He speaks of the practice of ringing bells at 8 a.m., and again at 10, the first being the Mediaeval Matins bell, the second the Mass bell, the High Mass being later; and the practice still continues, though the times of the present services are altered. Other old customs are mentioned. The author records 75 ancient bells in Kincardineshire, and these are in the hands of the Established Church, the Episcopal having only 12 out of that number. These are chiefly Scotch of modern date, or modern English. The illustrations show interesting belfries at Nigg, Kinneff, Fetteresso, Inverbervie, Garvoc, &c., towers being the exception during the Middle Ages; but an elaborate type of belfry, peculiar to Scotland, is to be seen. Those given are very interesting samples; that of Garvoc is of particular charm. We have no space to enter into the descriptive account given of the various bells. The ornamentation and lettering of those at Nigg and Skene (Aberdeenshire), Banchory, Kinneff are worth notice; but the work will be welcome to many an ecclesiologist who has been collecting information on this subject. The types of belfries and turrets given, such as those of Garvoc, Kinneff, and Nigg, are essentially Classical or Renaissance in character, and Aberdeenshire is rich in them. Low Country influence and detail are seen in the design. These are mainly of massive stone character, open on two or four sides; the angle pillars in some cases being baluster shaped, and the cornice crowned by a moulded stone roof, with finial or ball.

The Ipswich Corporation have adopted revised plans prepared by their borough surveyor, Mr. E. Buckham, for the sewerage of the California and Rose Hill districts, at an estimated cost of £7,000, and have applied to the Local Government Board for sanction to borrow the sum required.

The Heywood Town Council discussed, on Thursday last week, their future relations with Mr. James Diggle, who has hitherto been the borough surveyor and waterworks engineer and manager, and has also been allowed to carry on a private practice. After a long discussion it was agreed by 18 votes to 5 to adopt a recommendation from the General Purposes Committee to the effect that Mr. Diggle should be relieved of the duties of borough surveyor, but retain the position of water manager at his present salary of £300 per annum, in addition to which he is to be allowed to continue private practice, and is to receive a commission of six per cent. on all new engineering work which he carries out for the corporation.

\* By F. C. EELES. With Illustrations. London: Elliot Stock, Paternoster-row.

## OBITUARY.

MR. PAUL SCHULZE, one of the most distinguished American architects of the older generation, died last week in Oakland, California, at the age of 70. As a member of the firm of Cluss and Schulze, of Washington, D.C., the deceased was connected with many important works, such as the National Museum, the United States Medical Museum, the Public Market, and the remodelling of the Patent Office, besides designing and executing the Mexican National Monument in the city of Mexico. He had, however, before moving to Washington, distinguished himself in professional work in New York and Boston. It was in the latter city that his professional career in the United States began, and he is said to have been the architect of the chapel of Harvard College; but he went to New York in 1857, and was very successful there, designing, among other important buildings, the old Crystal Palace on Forty-second Street.

## CHIPS.

In their annual report, the directors of the General Hydraulic Power Company announce that they have entered into an agreement to purchase the Tower Subway to connect the existing mains on the north and south sides of the Thames.

During the past few days the face of the cliffs at Folkestone has suffered considerably by falls. Between the Leas lift and the shelter there has been an enormous fall, so that the asphalt path is encroached upon, and just to the eastward of the long flight of steps beyond the shelter many tons of earth have fallen, carrying with it fir-trees of considerable size. The earth blocked the pathways below, and gangs of men are employed repairing the damage.

The annual dinner of the Bath Master Builders' Association was held, under the chairmanship of the president, Mr. E. W. Wooster, on Friday. Among the company were the following members of the Bristol Association:—Messrs. A. Krauss (president), G. Wilkins (ex-president), G. Humphreys (treasurer), F. N. Cowlin, and Henry J. Spear (secretary). Mr. Krauss responded to the toast of the "National Association," and Mr. Spear, in speaking for "Kindred Associations," advised master builders to watch closely the Employers' Liability and Registration of Plumbers Bills when before Parliament. The toast of the "Architects and Surveyors" was acknowledged by Messrs. T. B. Silcock, F. W. Gardiner, and W. E. Underwood, all of Bath. The "Bath Master Builders' Association" was proposed by Mr. W. H. Jelley, and responded to by the president.

The business at the Auction Mart, Tokenhouse-yard, last week was of a very satisfactory character, although the largest property submitted was withdrawn. For general investments, competition was remarkably keen, and the aggregate realisation, £70,770, testifies to the unabated demand for income-producing properties of a moderate class, of which, with the exception of one sale of gas stock, the transactions entirely consisted. Last year the amount registered for the week was only £17,910, so that this year shows a considerable sum to the good. There has also been a decided improvement in the property market in Liverpool and district during the past week, several valuable lots having changed hands as the result of private treaty, in addition to the sales effected at public auction.

The city council of Coventry adopted on Tuesday the recommendation of the waterworks committee that Mr. E. J. Purnell be appointed waterworks engineer, with entire charge of the waterworks, at the salary of £200 a year, the appointment to take effect on his resignation of the office of city surveyor.

The urban district council of Ilford have adopted plans by Mr. Cropper for an infectious diseases hospital.

At the last sitting of Glasgow Dean of Guild Court, authority was granted for the erection of a large number of new buildings within the city. Chief interest centred in the application of the General Life Assurance Company, London, who received the necessary permission to erect a five-story building for offices on ground at 141, West George-street.

A meeting of the Association of Parochial Engineers was held at the St. Bride's Institute last week, Mr. A. Saxon Snell, F.R.I.B.A., occupying the chair. Mr. T. W. Smith read a paper on "The Disposal of Town Refuse," giving an account of the old system for the disposal of refuse, and pointing out the dangers which the public health encountered. He dealt with the merits and demerits of the refuse destructors of modern days, and described the method of working the destructors, pointing out that a good revenue was to be obtained from the sale of the "clinkers."

## COMPETITIONS.

BUILDING TRADES' EXHIBITION.—RESULT OF THE POSTER COMPETITION.—The premium of £10 offered for the best design for a poster to advertise the Building Trades' Exhibition in March next, brought forth some 30 competitors, the winner being "Simoun," J. Houry, 9, Atherley-road, Bristol. The following competitors were highly commended:—"The Master Builder," Muirhead Bone, 7, Jane-street, Blythswood-square, Glasgow; "Sphinx," Alfred Morgan, 89, Albert-road, Battersea Park, S.W.; "Bis," Robert F. Sherar, 13, Maxwell-street, Edinburgh; "L'Elephant Blanc," David Peare, 167, St. Vincent-street, Glasgow.

NORTH BRIDGE BUILDINGS, EDINBURGH.—The Edinburgh Town Council Committee on the North Bridge Buildings competition went over the first premiated plans of the proposed new premises, submitted by Messrs. J. N. Scott and J. A. Williamson (and illustrated in our issue of Oct. 16, 1896), and recommended them to the Lord Provost's committee for adoption, with some minor alterations.

SHEFFIELD.—A competition restricted to architects practising in Sheffield who are members of the Sheffield Society of Architects and Surveyors has been announced by the corporation of that city for designs for a new fire and police station at the junction of Westbar and Westbar Green, and the conditions appear to have been drawn up with unusual clearness and a desire to secure fair play. The design for execution, and three other designs, to each of which four designs a premium of £15 will be awarded, will be selected by three assessors, or a majority of them—viz., Mr. C. Hadfield, F.R.I.B.A., president; Mr. E. M. Gibbs, F.R.I.B.A., ex-president; and Mr. C. J. Innocent, F.R.I.B.A., F.S.I., honorary secretary and past-president of the Sheffield Society of Architects and Surveyors. The total cost of the buildings must not exceed £7,000, inclusive of warming, ventilation, drainage, and ordinary fixtures; but exclusive of furniture and special fittings. It is announced that "the assessors will not compete or carry out the work under any circumstances, either directly or indirectly, by any partner, assistant, relative, or in any other way." The author of the selected design will be employed as architect to carry out the work at the usual commission of 5 per cent. upon the outlay, in addition to the premium awarded, exclusive of bills of quantities and clerk of works, unless it be found that the design cannot be carried out for the amount stated. In the event of the non-employment of the author of the first design, the author of the one which stands second in the judgment of the assessors will be substituted, and so on. Designs are to be sent in by March 31st.

WELLINGTON, SALOP.—The results of the competition for the laying out of Lord Forester's building estate at Wellington, Salop, have been made known. Premiums were offered for the best designs, and the assessor, Mr. Wright, of Wollaton, Notts, has awarded the first to Messrs. Mawson and Gibson, Windermere, Mr. J. Holland, of Sheffield, taking the fourth. The estate is two miles in length, and it is to be laid out to accommodate all classes of residents, the designs showing mansions with several acres of grounds, detached and semi-detached villas, with ample grounds in each case, and model villages, each class of property being grouped in separate neighbourhoods.

A meeting of St. Paul's Ecclesiological Society was held at the Chapter-house, St. Paul's on Wednesday evening, when a paper was read by Mr. W. H. St. John Hope, M.A., on "The Plan and Arrangement of a Cistercian Abbey."

The well-known Belgian landscape painter Den Doyt died on Saturday, at an early age. The value of his work was recognised by the French Government, and one of his paintings holds a place of honour in the Luxembourg Gallery.

Mr. Hamar Bass, M.P., has intimated his willingness to give £15,000 for providing a church and vicarage for the proposed new district of All Saints', Burton-on-Trent, on condition that an endowment of £300 per annum is raised. Towards this income Messrs. Bass, Ratcliffe, and Gretton have promised £3,000, and Lord Burton £2,000. Mr. Gretton is erecting a church at a cost of £20,000 at Stretton, on the outskirts of the borough, and at Horninglow, another suburb, Lord Burton has deposited £10,000 for a church, on condition that a similar amount is raised for endowment.



## Engineering Notes.

**BARNSTAPLE.**—Work is now in full swing on the new joint station for the London and South-Western and Lynton and Barnstaple Railways at North-walk, Barnstaple, which Mr. W. Gibson, of Exeter, will have completed in about four months. When the new station is finished, the site of the present station, opposite Cross-street, will revert to the town council, who, in the first instance, presented the land, and are now exchanging the North-walk site. The new station will be less convenient to persons residing at the centre and southern portions of the town, being several hundred yards more to the north, besides having no channel opposite by which access can be had from the town proper. In length the station will be 114ft., and in depth 21ft. A double platform, for the joint use of the two railways, will be 546ft. long, and covered and glazed throughout. The buildings will be of coarse rubble masonry, with Bath stone dressings.

**MIDLAND RAILWAY IMPROVEMENTS AND EXTENSIONS.**—Mr. M'Donald, the engineer-in-chief of the company, reports that during the past half-year 69 miles and 14 chains of road have been relaid with steel rails. The Chapelton branch extension is now completed between Chapelton and the Barnsley branch, with the exception of the stations and some ballasting and permanent way. Coal traffic has already been worked over it. The line to Wharnccliffe is in a forward state, and will be available for traffic from the Barrow, Rockingham, and Wharnccliffe collieries during the present half-year. The Wincobank North Curve was opened for traffic in December last. At Somers Town new coal depot the earthwork and most of the brickwork for this depot are now completed, and about one-third of the iron and steel work has been erected. Good progress is being made with the Kentish Town widening. The covered way under Kentish Town-road, and a long length of the retaining wall at the back of the station, have been completed. The covered way at St. Paul's-road, and the retaining walls at Camden-road Station, are also in hand. The contract has been let for the Heysham branch railway, and a good start has been made with the works.

**PETERHEAD.**—The engineers' report on the harbour of refuge for the year ended 31st March, 1896, has been published as a Parliamentary paper. During the year the south breakwater was extended 112½ft., the foundations of a further length of 60ft. were prepared, and 12 blocks of course "G" were set thereon. In addition 324 tons of rubble were deposited in the mound, and blocks containing 2,057 cubic yards of concrete and 10,719 cubic feet of ashlar were made, but not set. At the barge harbour the quay wall was finished, with the exception of a short length of coping which cannot be set until the embankment leading to the staging has been removed. The rock excavated from the bed of the harbour to form the new basin was as follows:—Above low-water level, 29 cubic yards; below low-water level, 4,129 cubic yards. The material was used for raising to quay level the land on the west side of the harbour. The quality of stone obtained from the quarry continues to be satisfactory. The daily average number of men and horses employed during the past year was as follows:—Free men, 150; convicts, 241; warders and guards, 32; horses, 1.

**THE INSTITUTION OF MECHANICAL ENGINEERS.**—The annual general meeting of the members of the Institution of Mechanical Engineers was opened on Thursday night, the 4th inst., in the hall of the Institution of Civil Engineers, 24, Great George-street, Westminster. Mr. E. Windsor Richards, the president, occupied the chair. The council in their report stated that the number of names in all classes on the roll of the institution of the end of last year was 2,360, as compared with 2,271 at the end of the previous year, showing a net gain of 89. The receipts during the year were £7,388, while the expenditure was £5,215. The president, in moving the adoption of the report, said the erection of the institution house on the site acquired at Storey's-gate, Westminster, was now being proceeded with, and the council had engaged to have it completed in 18 months. This was the jubilee year of the institution, which was formed 50 years ago in Birmingham, and it was proposed to hold the summer meeting in the city of its birth.

The institution was financially in a prosperous condition. Its capital was estimated at about £46,000; in 1895 it was £42,000, and in 1894 only £39,000. Alluding to the work of the Alloys Research Committee, he said it was admitted that everything must be done to bring scientific research into line with the practical application of knowledge to industry and commerce. The Institution had never lost sight of the importance of scientific researches, and the council, while fully alive to the necessity of economy at the present time, had voted a further sum of £250 to the Alloys Research Committee for extended investigations. The report was adopted. The officers for the present year were then elected, Mr. Richards being reappointed the president. Professor W. C. Roberts-Austen, C.B., F.R.S., afterwards submitted the fourth report of the Alloys Research Committee.

## CHIPS.

At St. Matthew's Church, Stratford, E., a new organ was opened on Thursday in last week. It has been built at a cost of £700, from designs by Mr. Hope Jones.

Cardinal Vaughan will visit Derby on Thursday in next week, the 25th inst., for the purpose of formally opening the new R.C. Church of St. Joseph, in that town.

At a meeting of Aberdeen Town Council on Monday, a special committee on the subject recommended that a site on the south side of Urquhart-road should be acquired at the price of £2,700 for the erection of a block of eight houses for workmen's dwellings, the rental to be £8 and £10. The report was adopted.

Mr. Thomas Farmiloe, senior partner in the firm of T. and W. Farmiloe, Limited, stained glass and embossing works, Rochester-row, Westminster, died on the 11th inst. very suddenly, aged 76 years.

The death occurred at Leek last week of Mr. Peter Tomkinson, who for many years was well known in that town as a joiner, builder, and contractor. The deceased, who was sixty years of age, died at Hungerford Villas, Sandbach, and was interred at St. Mary's Church, Sandbach.

The official opening took place on the 11th inst. of new offices connected with the Huddersfield Corporation gasworks. Some time ago, lack of space compelled the authorities to purchase for £800 blocks of buildings at the north-western corner of the works site. The premises purchased have been reconstructed under the direction of Mr. W. R. Herring, the gas manager, at a cost of about £600. Various offices and storerooms and a showroom have been provided, and buildings at the rear are being utilised for the whole of the outdoor departmental work, which requires the services of forty or fifty men. The total area, of which the premises form a part, is between ten and eleven acres.

At a meeting of subscribers held at Ipswich last week it was decided to commission the Hon. John Collier to paint a portrait of Mr. Felix T. Cobbold, the present mayor of the borough, and formerly M.P. for the Stowmarket division, to be hung in the mansion of Christchurch Park. Mr. Cobbold bought and generously gave the mansion to the town at the time when the park was purchased, and this is but one of his many donations to the borough, which was formerly represented in Parliament by his father and brother, both now deceased. The commission has been accepted by Mr. Collier. The Ipswich Corporation have accepted as a gift from the artist Mr. Fred. G. Cotman's oil-painting of Corfe Castle, which was exhibited at the Academy a few years ago; it will also be hung in Christchurch Mansion.

The Labour Department reports that, as a whole, the state of employment changed very little during January, there being, if anything, a slight falling-off. Compared with a year ago the most important industries, including the iron and steel, engineering and shipbuilding, and building trades, are better employed. Almost all the changes of wages recorded during the month were in an upward direction. In the 115 trade unions making returns, with an aggregate membership of 452,742, 14,842 (or 3·3 per cent.) are reported as unemployed at the end of January, compared with 3·2 per cent. in December, and with 4·5 per cent. in the 96 unions with a membership of 401,410, from which returns were received for January, 1896. At the end of January the building trades were scarcely so busy as in the previous month, owing to the weather; employment, however, was considerably better than a year ago. The percentage of unemployed in unions making returns for January was 2·4, compared with 3·7 in January, 1896. Employment in the furnishing trades, after a busy season, has now fallen off to some extent, compared with the previous month. The percentage of unemployed Union members at the end of January was 5·1, compared with 5·4 per cent. in January of last year.

## Building Intelligence.

**CARDIFF.**—An architectural fragment of which Cardiffians are proud is the Perpendicular tower of the church of St. John. The tower has long shown signs of decay, and on Friday the first actual steps were taken to effect its restoration. Scaffolds are being erected, and the work will be carried out under the care of Mr. C. B. Fowler, F.R.I.B.A., of Cardiff, the contract being in the hands of Mr. G. Shepton. Stone for the renovation will be procured from the same district (Dundery, near Bristol), where the original material was hewn, and as Mr. Shepton carried out the restoration of the rest of the church, and Mr. Fowler supervised it—everything will be in harmony. The foundation of the tower of St. John's was laid in 1473, and the architect was one Hart, who designed the fine towers of Wrexham and St. Stephen's, Bristol. The tower is 130ft. high; the doorway belongs to the early 13th-century church; the present street is more than 2ft. above the original entrance, which it dwarfs to this extent. It is some years now since the restoration of the church began. Four or five years ago the north and south aisles were added, and three years ago the organ chamber was built. Thus, the restoration of the tower completes the restoring of the church. In connection with the present contract the most important work will be the restoration of the south archway at the foot of the tower, the embattled parapets, the window strings, the cornice and turrets, the groining under the floors, and the glazing of the large west window. The present contract is only for the top, the windows, and the general structure, and amounts to close upon £2,000.

**HACKNEY.**—Lord Russell of Killowen on Saturday formally opened the set of public baths which have been erected in Lower Clapton-road for the parish of Hackney. The buildings contain men's first and second-class swimming baths, a ladies' swimming bath, 15 men's first-class slipper baths, 40 men's second-class slipper baths, seven women's first-class slipper baths, 20 women's second-class slipper baths, and vapour, spray, and shower baths. There are also establishment laundry, boiler-house, electric installation, superintendent's residence, and the usual offices. The men's first-class swimming bath has a water area of 120ft. by 40ft., and a capacity of 150,000 gallons. The cost of the whole establishment has been £65,000. Messrs. Harnor and Pinches were the architects, Messrs. Kirk and Randall the builders, and Messrs. Fraser and Son the engineers.—The Hon. Walter Rothschild laid on Sunday the foundation-stone of the South Hackney Synagogue and class-rooms about to be erected in Devonshire-road, Mare-street, Hackney. The new buildings, of which Mr. Delissa Joseph, F.R.I.B.A., is the architect, and Messrs. Brown, Son, and Bloomfield are the builders, will occupy a frontage of about 93ft. to Devonshire-road, and will comprise a lower ground-floor consisting of nine class-rooms and an assembly-hall, accommodating 400 children simultaneously, and lavatory and cloak-room accommodation for boys and girls. The upper ground-floor will be the main floor of the synagogue, and will be approached by a separate entrance from the street. It will contain accommodation for 340 males; the whole of the seats will be placed cross-ways, and the ark, pulpit, and reading platform will be grouped together at the eastern end of the building. Two self-enclosed staircases will lead direct from the street to the gallery, which will contain accommodation for 210 ladies, and two sets of cloak-rooms. The total cost will be £7,350.

**ISLE OF THANET.**—Sunday last was fixed upon for the reopening of the chancel at St. Peter's church, after the completion of the extensive decoration and restoration. In the years 1871-2 the restoration of the roof of the nave and aisles of the church was carried out; in 1887 the restoration of the tower, the recasting and rehanging of the bells (which were increased to eight), and the provision of a new clock, was undertaken, and now the restoration of the chancel roof, with mosaic designs for the chancel arch and east window, completes the restoration. The cost of the first two schemes amounted to over £1,200 each, while that just completed has cost £1,020. The coved ceiling of the chancel is divided into five main bays by ribs, which retain their original vigorous colouring of alternate gold and chocolate bandings, and white and black



fillets; a similar rib at the ridge, with pendant bosses at the intersections; the cornices at the top of the walls are also ancient, and have furnished the key-note of the decoration. The ceiling between has been covered with pitch-pine boarding, which has been slightly darkened as a ground-work. The three central bays have on each side a figure of an angel holding a shield bearing a monogram. These angels are the work of Miss Maud Seddon (the daughter of the architect). The easternmost bay, that over the sacrum, has on each side three smaller angels with outstretched arms, and the westernmost bay has on each side six half-length figures of the Apostles, seated on thrones, with gilded and diapered backgrounds. All these, together with the full-sized cartoons for the mosaic work, are the work of Mr. Henry G. Murray. Stencilled borders have been formed on either side of the vertical ribs, the work of Mr. G. Stollé. The eastern wall of the chancel has been covered with Rust's glass mosaic, and has a figure of St. Peter on one side of the east window, and on the other of St. Andrew, both under canopies; angels bearing scrolls with inscriptions fill up the spandrels above the window, and there is a similar treatment in the same material of the east wall of the nave. The whole work is from the designs of Mr. John P. Seddon, of 62, Albany Mansions, Albert Bridge, and has been executed by Messrs. Belham and Co., church decorators, of 155, Buckingham Palace-road, London, with the assistance of the several artists above named.

Mr. M. Temple Wilson, Alnwick, architect, has been instructed by the rural district council of Alnwick to prepare the necessary plans for the substitution of an iron bridge for the wooden one at present spanning the river Aln at Lesbury, which the sub-committee appointed to examine has reported to be unrepairable.

A new bridge erected over the Dubbs Burn, near Hedgeley, has now been taken over by the Northumberland County Council, whose subscription towards the cost has been paid to the Alnwick Rural District Council, the body on whose initiative the undertaking has been carried through. The Alnwick Rural Council instructed Mr. George Reavell, jun., architect, Alnwick, to prepare plans for the structure and its necessary approaches, and these were approved, the waterway being 22ft. clear, and the roadway 18ft. between the parapet walls. The bridge replaces a ford on a modern road between Beanley and Hedgeley railway stations. The contract for the work was let after public competition to Messrs. J. and G. Green, of Warkworth, who carried out the work to the satisfaction of the architect, assisted in the inspection by Mr. R. Adamson, clerk of the works, and the work has been visited from time to time on behalf of the County Council by Mr. Kynnersley, the county surveyor. The stone, which is in blocks of large size, is from the Shepherds Law Quarry.

In a letter to the *Times*, Mr. Walter Crane expresses his indignation and regret that large and costly buildings like the Imperial Institute can be erected without any visible reason for their existence, while an adjoining national museum of unrivalled beauty and richness, with a great educational influence, might almost be said to have not where to display its treasures. Professor Aitchison, A.R.A., P.R.I.B.A., also writes to the same journal urging the Government to complete the façade of South Kensington Museum. "It is melancholy," he remarks, "that the fine site should be left in the condition of a contractor's yard, with nothing but blank walls and sheds, instead of proclaiming by a fine building to London and the world that it is the entrance to a museum which contains the best collection of works of art in Europe. The space now wasted is urgently wanted not only to display collections, but to render them useful to students and the public."

On the Feast of the Purification, the Bishop of St. Alban's dedicated with a special service the works that have been carried out under the supervision of Messrs. Milne and Hall in the nave, and Mr. J. Oldrid Scott in the chancel, of Buckhurst Hill Church. The nave roof has been raised, a low plaster ceiling having been removed, clerestory windows have been placed above the old wall-plate line, and a good, massive pine roof built in the place of the old flat one. A new chancel arch, designed by Mr. Scott, has taken the place of the old plaster one, which had no capitals or members. The chancel was lengthened some 12ft., and a very ugly east window—ugly both in style of architecture and in the drawing of the stained glass—has been replaced by a new one of five lights. The altar-table and the reredos have both been raised, and dignity has been given to the whole building.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**THE ARCHITECTURAL ASSOCIATION OF IRELAND.**—The first of a series of visits to buildings was held on Saturday last, when, by the kind permission of the architects (Sir T. N. Deane and Son), the party were conducted over the new lecture theatre of the Royal Dublin Society, by Sir T. N. Deane. On Monday evening, at the advanced class of design, Mr. G. J. O'Callaghan criticised the designs submitted for "A Village Public House." The next subject, to be criticised by Mr. T. Drew, is a "Small Country Church." On Tuesday evening the ordinary meeting was held at the Grosvenor Hotel, Mr. R. Caulfield Orpen, president, in the chair, and among the visitors were a number of the medical profession, who took part in the discussion, the subject of the lecture being "Hospitals, and Hospital Construction," by Mr. F. Batchelor. The lecturer drew attention to the fact that Dublin stands second in the United Kingdom in the proportion of hospital beds to the population. London stands first, and Edinburgh third. Of the Continental cities, Rome occupies first place with about three times the number of Dublin in proportion to the population. The lecturer then described the various types of hospitals in the United Kingdom and on the Continent, and after describing them, he went fully into the construction, accommodation arrangements, methods of heating and ventilation, and various other points of interest. Mr. George M. Ross having proposed, and Mr. G. P. Sheridan seconded, the vote of thanks, which was heartily carried, a discussion ensued in which Mr. Jameson Johnston (City of Dublin Hospital), Mr. Rawson Carroll, and Mr. F. Hicks took part. The chairman having announced the next subject for the advanced class of design, "A Cottage Hospital," to be criticised by Mr. F. Batchelor, the meeting terminated.

**THE AUCTIONEERS' INSTITUTE.**—The papers selected by the committee in the students' competition were read by their authors at the lecture-room of the Auctioneers' Institute of the United Kingdom, Chancery-lane, on Monday night. Mr. J. F. Field, president of the institute, who occupied the chair, explained that, with a view to encourage the junior members, a fellow of the Institute offered a prize for an essay on a subject to be chosen by the council, whereupon other members of the council offered second and third prizes, if, in the judgment of the committee appointed by the council to adjudicate, the papers sent in deserved three prizes. That was the first venture of the kind. In that case there were five or six papers sent for the decision of the committee, and all of them had some merit, but two of them the committee adjudged of greater merit relatively than the others. The candidates were invited there to read their papers, because the first prize was not to be given to the author whose paper might be the best composition, but in which a skill in dealing with the subject also had to be observed. Three subjects were given, but all the candidates had chosen the subject, "The Auctioneer: his Duties and Responsibilities." The Committee of Adjudication consisted of Mr. Parkes, Mr. Healy, of Manchester, and himself. The first paper was read by Mr. H. H. Arnold, of Norwich, and the second by Mr. J. E. Kitchen, of Leeds. A discussion followed.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—This association, by permission of the Edinburgh School Board, visited on Saturday the new proposed school at Broughton, under the leadership of Mr. Robert Wilson, architect. The school is built upon the site of Blackfield House, and consists of a central block with a wing at each side. The central block contains the principal classrooms, entering from a combined boys' and girls' staircase, and in the wings are the teachers' private rooms and cookery and laundry classrooms. There is a total accommodation for 1,358 children, provided at a cost of about £24,000, exclusive of the site. In the basement are situated the gymnasium, swimming-bath, boiler-house, and engine-room. The visit was brought to a close by a vote of thanks to Mr. Wilson for his interesting explanation.

**NOTTINGHAM MASTER BUILDERS' ASSOCIATION.**—Under the presidency of Mr. Enoch Hind, the members of the Nottingham Master Builders' Association sat down to the annual dinner at the Albert Hotel, Derby-road, the other evening. There were about seventy in the company. The vice-president, Mr. James Wright, ex-Sheriff, proposed "Success to the Master Builders' Asso-

ciation." He thought they might congratulate themselves that the association, which had only been started about five years, had been a success. The past year had been one in which they had several little, and some rather serious, troubles, the masons, plumbers, joiners, and other trades having been on strike. They had had no fewer than sixty-two meetings during the year. In order to cope more effectually with the difficulties which might probably arise, they had reconstructed the association. They had now a committee appointed to deal with each branch of the trade, and every member of the association was on one or more of the committees. Although they could not do anything to check competition, they might do something to control the conditions under which contracts were carried out, and he hoped that the new reference committee would stick heartily to the work. Mr. Woodsend and Mr. Hodson replied. Mr. G. Fish submitted the toast of "The Chairman," which was drunk with musical honours. The chairman, in reply, said it was twenty-six years next month since he first joined a Master Builders' Association in Nottingham.

## CHIPS.

On Friday last, Mr. Walter A. Ducat, an inspector of the Local Government Board, held an inquiry at the Charity Schoolroom, Burnham, Essex, into an application by the rural district council for permission to borrow £250 for works of sewerage and sewage disposal, and £200 for works of water supply. Mr. H. G. Keywood, engineer and surveyor, explained the proposals.

A new recreation hall, which has been built at the Royal Victoria School for the Blind, Benwell Dene, Newcastle-on-Tyne, was opened on Saturday. The designs for the hall were prepared by Mr. W. Lister Newcombe, F.R.I.B.A., of Newcastle, and the work has been carried out by Mr. Pringle, of Gateshead, contractor. The interior dimensions of the hall are 50ft. by 20ft.

At Colchester on Tuesday week, Mr. W. A. Ducat, Local Government Board Inspector, held an inquiry as to the application of the Town Council to borrow £600 for the purpose of erecting a new pavilion on the recreation ground. At present there is only a little thatched building in a very dilapidated state and sanitary arrangements are not good.

A meeting of the Lancaster Town Council was held in committee on Friday, at which it was proposed to purchase property in Dalton-square containing 5,500 square yards, for public purposes, as a memorial of the Queen's Diamond Jubilee. The property in question has long been looked upon as a suitable site for public buildings, and the need for a new town-hall, police-court, and municipal offices has been much felt. The erection of a large public hall on the site was also considered as part of a further scheme of municipal buildings. The matter was eventually adjourned, after a long discussion.

Mr. John Grant, of Victoria House, Montpelier, and formerly for many years a resident of Hampton House, Redland, Bristol, died on Friday. Mr. Grant belonged to an old Bristol family, his forefathers being freemen of the city early in the 17th century. He was engaged as a master builder for over fifty years. Many business premises in the city and villas in the suburbs were erected by him.

It is announced that Mr. Passmore Edwards is going to dedicate the new Central Technical School at Truro to the memory of Sir Charles Lemon, of Carlew, who formulated a similar scheme in 1838.

Mr. C. C. Smith, who has for some time past acted as clerk of works for the Wakefield Corporation at Green Withens reservoir, has been appointed waterworks engineer instead of Mr. R. Porter, the city surveyor, who has hitherto discharged that duty.

The new church of St. Peter, at Bocking, Essex, now in course of erection from plans by Mr. J. T. Mickelthwaite, F.S.A., of Westminster, will be consecrated on the 19th of June next.

The Edinburgh School Board adopted, on Monday, plans prepared by Mr. Robert Wilson, their architect, for the enlargement of the South Morningside School, from 647 to 1,354 places, it being stated that large numbers of new tenements were being built in that southern suburb.

A townsman of Southampton has offered to give £5,000 towards the building of a new town-hall for that borough in commemoration of the Queen's record reign if 19 similar donations are made. A town-hall has long been required, but the expense has been too great. The Mayor of Southampton has issued invitations for a meeting to consider the most fitting means of celebrating the event, and an effort is to be made to raise £20,000 to extend the Royal South Hants Infirmary.



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ST. SAVIOUR'S CATHEDRAL CHURCH, SOUTHWARK.  
For description and plan see pages 268-9.

NEW OFFICES FOR THE ROCHDALE EQUITABLE PIONEERS SOCIETY, LIMITED.

THESE illustrations show additions to the central premises of the above society. On the ground floor is the general office, 43ft. by 42ft. by 20ft. high; the members enter through the doorway at the high part of the street, and, as at dividend payment seasons there is a large crush, a great amount of standing space is devoted to the members, who retire by the passage at side of existing building; provision is also made on this floor for the manager and cashier. The upper floor is occupied by the board-room and three committee-rooms. The staircase shown near the entrance is an auxiliary staircase to the present building in case of panic; it tops every floor, but is principally intended for the use of the assembly-room, which is situated on the fourth floor, and has at present very inefficient means of egress. The stair is constructed with Hawksley's patent treads. The dynamo house supplies the electric light, not only to these premises, but to the other buildings of the society, some hundreds of yards down the street. The floors are fireproof throughout, the space for public being finished in tile and the space for clerks in wood blocks. Strong-rooms and book-storage are provided in the basement. The walls are faced with pitch-faced parpoints and ashlar dressings. The builder is Mr. T. Crabtree, of Rochdale, and the architects are Messrs. Butterworth and Duncan, of the same town.

"BUILDING NEWS" DESIGNING CLUB: A VILLAGE SCHOOL.

THE conditions issued for the use of competitors need no introduction. They were as follows:—"C.—A Small Village School for Parochial Purposes.—The buildings to be erected in stone by the roadside on a site only sufficiently large to accommodate the premises, the playground being on the other side of the way. The frontage line to set back 15ft. from the boundary next public pathway. The district is a hilly one in a stone country, and the fall of the ground line is 1 in 14 from N. to S., the frontage facing west. The large schoolroom is to be of 900ft. super. in area, and two classrooms opening out of it 350ft. super. each. A lavatory and one w.c. for each sex, with separate cloakrooms, but only one main entrance to the school required. A residence for the mistress is to be attached, having small parlour, good kitchen, and two bedrooms, with suitable offices, and back entrance or side-way. A bell-turret to be made a feature of in stone. Roofs covered with big stone slates. Plain dwarf wall to inclose front garden space. Scale 8ft. to the inch, but

the plans may be smaller if desired. Two elevations, plans, one section and view."

"Nap" is by far the best, and displays a knowledge of the seating and lighting with reference thereto, which is of prime consequence in planning a school. There is a business-like air about his building, which is compact in its arrangements. The elevation is simple and suitable, which is saying much; but "Nap" is strongest in his plan. "Pickles," who comes second, has merits, and draws with care, though his design hardly reaches his previous standard, leaving us less to recommend him for than usual. The limited character of the scheme has not been realised quite so well as could be wished, the perspective suggesting, too, a triangular plot. The alternative for the bell turret, seen in the view, is hardly an improvement. "St. Leonard" does not obtain the third position easily, but we place him there more for his elevation than his plan, though we realise that some competitors, particularly those who are weak in design, will consider plan should always outweigh all other considerations. "St. Leonard" places his classrooms at the ends of his school-room, giving a total length, when all are used as one apartment, of over 80ft., with a width of about 20ft. The windows to the right-hand classroom do not agree in elevation with the plan.

"The Dingo" is determined to cultivate the Later Renaissance. He does so by no means unpleasantly, and his plan has distinct points of merit; moreover, he draws with neatness and thoroughness. The style hardly adapts itself, however, for present uses of this class, and we cannot say that the author is well advised to adopt so odd a mannerism with so scant attention to good proportions. His window-sills are too high above the floor, and ought to have a splay on the inside face. "Tyke" sends a compact plan picturesquely grouped and treated like a school; but two turrets on one building of so limited a character are hardly necessary. In drawing the effect is rather patchy and restless. Shield on a cartouche is the device of a rather nice plan with the entrance at the angle more clever and ingenious than really good. The school and classrooms are properly associated, but we cannot commend the exterior treatment. The shape of the big school roof is not a happy one, and would make an excessively ugly gable end. "Pickwick" is very simple in his architectural taste, and the general scheme of his plan is not bad, though his work lacks thought in its details. A little more care and attention to practical requirements would lead to the author's advancement. "Moss" is unequal, and seems to be endeavouring to reach a degree of originality. At present his attempt seems crude, though it avoids the commonplace, and externally the grouping evinces taste. The tunnel-like entrance to the teachers' house is quite out of place and looks barbaric. "Pantile" is not a success, and fails to realise the idea of a school-house in his plans, though the elevations are more suitable. For them alone we place him in this position, but his perspective is a poor performance. "Cheese" is very painstaking, and for a view gives a sort of bird's-eye cleverly handled. His fault is a lack of simplicity, and with attention to our suggestions no doubt the author of this set of drawings will improve. One item by way of illustration. The girls' w.c. door opening immediately in front of the cloakroom fireplace is not a neat arrangement. "Geisha" draws his perspective as if the school were located midst mountains of snow, and the elevations do not sufficiently suggest a stone treatment. The plan hardly calls for comment, and has no claim to originality, but, for all that, it displays care. "Novocastrian" is not a good planner, and hardly realises relative values. The two classrooms, like transepts, give a tee-shape to the plan. The conveniences are cramped near the entrance, which is emphasised by a spire-capped turret, ill according with the other parts of the building. The school by "Lancastrian" is too ambitious and odd, reckless of cost and regardless of cubical contents, every foot of which means expense. "The Wolf" is neat, and his elevations, if somewhat weak, look unambitious and fairly like what they should be. His drawings are thin and wanting in spirit, so that they scarcely do him justice. "Oblivisci-non-Possum" is undoubtedly painstaking, and avoids no care to do his best. The hollow walls internally hardly seem necessary, and the plan of the school is very ill-managed, with the lighting badly contrived. "Ard" is rough and careless, but his plan is better than the last, though the sanitary arrange-

ments are strangely defective. There is a more spacious air and sense of elbow-room about "Cameo's" plan, which accompanies, however, an indifferent pair of elevations and a thin skimping-looking perspective. "P." in a circle fails largely for lack of good draughtsmanship, inking in with a hesitating, wire-like line. His scheme is too ambitious and expensive; otherwise the balance of parts is picturesque enough. "Devonia," by using such pale ink, has failed to consider how heavy and dark the same sketch would look when reproduced in black printer's ink. The w.c. doors open in full view of the main entrance, and face each other for both sexes. The school and classrooms are well planned; but the big square hall in the mistress's home is wasteful and quite unnecessary. "Agon" gains nothing by depicting his school in a thunderstorm. The elevation with its double tier of windows resembles a factory. "Two and Two Make Four" covers too much ground, and has not realised our requirements. There is little over-elaboration, but economy in roofing has been avoided; indeed, the interior of the schoolroom roof would look very ugly. "Caakie" is a rough, crude draughtsman, adopting a mannerism which has nothing to recommend it, and the author of this design will make little advance till he has given more study to his work. "Whitefriar" lacks method and a good type to follow. Simple lines well befit the country, but the contours must be proportioned pleasingly to rise above the commonplace. In perspective the roofs are shown to a steeper pitch than the section justifies. The lettering of the title to "Whitefriar's" sheet is hideous. We cannot say much in favour of "Don," who has not attended to the conditions. His façades are restless and very spotty-looking, as if all the glass in the windows was broken. "Rex" is a little better, but his details will not pass muster. His sprawling, uncouth bell-turret would spoil any building. "Arch" ought to have taken a higher place; his industry is fully taken account of, but the classrooms in his plan are too isolated from the schoolroom. "Diver" comes next with his drawings on three sheets, so that if we wished to reproduce them we could hardly do so. "Hurst Park" exceeds the limit of size given, and draws on a card, which is contrary to regulations. "Jupiter" adopts a worn-out Gothic method, and spoils his laudable endeavour by a very poor plan with a pitch-dark passageway in its midst. The other designs are "The Manxman," "E. G.," "Toreador," "Don't Know," "Too Much Trouble," "Berkeley," "Rob Roy," "Monti," "Ingleside," "Eros," "Q.E.D.," "Halsted," "Charley's Aunt," and "Rock."

NEW WING TO TEMPERATE HOUSE, KEW GARDENS.

THE details and sections given to-day of the above complete the illustrations which appeared last week, when a full description was given.

## CHIPS.

A new Congregational church, providing accommodation for 400 persons, has just been opened at South Wigston, Leicester. The cost has been £1,600.

Contracts for the erection of a new Technical College in Paisley have been fixed, and have been secured principally by Paisley tradesmen. The building is to be built according to plans prepared by Mr. T. G. Abercrombie, architect, Paisley, and is expected to cost about £20,000. The site in George-street was given by the Messrs. Coats.

At the meeting of the Great Northern Railway Company, on Friday, Lord Hindlip, stated that it was proposed to expend £200,000 on new works in Manchester during the current year.

At Grimsby, on Friday, the Light Railway Commissioners held an inquiry into the scheme for a light railway from Grimsby to Saltfleet, the largest project of the kind in the country. The Commissioners decided that the scheme had not been sufficiently thought out to justify an order authorising its execution. The application for the present order, therefore, failed.

A new Wesleyan church has been begun at Exmouth, to hold 700 persons, and to cost over £6,000. Towards this over £4,000 is in hand.

The visiting committee of the Wilts County Asylum have resolved on the erection of a new boiler-house and other additions connected with the provision of steam for heating, cooking, and other purposes, and to raise by loan for such purpose, and for the installation of electric lighting at the asylum, a sum of £5,000.









Tarr longitudinal section.

E. G. RIVERS ARCHT

Office of Works.  
London.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. F. M.—J. L. and Co.—Afghan.—E. S. W.—G. Parkinson.—S. E. T. Co.

## "BUILDING NEWS" DESIGNING CLUB.

REGINALD G. KIRKBY. (You cannot send in designs for subjects already set and finished with. The current subject is open to you as a competitor, but you must comply with the rules of the Club, a copy of which was published on October 16, 1896.)

## Correspondence.

## AN UNWRITTEN CHAPTER OF ENGLISH ARCHITECTURAL HISTORY.

To the Editor of the BUILDING NEWS.

SIR,—It may be interesting to record that a reproduction of part of the plate referred to by Mr. Arthur S. Flower in a recent paper under this heading as "never exhibited before," may be found in Ashdown and Kitton's "St. Alban's, Historical and Picturesque" (1893). It is entitled "Building St. Alban's Abbey. Facsimile of a drawing by Matthew Paris." It has always struck me as representing a most dangerous state of affairs for the artificers, who work immediately under the arcades, over which a pair of rather clumsy-handed fixers are setting ashlar! In another part of the same exhaustive volume is a facsimile of another drawing by the same artist, representing the "Dedication of the Charter of St. Alban's Abbey by King Offa."—I am, &c.,

HARRY HEMS.

Fair Park, Exeter, February 15.

In the case of George Herbert Durrant, Upland Hall, Forest Hill, S.E., late Hart-street, Bloomsbury, W.C., architect and surveyor, the discharge from bankruptcy has been refused.

The Isolation Hospital, Ilford, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

## Intercommunication.

## QUESTIONS.

[11623].—Baths and Water Companies.—I should be glad if any of your correspondents could tell me if it was decided, in one of the London courts, to be legal to make special water charges for baths, in a case which was tried about two years ago?—A. S. I.

[11624].—Specialities.—Where these are specified, such as w.c. apparatus, ventilators, and other special fittings, can the proprietor, without the contractor's sanction, after acceptance of tender, order and pay for same, for the avowed purpose of obtaining the usual trade discounts, and have deducted from the contractor's amount of tender, or final bill, the price the latter has down in his schedule for same?—OBJECTOR.

[11625].—Materials.—Where a contract has been let, and the contractor has the option of getting the same from quarries in two districts, if of good quality, can the employers determine from which district they will have same, seeing the difference of cost of the two districts is considerable?—DOUBTER.

[11626].—Legal.—(1) What is the usual year's purchase for a half-share in an architect's business? (2) How many years should be taken for the average? (3) If one of the partners was not fully qualified, ought he to pay more for the purchase? (4) How is work in hand charged for? (5) Is it usual to pay the purchase money to the other partner absolutely for his own use?—H. A. C.

[11627].—Upholsterer's Oven.—An upholsterer requires an oven wherein he can place chairs, &c., the padding of which is affected by insects, grubs, &c. Does any reader know of such an oven? It must be hot enough to destroy any microbes in the padding of the furniture, and yet there must not be so much heat as to damage the furniture.—SANITAS.

[11628].—Materials and Labour.—In the case of a tender having been accepted for materials and labour, and after the work has been commenced the proprietor takes objection to the materials delivered, is he at liberty to order same and deduct the amount from that which in the ordinary way would become due to the contractor if the work was carried out in the usual manner?—FAIRBANK.

## CHIPS.

Mr. Hy. Harper, Market-place, Nottingham, has been appointed architect for the proposed new Primitive Methodist church and schools, at Royton, near Oldham.

A very large Cambridge quarter chime clock was set going at Mossley Hill Parish Church, Liverpool, on Monday evening Feb. 15th, 1897. The clock is constructed on a horizontal cast-iron bed frame, fixed on strong cast-iron brackets bolted to the tower wall. The escapement is Lord Grimthorpe's double three-legged gravity, with compensation pendulum  $1\frac{1}{2}$  seconds, and a bob of about 500lbs. weight. The specification was drawn out by Mr. R. Bushell, J.P., of Liverpool, who superintended the erection, and the work was carried out by Messrs. W. Potts and Sons, clock manufacturers of Leeds and Newcastle-upon-Tyne.

The Grand Duke of Hesse has appointed Messrs. Baillie Scott and Seton Morris, of 30, Gt. James-street, and Douglas, Isle of Man, as his architects for the decoration and re-modelling of certain rooms in the Palace at Darmstadt. We understand that the work is to be proceeded with immediately.

Lord Salisbury received at the Foreign Office on Monday a deputation of representatives of science, who asked the Government to establish a national physical laboratory at a cost of £30,000 for buildings and £5,000 a year for maintenance. Lord Lister, Professor Rücker, Lord Rayleigh, Sir Douglas Galton, Mr. J. Wolfe Barry, and Sir A. Noble having set forth the views of the deputation, Lord Salisbury expressed his entire sympathy with the object it was desired to attain, but his inability to pledge the Chancellor of the Exchequer in the matter. He suggested the expediency of limiting the scope of the proposed laboratory, in the first instance, to the work of standardising, which was strictly a function of the State.

At a meeting of the improvement committee of the Gloucester City Council, plans for a new theatre and opera house, which a London syndicate are about to erect on the site opposite the Municipal Schools in Brunswick-road, were submitted and passed. The plans, which have been prepared by Mr. John P. Briggs, of Effingham House, Arundel-street, Strand, disclose a handsome building of brick and terracotta. Seating accommodation will be provided for 1,500, and from each seat there will be a clear and uninterrupted view of the stage.

Damage to the extent of £20,000 was caused by fire, on Friday, to the Dominion Parliament buildings at Ottawa. The departments of Public Works, Marine, Fisheries, and Mounted Police were practically destroyed.

The assembly-rooms and other portions of the interior of the town-hall at Yarmouth have just been decorated in colour. The building was erected about 17 years ago from designs by Mr. G. Bond Pearce, of Norwich, and the present works have been carried out by Mr. James E. Dyson, of Nelson-road, South Yarmouth, at a cost of about £520.

## WATER SUPPLY AND SANITARY MATTERS.

HYDE PARK CORNER.—Public conveniences have just been erected by the vestry of St. George, Hanover-square, in Hyde Park, opposite St. George's Hospital, upon a site granted by H.M. Office of Works. Provision is made for separate conveniences for men and women. The men's department is underground, and is built of brickwork faced inside with white glazed bricks. It is surrounded above the ground level by a parapet wall faced with Bath stone in coursed ashlar, finished with a moulded cornice of brown Portland stone. It has two staircase entrances, each fitted with Bostwick's patent collapsible iron trellis gates. The entrance from the Park is lined with ceramite or glass-faced bricks. Twelve water-closets, 32 urinals, one lavatory with six wash-basins, and an attendant's room situated in the centre of the building, are provided. The water-closets are of the pedestal pattern. The urinals are semi-circular fireclay backs in enamel, with polished St. Anne's marble divisions. The lavatory is lined inside with ceramite or glass-faced bricks, and is provided with six tip-up basins and receivers, provision being made for the supply of hot and cold water. The women's department is built entirely above ground, and is similar in architectural character to the adjoining and other lodges in the park. It is of Grecian design, and is built of brickwork, faced on the outside with Bath stone in coursed ashlar; the columns, pilasters, cornices, and other dressings being of brown Portland stone. The roof is covered with lead, and has a central copper-covered dome, forming an octagonal lantern inside, having sashes glazed with ornamental lead lights. The woodwork is pitch-pine, stained and varnished. The building consists of a central hall, or waiting-room, with projecting wings, and contains twelve water-closets, a lavatory with four wash-basins, and an attendant's room; the fittings in this department are similar in all respects to those in the men's department. The entrance, which has a covered portico with fluted Grecian columns, is in the Park, but has an approach from Knightsbridge. The floors in each department are laid with terrazzo or Venetian marble mosaic, and with borders in Roman mosaic. Both departments are fitted throughout with the electric light. The sanitary work has been carried out by Messrs. Doulton and Co.; the electrical installation by Messrs. Ridout and Co., the current being supplied by the Westminster Electric Supply Corporation. The works have been executed by Messrs. Patman and Fotheringham, at a contract price of £6,473, from plans and specifications prepared by, and under the supervision of, Mr. George Livingstone, surveyor to the vestry, and his chief assistant, Mr. C. S. Milner, A.M.I.C.E.

LEEDS SUMS.—The sub-committee of the Leeds Corporation, specially appointed a short time ago for the purpose of making recommendations as to the best manner in which to deal with the property in the "insanitary areas" of the city, met at the Leeds Town Hall recently, and discussed details connected with the scheme for dealing with the property situated in the York-street area. According to the Housing of the Working Classes Act, the corporation are bound to provide dwellings for a certain proportion of the inhabitants whom they displace by the demolition of insanitary dwellings. In the present case the Leeds Corporation are compelled to provide housing accommodation for 2,000 persons within a reasonable and convenient distance of the area cleared. The committee favoured the idea of building the tenement houses on the Ivy House Estate, a site belonging to the corporation, adjoining the East End Park, and it was resolved to obtain the opinion of the Local Government Board on the subject. As to dealing with the property in the condemned area, the committee appointed two sectional committees for negotiating with the property owners affected by the scheme, together with valuers. The engineer to the committee (Mr. Carter) was instructed to visit Barrow and Manchester, to inspect the tenement dwellings that have been erected by those corporations, and to report thereon to the next meeting of the sub-committee.

Mr. Robertson, consulting engineer to the East Indian Railway Company, has been appointed president of the Egyptian Railways Administration in the place of the late Halton Pacha.

At the last meeting of the town council for Gravesend, the town-hall and market and committee reported that they had settled the form of instructions to the three competing architects approved by the council. It was stipulated that the total cost must be under £2,000.

The governors of the Wolverhampton Grammar School have let the contract for the erection of new science buildings to Messrs. H. Willcock and Co., builders, of Wolverhampton. The cost, including the furnishing of the laboratories, is estimated at about £2,000.

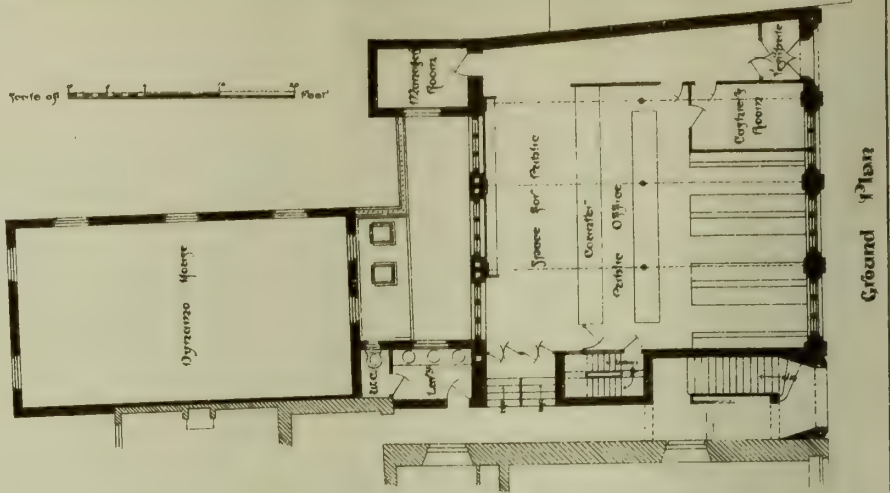






NEW OFFICES  
TOAD LANE, ROCHDALE  
FOR THE  
ROCHDALE EQUITABLE  
PIONEERS SOCIETY  
LIMITED.

Scale of 1" = 10' 0"



Ground Plan

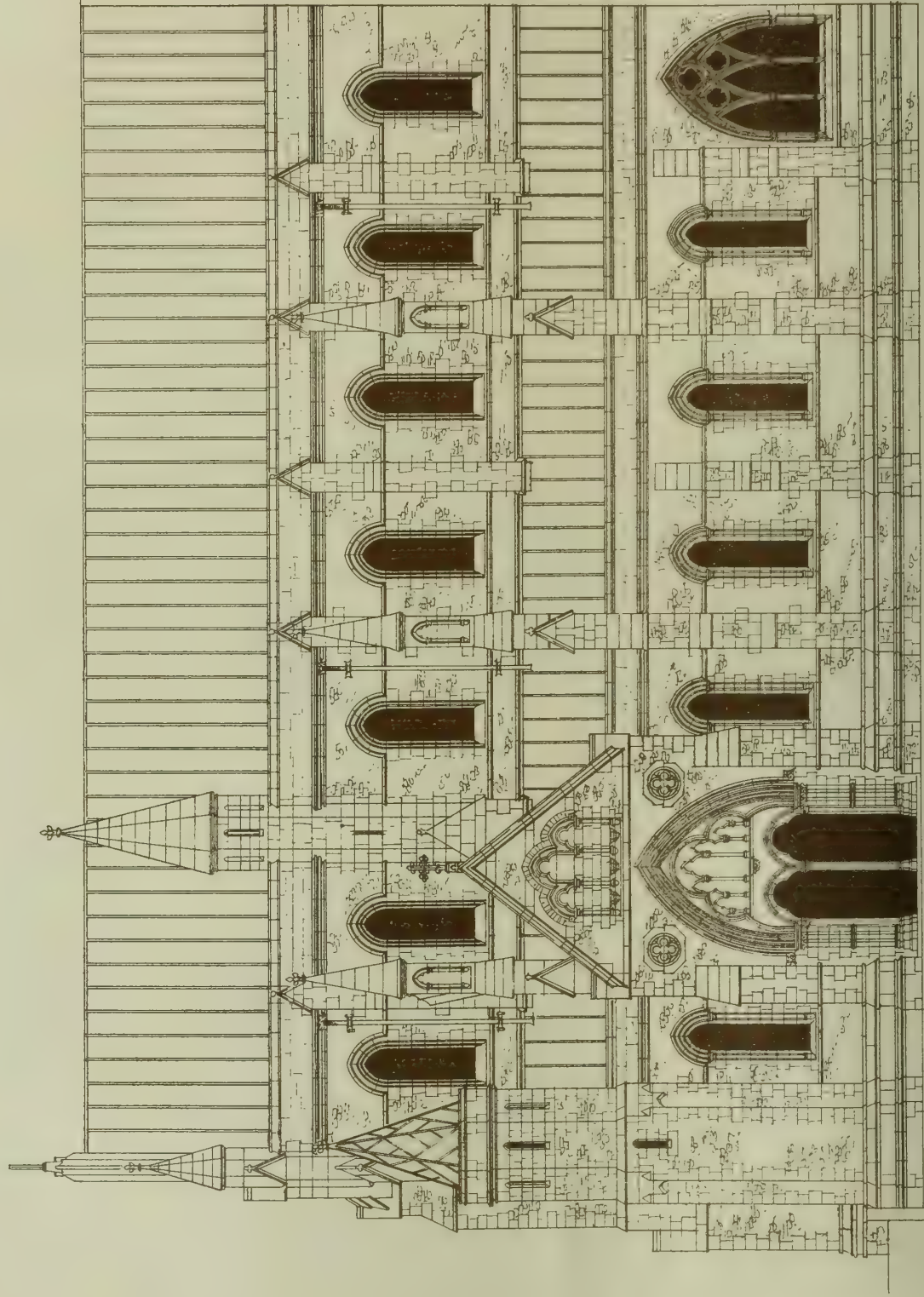
MESS<sup>RS</sup> BUTTERWORTH & DUNCAN  
ARCHITECTS.











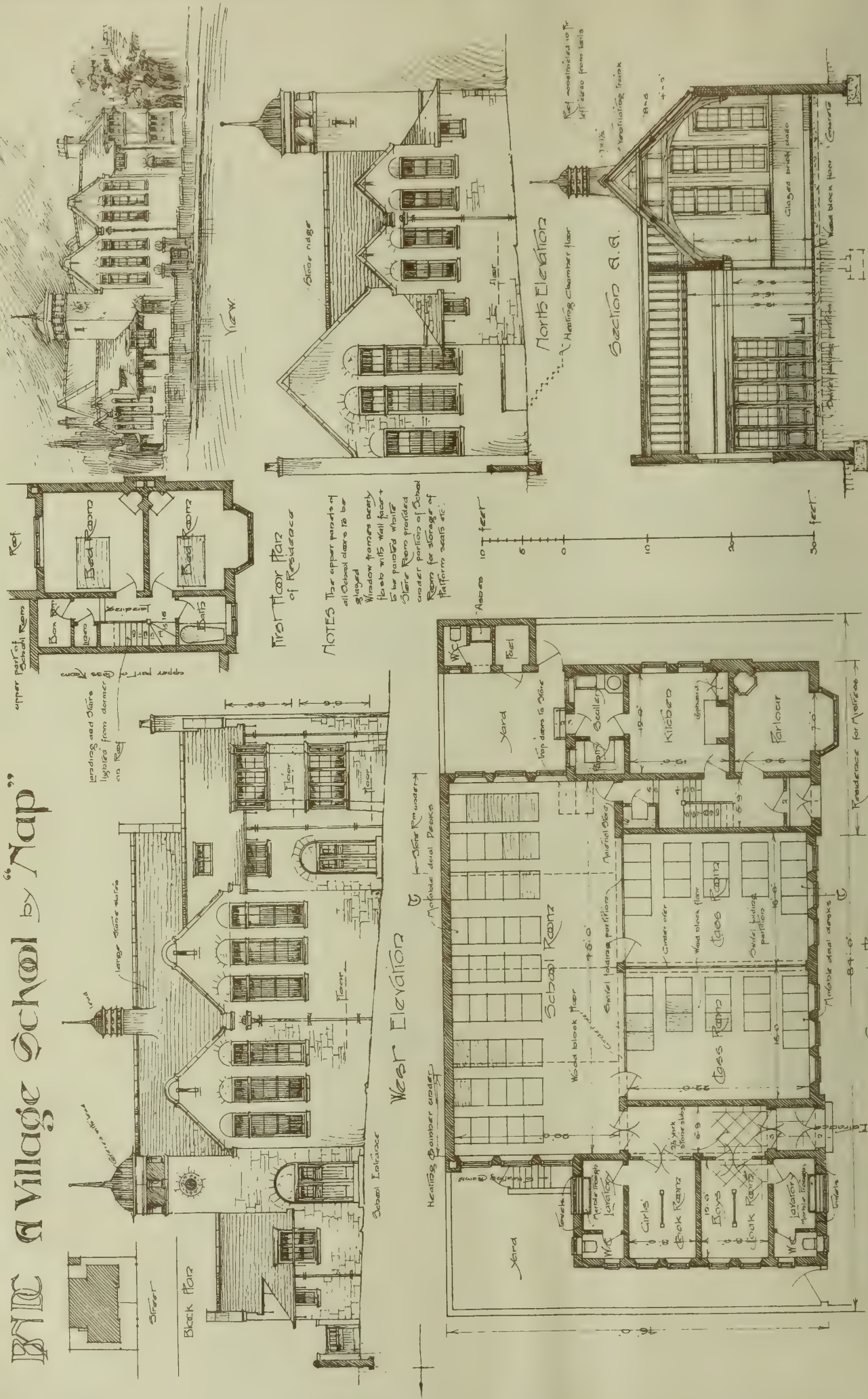
SOUTH ELEVATION.







BY THE Village School  
by "Nap"



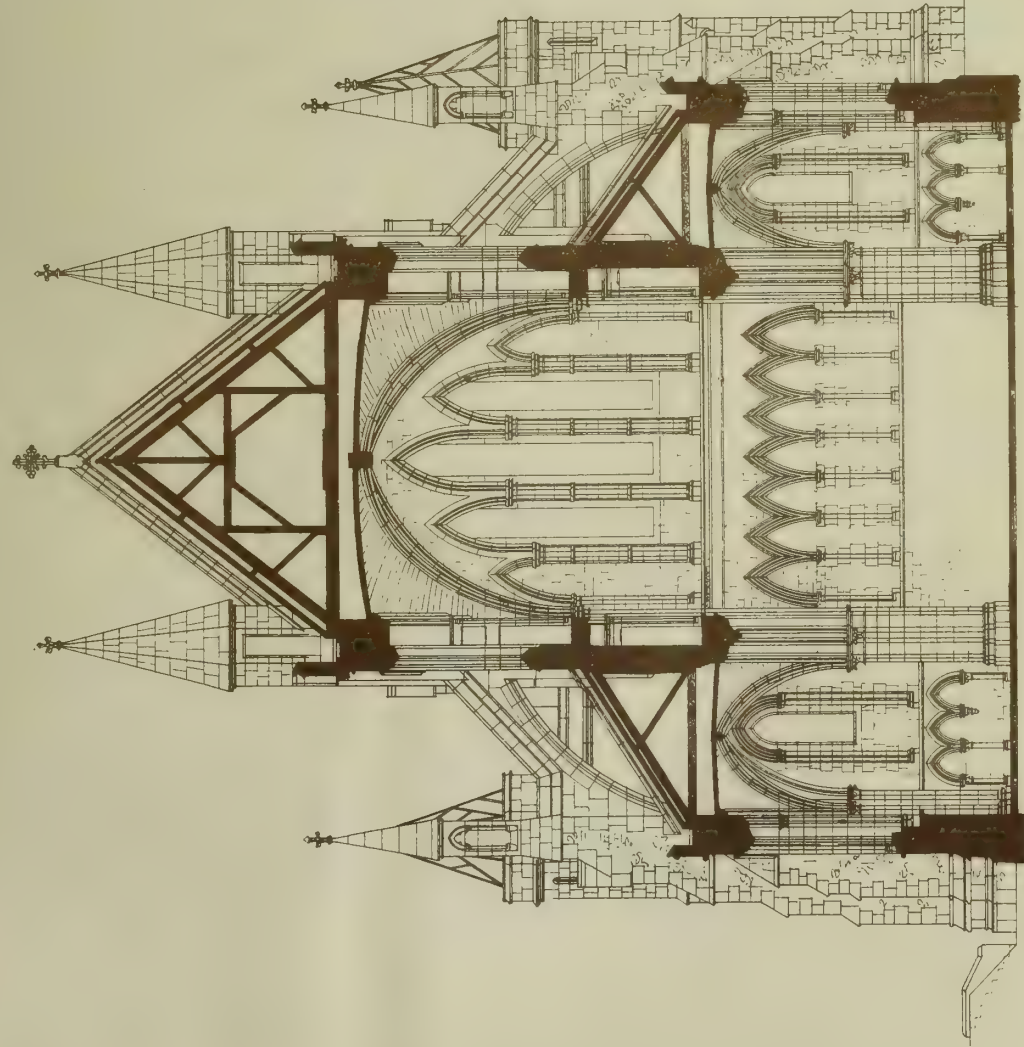
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ST SAVIOURS CATHEDRAL SOUTHWARK  
OPENED IN THE PRESENCE OF H.R.H. THE PRINCE OF WALES  
FEB. 16 1897

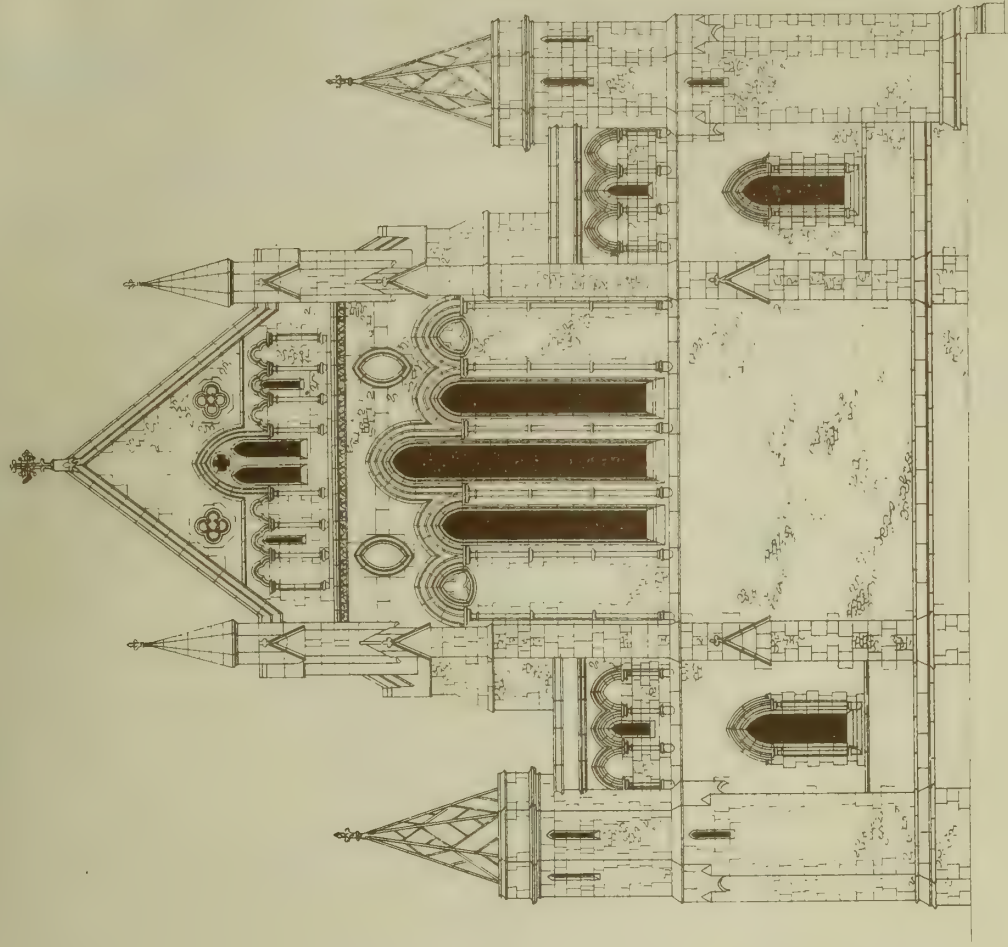
SIR A. BLOMFIELD, ARCHT.



CROSS SECTION

LOOKING WEST.

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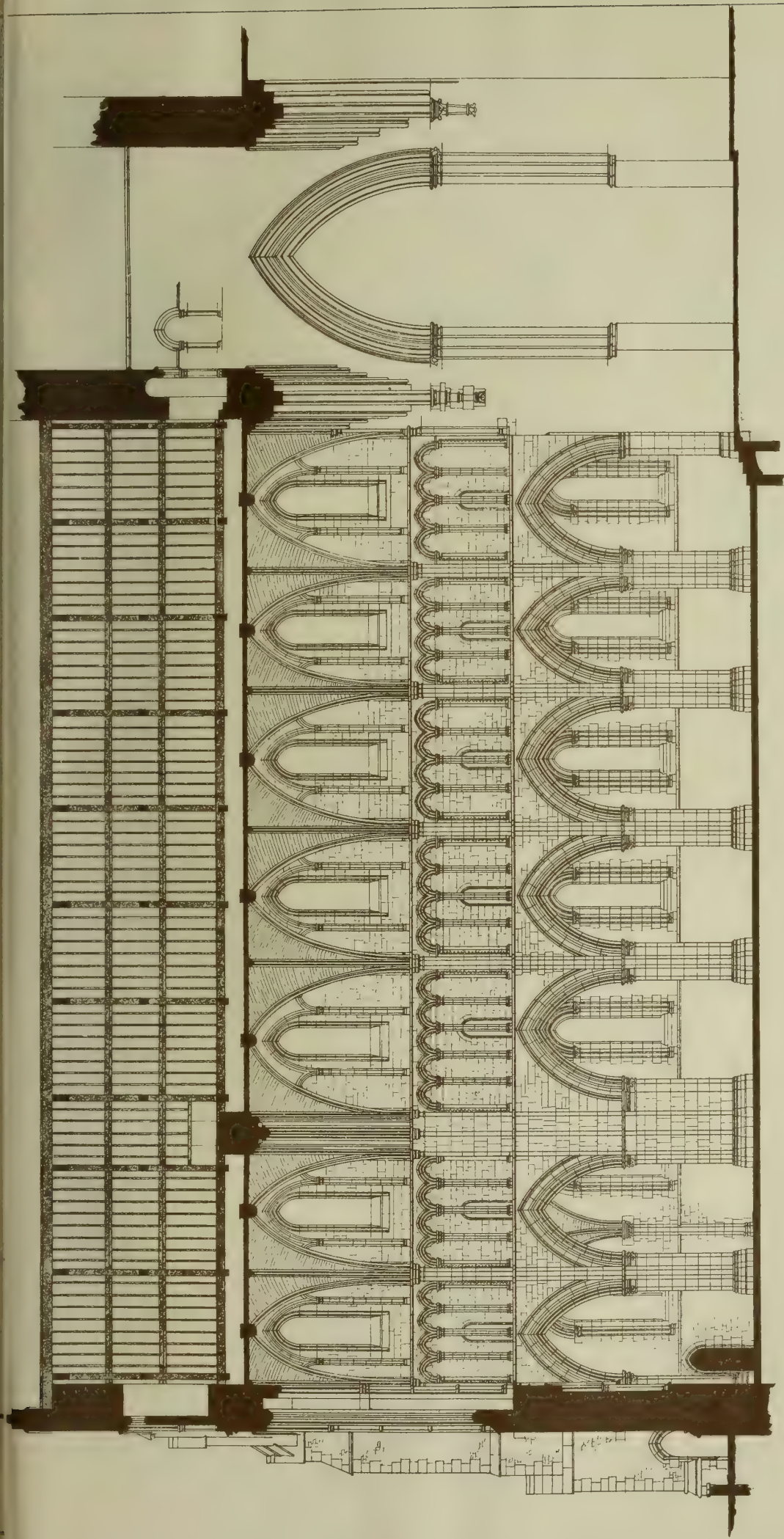
WEST ELEVATION

Scale of 0 10 20 30 40 50 60 70 80 Feet









ST SAVIOUR'S CATHEDRAL CHURCH SOUTHWARK  
 OPENED IN THE PRESENCE OF H.R.H. THE PRINCE OF WALES

FEB. 16. 1897

SIR A. BLOMFIELD, ARCHT. & SONS ARCHTS.

Scale of Feet 0 5 10 20 30 40 50 60 70 80 Feet

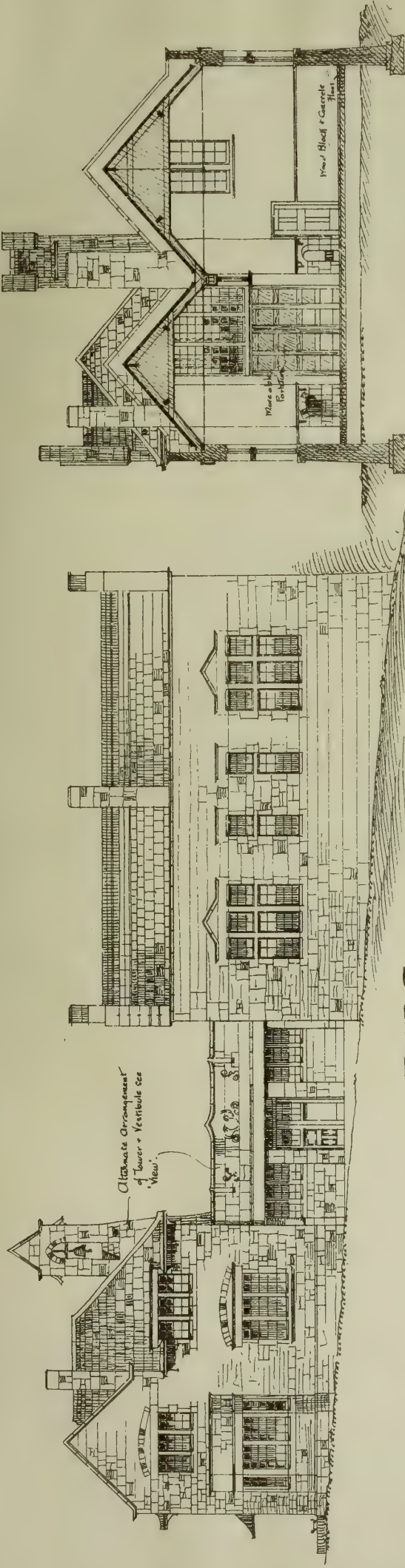




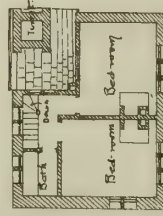


# : B.N.D.C. : A SMALL BY VILLAGE SCHOOL :

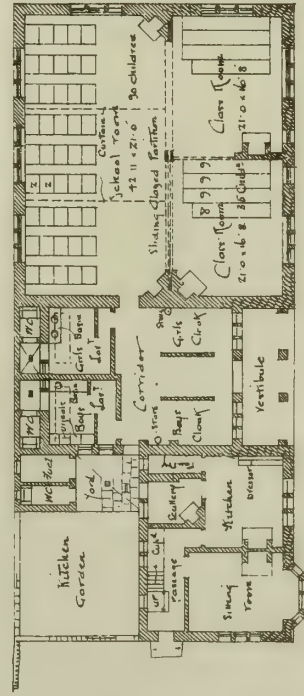
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FRONT ELEVATION:

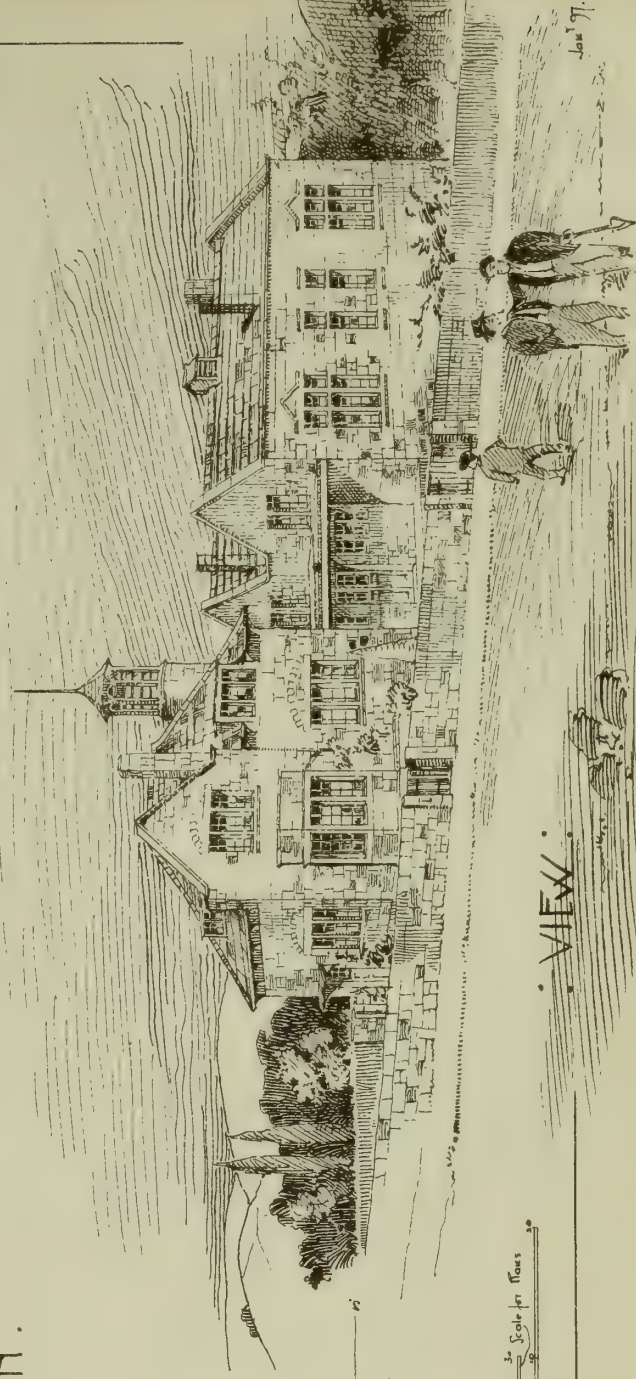


UPPER PLAN:



GROUND PLAN:

Scale for Plans 1" = 10' 0"



VIEW:







## LEGAL INTELLIGENCE.

**BUILDING BY-LAW APPEAL.**—In the Court of Appeal, on Friday, before the Master of the Rolls, Lord Justices Lopes and Chitty, the defendant's appeal was heard in the action "Harrison v. the Yeaton Urban District Council." This was a case in which a Mr. Harrison claimed an injunction to restrain the district council from pulling down a coach-house and stable which was being erected on the urban side of Cemetery-road, on the ground that the space left was not of sufficient width. They contended that if the building should stand the new street would only be 13ft. 3in. in width, instead of 26ft. 6in., as provided by the by-laws of the council. At a trial at the Leeds Assizes, Mr. Justice Kennedy granted the injunction, and assessed the nominal damages at 40s. Mr. Scott Fox, who now appealed, said that the question before the Court was one of the construction of the by-laws. The plaintiff had built in Yeaton certain property, called Carlton-terrace. It consisted of a row of nine houses, the fronts of which opened on to a narrow pathway, but the backs of which opened on to a road which gave the only access to carts. It was at the back of one of these houses on which the stable and coach-house were built. He desired to contend that that roadway was a new street and thereby came under the by-laws. The width of their streets should be 26ft. 6in., but the plaintiff had narrowed their street to 13ft. 3in. He desired the Court to say that this was a street within the meaning of the by-laws before a brick had been laid down of the coachhouse. The Court, without calling on the other side, dismissed the appeal.

**PAVING APPORTIONMENT CHARGES.**—MAYOR AND CORPORATION OF WEST HARTLEPOOL v. ROBINSON. —Mr. Justice Stirling has given judgment in this case. It was an application by which the Corporation of West Hartlepool sought to establish and enforce against certain lands belonging to the defendant and abutting on two streets, known as Murray-street and Sandringham-road, two charges for sums of £27 16s. 6d. and £328 3s. 4d. in respect of paving and sewerage of the two streets. The charges were claimed under the provisions of the West Hartlepool Extension Act, 1870. In 1878 the defendant was the owner of the land in question, forming part of the Lynfield Estate, which was then and down to quite recently occupied by him for residential purposes. The owners of the immediately adjoining land on the south were Messrs. Callender, Pape, and Wright, who in 1878 were desirous of developing their property for building purposes, and applied to the West Hartlepool Improvement Commissioners (the predecessors in title of the plaintiffs) to sanction a scheme for that purpose. A plan was submitted by them showing a proposed road 36ft. wide, half on the land of the applicants and half on that of the defendant. The commissioners ultimately sanctioned the proposed scheme, and a road was made, called the Sandringham-road, but in the first instance only 18ft. wide, there being an agreement between the defendant and the commissioners that he would thereafter contribute a sufficient quantity of land on the north to give a street 36ft. wide. In January, 1892, the corporation made an order for the paving and sewerage of the roads in question, being 18ft. wide, notice of which was served on the defendant and the other owners. None of the owners executed any part of the works, and the corporation proceeded to do them themselves. The cost of the works was apportioned by the borough surveyor, the above-mentioned amounts being charged against the defendant, and, on his refusing to pay, the present summons was taken out. The defendant had afterwards thrown the agreed portion of his land into the road, making it 36ft. wide, and had done the necessary work of paving and sewerage that portion of the road, the claim now made against him being for the apportioned cost of making the 18ft. of road which was not upon his land at all. Various defences were raised on his behalf, the most material of them being the contention that the order of the corporation was inoperative as against him, because he had no means of obeying it without committing a trespass by going upon land which did not belong to him. All the questions raised turned upon the construction of the local improvement Act, which, however, was substantially in the same terms as the Public Health Act, 1875. Mr. Justice Stirling, in giving judgment for the plaintiffs upon all the points, with reference to the above-mentioned question said that section 80 of the Act, which imposed the liability upon the owners, did not say anything as to the land on which the works were to be executed. The Act did not say that the work must be executed on land belonging to the owners of "the buildings and lands in the street." It was true that as a general rule the owners of land abutting on a street were owners of the soil, but the rule was subject to many exceptions of which the Legislature must be taken to have been aware and for which it had not thought fit to provide. The Act of Parliament had imposed on persons whose lands abutted on a street certain duties for the discharge of which it was necessary that they should enter on the street, and those duties were

imposed irrespective of the circumstance whether those persons were or were not the owners of the soil of the street. Acts done in due discharge of those duties could not constitute a trespass.

**YET ANOTHER "DRAIN OR SEWER" CASE.**—**HOLLAND v. LAZARUS.**—In this action, which was heard by Mr. Justice Bruce, in Queen's Bench Division last week, the plaintiff carried on the business of a lodging-house keeper at 18a, Dysseystreet, Dalston-lane, and the defendant is the owner of Nos. 20, 22, 24, and 26, Dysseystreet, adjoining the plaintiff's premises. The plaintiff claimed damages for a nuisance created by sewage matter percolating through the soil into his premises and an injunction. The claim for an injunction was subsequently withdrawn and also a counter-claim by the defendant. A drain from the defendant's four houses, constructed in 1884, ran under the plaintiff's lodging-house. It was alleged that, owing to the defective construction of this drain, the lodging-house was, in the earlier months of 1896, rendered partly uninhabitable by the percolation of sewage and noxious gases, and that this resulted in a loss of lodgers to the plaintiff. The defence was that the nuisance was caused by the plaintiff, or his predecessor in title, having a 3in. rainpipe improperly connected with the drain by means of a 6in. pipe. Evidence was given that there was absolutely no fastening in the connections, and that the smells and leakage resulted, at any rate, in great part, from this fact, though it was alleged that leakages had occurred from other portions of the defendant's pipe. Mr. Robinson, for the defendant, submitted that the plaintiff, or his predecessor, by connecting his rainpipe with the defendant's drains had turned it into a sewer, under section 250 of 18, 19 Vic., c. 120, and that it was therefore repairable by the vestry. He quoted "Kershaw v. Taylor" (1895) and "The Queen v. the Vestry of St. Matthew, Bethnal-green" (1896). Mr. Macaskie, in reply, contended that the pipe in question was a drain within the definition of section 250 of 18, 19 Vic., c. 120, being a "drain for draining" a group or block of houses by a combined operation under the order of a "vestry or district board." His Lordship was at first inclined to hold that the pipe was a "drain," but subsequently held that, though it had been a "drain" for the defendant's four houses, the junction of the rainpipe in the plaintiff's house had made it a sewer. He cited "The Queen v. the Vestry of St. Matthew, Bethnal-green," as an authority for his decision. He also held that the plaintiff could not recover for nuisance on the ground that whatever nuisance there was arose from the imperfect joining of the plaintiff's own pipe on his own premises. But he held that a certain amount of leakage from the defendant's pipe, as it passed under the plaintiff's house, had been proved, and that, on the authority of "Humphries v. Cousins" (2 C.P., 239), the defendant was technically liable for a trespass. Mr. Robinson submitted that, the leakage being from a sewer which was repairable by the vestry, the defendant could not be liable for the escape of his sewage from that sewer; but his Lordship gave judgment for the plaintiff with one farthing damages for the trespass, but directed that he should pay all costs save such as should appear to the Taxing Master attributable to the trespass, and he gave the plaintiff costs on the counter-claim.

**LANDLORD'S OBLIGATIONS.**—**BRETT v. ROGERS.**—Mr. Justice Bruce recently gave judgment on this appeal, made upon behalf of the defendant, Miss Rogers, from a judgment of his Honour Judge Bacon, sitting at the Bloomsbury County Court. By lease, dated the 24th of April, 1896, the plaintiff demised to the defendant a house, 53, York-terrace, Regent's Park, and the defendant covenanted with the plaintiff that she would at all times during the term "pay the land-tax, sewers rate, and all other taxes, rates, duties, assessments, impositions, Parliamentary, parochial, or otherwise, which now are or shall at any time during this demise be assessed or imposed on or in respect of the said demised premises or of the rent hereby reserved (landlord's property tax only excepted)." On June 5, 1896, the vestry of St. Marylebone served a notice upon the plaintiff under the Public Health (London) Act, 1891, requiring him to abate a nuisance arising from the state of the drains of the house, 53, York-terrace. He was required to take up the defective drain and lay a proper drain throughout the premises. The plaintiff did the work, incurring an expense of £43 18s. He brought an action in the County Court against the defendant to recover this sum, and recovered judgment. Mr. Justice Bruce, in delivering the judgment of the Court, upheld the decision of the County Court Judge. He said that the obligation imposed on the landlord to take up the defective drain and lay a new one was a duty imposed on him in respect of the demised premises, and so was within the meaning of the covenant. The case was not distinguishable from the cases of "Payne v. Burridge" and "Sweet v. Seager," in both of which the expenses of drainage were held to come under the word "duties" in covenants similar to the one in question. In "Thompson v. Lapworth" the words

of the covenant were "all taxes, rates, duties, and assessments which, during the continuance of the demise, should be taxed, assessed, or imposed on the landlord or the tenant of the premises in respect thereof." The words "imposed on the landlord or the tenant" did not add to the scope of the covenant so as to make that case distinguishable from the present where the words of the covenant were "imposed in respect of the premises." Having discussed the cases of "Tidswell v. Whitworth," "Rawlings v. Briggs," "Budd v. Marshall," "Allene v. Dickinson," "Wilkin v. Collyer," and "Aldridge v. Ferne," his Lordship said that they would be going contrary to the current of the decisions if they were to hold that the words in the covenant, "duties imposed in respect of the premises," were not wide enough in scope to entitle the plaintiff to recover.

**A STRAND ARBITRATION.**—Mr. Under-Sheriff Burchell and a special jury, sitting at the Hotel Cecil last week, had before them the arbitration case of the United Realisation Company v. the trustees of the late Arthur Jones. It was a case in which damages had to be assessed in respect of the compulsory acquirement of the freehold of Nos. 80 and 81, Strand, for the purpose of widening the approaches to the Hotel Cecil and the Strand Improvement Scheme. Sir W. Marriott, for the claimants, said the Hotel Cecil formed one of the schemes projected by Jabez Balfour in connection with the Liberator group. Since the hotel had been taken over and opened up, the question of the widening of the approach was brought home to the minds of those interested, and steps were soon taken to acquire the premises in question for the purpose of widening the approach. Upon the property was a lease, of which 56½ years had to run. Under the conditions of the will of the late Mr. Jones, the trustees were not empowered to sell the property under other than compulsory orders, and to that end an Act of Parliament had been passed, principally for the purpose of the widening of the Strand, whereby the Realisation Company could compulsorily acquire the property in question. Whatever damages were assessed, the money would have to be invested in Consols, and the only question before the Jury was what amount, under the circumstances, should be awarded the claimants. As he had said, 56½ years of the lease remained, and the premises were let at a rental of £400 per annum. Then there was the reversionary interest to take into consideration, which would bring the total amount up to about £20,000. Evidence was then given on behalf of the claimant by Sir J. Whittaker Ellis, who estimated the compensation, with the allowances for compulsory sale and interest on the reversion, at £19,021. Mr. H. A. Jones and Mr. Boxall gave evidence, the former as to the area of the property in question, and the latter to the particulars of the lease. For the Realisation Company, Mr. Freeman contended that the claim was excessive, and called Mr. Robert Vigers and Mr. Douglas Young, who estimated the amount to be awarded at £11,220 and £11,165 respectively. The jury assessed the amount at £16,500, including 10 per cent. for forced sale; and the Under Sheriff gave judgment accordingly, with costs.

**ARBITRATION AT LEIGH, LANCES.**—Mr. W. Ambrose, Q.C., M.P., the arbitrator appointed by the Local Government Board to hear the differences between the claimants and the Leigh Urban District Council in regard to the amount of compensation to be paid in the disputed cases in the Leigh improvement scheme under the Housing of the Working Classes Act, concluded the hearing of the cases on Friday at the Leigh Technical School. Several cases were settled, and agreements came to. Mr. J. Riley, butcher, the lessee of the shop 10, Market-street, claimed £1,793, but agreed to take £375 and the costs; Mr. G. Ritson, butcher, lessee of the shop 44, Bradshawgate, Leigh, claimed £1,020, but agreed to take £340 and costs; Mr. A. Calland, the owner of the freehold in the shops 10 and 12, Market-street, claimed £5,500, but agreed to take £2,156. Awards will have to be made by the arbitrator in the cases reserved for consideration.

The principal builders in Trowbridge have formed a Master Builders' Association on the lines laid down by similar societies elsewhere. It will embrace the towns and district around.

Mr. Frederick Dellow, the owner of a number of houses in East Greenwich, was summoned to the local police-court on Monday for permitting seven houses to be in a state injurious to health. The magistrate, who had visited the houses in question, said they were in a disgraceful state, so that he felt it would be better that the unfortunate tenants should be evicted than permit them to remain while the repairs, which would be necessarily considerable, were carried out. He ordered the premises to be closed at once, and wished some compensation could be allowed to the persons who would be evicted. The defendant was fined £3 in each of seven cases.



## Our Office Table.

DURING the past week four additions have been made to the collections in the National Gallery, all works by modern artists, none of whom were previously represented on the walls. The most important, as well as the most popular, is the brilliant example of Sir John Millais's brush, "A Yeoman of the Guard," which, when hung at the Royal Academy in 1876, was pronounced the picture of the year. It has been bequeathed by Mrs. Hodgkinson, and was hung on Monday on a screen in Room XX. A very different class of work is "Christ and the Women of Samaria," by the late George Richmond, R.A.; it is dated 1828, showing that it was painted when the artist was but 18, and has been hung in Room XXI., where it is No. 1492. It has been presented by the painter's family. The competitive design for the National Gallery made by the late Professor E. M. Barry, R.A., has been presented by his brother, Mr. J. Wolfe Barry, C.B., and is hung at the western end of the entrance hall. A fourth work is the gift of a body of subscribers, and is the landscape by Professor Giovanni Costa, exhibited at the New Gallery, and entitled "A View of the Carrara Mountains." This is hung in Room XXI.

A GENERAL assembly of the Royal Scottish Academy was held on Thursday in last week, Sir George Reid, president, in the chair—to elect a member in room of the late Mr. J. Donovan Adam and two honorary members. Mr. P. W. Adam was elected a full member, Mr. G. Ogilvy Reid coming second in the voting. The two honorary members elected were Sir E. J. Poynter, president of the Royal Academy, and R. Rowand Anderson, LL.D., architect. Dr. Rowand Anderson was at one time an associate of the Royal Scottish Academy, but resigned his connection with it in 1883. His election now as an honorary member is a recognition of the admirable work he has done in the interval as an architect, and as honorary director of the Edinburgh School of Applied Art. Mr. Adam, the new academician, is a son of the late Mr. Patrick Adam, of Edinburgh, Writer to the Signet. He began exhibiting pictures in the R.S.A. exhibitions about 1872 or 1873, among his early works, which were favourably received, being "Alice in Wonderland" (1882), which is now on loan in the Dundee permanent gallery; "Ave Maria," of the same year, which was his first introduction to the Royal Academy; and "The Sisters," also shown in the early "eighties." He was elected an associate of the Scottish Academy in 1883. In 1887 he was in Italy, and painted a number of Venetian scenes, which were exhibited at various galleries. One of these, "The Ducal Palace," was bought and presented to the Aberdeen Art Gallery. During the past few years Mr. Adam, while still painting figure subjects, has given some attention to landscape, his handling of which has been a good deal influenced by the freer methods of the Glasgow school. Two figure subjects, however, of his, "In the Studio" and "Christmas Cards," have been purchased out of the Scottish Academy's exhibitions for a gallery in Auckland, New Zealand. This year he exhibits a figure called "Morning" and three landscapes.

The special committee of the London County Council which is inquiring into the management of the Works Department sat again on Friday. Further evidence was given by Mr. H. R. Taylor, an alderman of the Council. Mr. John Burns, M.P., said he was in favour of the retention of the labour clause in the Council's contracts. He was satisfied that the average quality of the work done by the Works Department, shilling for shilling paid, was better than that of the average contractor. The conditions of labour under the Council predisposed the men not to scamp their work. He did not agree that the Works Committee was more suited to do engineering than architectural work. He had never recommended anybody for employment on the Council's works. He believed two or three members of the Works Committee had thrown every obstacle in the way of the committee's doing its work properly, and that the ratepayers had suffered in consequence. The committee adjourned till Wednesday, when a Mr. W. B. Fullwood, who was formerly employed by the department as an inspector of gasfittings, said he drew attention to fictitious entries in books and other irregularities as far back as the last

recess of 1894. He admitted having written that a councillor had borrowed money from an official, but declined at present to give their names. Mr. A. R. Binnie, the council's engineer, said it was impossible to build up a great department of the sort in a day. It had taken three generations to build up the Pearsons' firm, and about the same in the case of the Mowlems'. He was of opinion that in the short time it had been in existence the department had done wonders, and very few even of the big firms could have stood such an examination in public. The committee adjourned till to-day (Friday).

Mr. E. R. ROBSON, F.S.A., F.R.I.B.A., the architect to the Education Department, suggests, in a letter to the *Times*, that the London County Council might, perhaps, before coming to a decision as to the future of the Works Department, draw a clear distinction as to the methods most suitable for new works and for repairs, for large works and for small, for those involving capital expenditure, and those paid for out of current account. Mr. Robson says he had twice held important public appointments involving the control of a body of workmen for repairs and maintenance. In both instances new works of any size were invariably let by contract. The only case within his knowledge where an opposite course has been pursued was that of the Mersey Docks and Harbour Board, who carried out a long, continuous series of large works in the stupendous extension of the dock system at Liverpool with their own workmen and under their able engineer, Mr. George Fosbery Lyster. The only point on which the Council might appear to be able to excel as their own builders is that of paying cash for everything. But the large contractors all do the same. In new or large works they can, Mr. Robson thinks, no more compete with the contractor than the architect with the speculative builder.

The Institute of Mechanical Engineers will hold its summer meeting this year in Birmingham, and as it is the jubilee of the institute a special interest attaches to the occasion. The institute had its origin in Birmingham, its first meeting having been held in that city in 1847, when the office of president was held by the famous railway engineer, Mr. George Stephenson. For a long time its headquarters were at Birmingham; but a few years ago the institute offices were removed to London, and the ordinary meetings are held there, though a summer meeting is always held in one of the leading provincial towns. The meeting will begin on Tuesday, the 27th of July, and will last over Friday, the 30th. On the morning of the 27th, at ten o'clock, the Lord Mayor will receive the members at Mason College, and will give them a hearty welcome on behalf of the town. The programme will include the reading of papers, visits to important works, various festivities, and some excursions to places of interest in the neighbourhood.

The first annual dinner of the London and Provincial Builders' Foremen's Association was held at the Holborn Restaurant on Saturday evening. Mr. B. G. Thompson, of Messrs. Nightingale and Co., Albert Embankment, occupied the chair, and there was a large attendance of members and guests. In replying to the toast of the evening, "Success to the Association," which was proposed in hearty terms by the chairman, the president, Mr. G. Barclay, mentioned that the movement was commenced three years ago, and had made steady and regular progress, the list of membership now numbering over 70 names. Among other aims, the association sought to raise the status of the builders' foreman, and to recommend to the masters men of proved character and ability. With this view the committee ensured that none were enrolled in membership except those who had good records for past work. The association also served as a social bond, giving foremen opportunity for mutual intercourse and interchange of ideas. Other toasts were "The Building and Kindred Trades," given from the chair; "The Chairmen," proposed by Mr. Chinery, vice-president; and "The Press," proposed by Mr. Arthur Warren, secretary, and acknowledged by the representative of this journal. In addition to the usual songs, the evening's entertainment was agreeably varied by a conjuring performance, given by Mr. H. G. Clarence.

On Saturday Professor G. Baldwin Brown, of Edinburgh University, lectured in Moffat to a large company on Mediæval and Modern Sculpture. Mediæval sculpture was partly Christian

and partly antique, and about the 13th century they found it was largely used in connection with architecture. In the French Gothic school it was found to be employed in the portico of churches, where, although it had not the technical correctness of the Greek and Italian sculptors, it was carried out in a manner truthful, simple, and fresh, and always in connection with the decoration of the building. The Early English work of the same period had similar attributes. The Italian work in sculpture had benefited by their training in beauty and effect. Their reliefs in bronze of religious subjects were of a strongly pictorial character, showing a very special turn in the direction of painting. They crowded in many figures, and the result was florid, theatrical, without concentration. During the last century there had been a revival of the Classic style. Now, however, the feeling was becoming more Italian, and Greek was less looked upon. The influence of painting was now strong on sculpture, just as it was in the old days in Italy. Modern sculpture lacked the beauty and grandeur of Greek sculpture. The sculptor of to-day did not work so much for the type, and that was the reason that modern sculptors were less successful in the Monumental style than in works of the Domestic style.

ACCORDING to *Fire and Water*, a colossal reservoir is to be constructed, enough to supply the City of Boston for three and a half years, and of a capacity twice as great as that of the new Croton reservoir of New York, and three times that of the six reservoirs of Birmingham. It will hold more water than the inner harbour of Boston. The dam is to be built at Clinton, Mass., and the vast area of water, over 4,000 acres, will be retained by a bank 1,250ft. long, 127ft. high above the ground, and 158ft. high above its rock foundation; these dimensions do not equal the Croton dam, which has a height of 225ft. above rock. The engineers have taken every precaution to sustain the pressure of this enormous collection of water. The dam will cross a narrow gorge above Lancaster Mills, at which point rock support exists. It will be built wholly of masonry, and to the same cross-section as that of the Croton dam. The town of Clinton regards the scheme as a source of danger, as, should the dam give way, it and other towns would be washed away, and miles of territory would be submerged. But as the pressure exerted by water penned up is as the depth, and not the area, no greater danger exists than in many others.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts. "The Industrial Uses of Cellulose," Cantor Lecture No. 2, by C. F. Cross, F.C.S. 8 p.m.

Surveyors' Institution. Discussion on Allotments and Small Holdings; paper by C. H. Hooper on "Fruit-Growing as an Auxiliary to Agriculture." 8 p.m.

TUESDAY.—Society of Architects. Annual Dinner at the Hotel Cecil, Strand, W.C. 6.30 p.m. for 7 p.m.

Auctioneers' Institute. "The Law of Fixtures in Practice," by John Hepper, J.P., F.S.I. 8 p.m.

Institution of Civil Engineers. "The Main Drainage of London," by J. E. Worth and W. Santo Crimp; and "The Purification of the Thames," by W. J. Dibdin. 8 p.m.

WEDNESDAY.—Society of Arts. "Reproduction of Colour by Photographic Methods," by Sir H. Trueman Wood. 8 p.m.

York Architectural Society. "History and Development of York Minster," by Rev. Canon Argles.

Surveyors' Institution. Annual Dinner at the Hotel Cecil.

THURSDAY.—Society of Architects. Discussions on "The Arguments for and against the Registration of Architects"; and "The Advantages and Disadvantages to Country Architects of belonging to a London Society." St. James's Hall, Piccadilly. 8 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

The FOURTH ORDINARY MEETING of the Society of Architects for the Session 1896-97, will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on THURSDAY, FEBRUARY 25th, 1897, at Eight p.m. A DISCUSSION will take place on the following Questions:—

1. THE ARGUMENTS FOR AND AGAINST THE REGISTRATION OF ARCHITECTS.  
2. THE ADVANTAGES AND DISADVANTAGES TO COUNTRY ARCHITECTS OF BELONGING TO A LONDON SOCIETY.  
At this meeting smoking will be permitted.

ELLIS MARSHALL, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.



## LIST OF COMPETITIONS OPEN.

London—Convalescent Fever Hospital .....	£150, £100, £50 .....	T. D. Mann, Clerk to Met. Asy. Board, Norfolk-st., Strand, W.C....	Feb. 22
Felixstowe—Laying-out Cliffs and Erecting Buildings .....	£50, £15 .....	Jennings and Haward, Felixstowe .....	Mar. 1
Enniskillen—Town Hall (£7,500 limit) .....	£50, £20, £10 .....	Thomas Elliott, Borough Surveyor, Enniskillen .....	" 20
Christiania—Railway Terminal Station Plans .....	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s. .....	Railway Offices, 6, Victoria-terrace, Christiania .....	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Wash- ington Browne, A.R.S.A., Edinburgh, Assessor) .....	£100 (merged in 4 per cent.), £50, £25 .....	A. Macdonald, Town Clerk, Hillock House, Govan .....	" 31
Sheffield—Westbar Fire & Police Station (local Architects only) .....	Four premiums of £15 .....	H. Bramley, Town Clerk, Sheffield .....	" 31
Guernsey—States Assembly Hall (£15,000 limit) .....	£100, £50, .....	N. Domaille, Supervisor of Harbour, States Offices, Guernsey .....	April 17
Halifax—Police Station and Court House (no Assessor) .....	£50, £25 .....	Keighley Walton, Town Clerk, Halifax .....	" 30
Elne, France—Water Supply Scheme (3,300 inhabitants) .....	£150, in three premiums .....	La Marie, Elne, Pyrénées Orientales .....	July 1
London—Electric Omnibus and Cab Designs .....	£50, £20 .....	Sec., London Electric Omnibus Co., 6, Northumberland-av., W.C....	"
Bolton—Fire Station (£12,000 limit, local architects only) .....	30gs. .....	R. Gudgeon Hinnell, Town Clerk, Bolton .....	"
Nuneaton—Conservative Club (£3,000 limit) .....	50gs. (merged in 5 p.c.), 20gs., 10gs. .....	J. H. Bland, Solicitor, Nuneaton .....	"
Wandsworth Workhouse Infirmary—Nurses' Home .....		A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth .....	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

North Petherton—Cottages .....	Duke of Bedford .....	The Steward, the Bedford Office, Tavistock .....	Feb. 20
Maxworthy—Two Cottages .....	Duke of Bedford .....	The Steward, the Bedford Office, Tavistock .....	" 20
Hellescott—Cottage .....	Duke of Bedford .....	The Steward, the Bedford Office, Tavistock .....	" 20
Cockermouth—Lodge and Museum, FitzPark .....	Committee .....	Thos. Bakewell, Secretary, Cockermouth .....	" 20
Cannes—Post and Telegraph Office .....	French Government .....	The Mairie, Cannes, Alpes Maritimes .....	" 20
Windsor—Additions to Albert Institute .....	Building Committee .....	Secretary, Albert Institute, Windsor .....	" 20
Bradford—House Wood Royd Estate .....		S. Robinson, Architect, Cheapside, Bradford .....	" 20
Dufftown, N.B.—Distillery Warehouse .....		C. C. Doig, Architect, Elgin .....	" 20
Brynsiencyn—Schools and House .....	Llanidan School Board .....	Richard Davies, Architect, Bangor .....	" 20
Rishton—St. Charles's Presbytery .....		Jas. T. Landless, Architect, Nelson, Lancs. .....	" 20
Limerick—Additions to Convent .....	Society, Marie Reparatrice .....	W. E. Corbett, M.R.I.A.I., 28, Glentworth-street, Limerick .....	" 20
Kendal—Extensions, Netherfield Works .....		Robert Walker, F.R.I.B.A., Windermere .....	" 20
Brentwood—Improvements to Congregational Chapel .....		Chas. Pertwee, F.R.I.B.A., Bank Chambers, Chelmsford .....	" 20
Bath—Shop and Stores, Piccadilly .....	E. B. Basson .....	H. Hookway, Solicitor, 15, Old Bond-street, Bath .....	" 20
Oswestry—Woodcutting Shed .....	Board of Guardians .....	J. C. Bull, Clerk, Oswestry, Salop .....	" 20
Wibsey—Four Houses and Stores .....	Industrial Co-operative Society .....	J. T. Barlinson, Architect, 5, South Bank, Wibsey .....	" 20
Bristol—School, Fairfield-road .....	School Board .....	W. L. Bernard, F.R.I.B.A., 3, St. Stephen's Chambers, Bristol .....	" 22
Langthorpe—Four Cottages .....	Parish Council .....	Seth Shaw, Clerk, Langthorpe, Boroughbridge .....	" 22
Falmouth—Church Restoration .....	Committee .....	Edmund Sedding, Architect, Plymouth .....	" 22
Manchester—Alterations, Leaf-street Baths .....	Corporation .....	The City Surveyor, Town Hall, Manchester .....	" 22
Middlesbrough—Lodge to Cemetery .....	Committee .....	F. Baker, Borough Engineer, Middlesbrough .....	" 22
Brigham—Brick Building at Broughton Hall .....		T. Penrice, Crosby, Cumberland .....	" 22
Staining, Poulton-le-Fylde—Stables .....		The Secretary, Queen's Brewery, Staining .....	" 22
Bradford—Clothing Establishment, Kirkgate .....	School Board .....	Milnes and France, Architects, Bradford .....	" 23
Walthamstow—Schools, Wood-street .....		T. W. Liddiard, High-street, Walthamstow .....	" 23
Omagh—Villa .....	Rainbow Dyeworks Co. .....	Thos. McCarron, George's-street, Omagh, Ireland .....	" 23
Kendal—Rebuilding Old Brewery .....	Rev. Canon Austen .....	John Stalker, M.S.A., Kendal .....	" 23
Boscombe—New Premises .....	Board of Guardians .....	Jennings and Goater, Architects, G.P.O. Chambers, Bournemouth .....	" 23
Whitby—Parish Room, Brunswick-street .....	Corporation .....	E. H. Smales, A.R.I.B.A., 5, Flowergate, Whitby .....	" 23
Athy, Ireland—Dispensary House at Castledermot .....	Salisbury Rural District Council .....	T. P. Orford, Clerk, Workhouse, Athy .....	" 24
St. Helen's, Lancs—Sanatorium .....	Wm. Scott, Cardiff .....	G. J. C. Broome, Borough Engineer, St. Helen's .....	" 24
Britford—Shed near Workhouse .....	Corporation .....	F. Holding, Clerk, Market House Chambers, Salisbury .....	" 24
Cadoxton—Two Houses and Shops, Cardiff-road .....	Pioneers' Industrial Society .....	Gethin and Wallis, Architects, Windsor Chambers, Cardiff .....	" 24
Cardiff—Setting-back Wall, &c., of Workhouse, Cowbridge-road .....		J. L. Wheatley, Town Clerk, Cardiff .....	" 24
Rotherham—Public Swimming-Bath .....		H. H. Hickmott, Town Clerk, Rotherham .....	" 24
Dewsbury—Hoist and Covered Way .....	Urban District Council .....	Holton and Fox, Architects, Westgate, Dewsbury .....	" 24
Clevedon, Somerset—Alterations to Severn Cliff House .....		S. J. Wilde, Architect, Boulevard Chambers, Weston-super-Mare .....	" 24
Barnet—Fire-Engine House and Cottage, Tapster-street .....		The Surveyor, 40, High-street, Barnet .....	" 24
Skinningrove—Prim. Methodist Classrooms .....		Rev. F. Watson, 9, Westfield-terrace, Loftus .....	" 24
Shielbridge, N.B.—Stables, Cottages, and Laundry .....		A. Maitland and Sons, Architects, Tain, N.B. .....	" 25
Oxenhope—House .....	Mrs. Amies .....	Judson and Moore, Architects, York Chambers, Keighley .....	" 25
Peterborough—House in Thorpe-road .....	School Board .....	Jas Ruddle, Architect, Boroughbury, Peterborough .....	" 25
Wimbledon—Three Classrooms, Haydon's-road Schools .....	Committee .....	H. G. Quartermain, M.S.A., Kingston-road, Merton, S.W. .....	" 25
Belfast—Presbyterian Schools, Glandore-avenue .....	Board of Guardians .....	N. Fitzsimmons, Architect, 82, Royal-avenue, Belfast .....	" 25
Antrim—Alterations to Workhouse .....	Harbour Trustees .....	J. Clark, Clerk to the Board, Antrim .....	" 25
Dundee—Shed on Western Wharf (300ft. by 120ft.) .....	Proprietors, Marble Works .....	G. L. Buchanan, Harbour Engineer, Dundee .....	" 25
Bradford—Show-rooms and Offices, Otley-road .....	Derbyshire County Council .....	Empsall and Clarkson, Architects, 7, Exchange, Bradford .....	" 25
Mickleover—Enlargement of Lunatic Asylum .....	Joint Hospital Committee .....	B. Scott Currey, St. Michael's-churchyard, Derby .....	" 26
Mogden, Middlesex—Fever Hospital .....	Urban District Council .....	W. J. Ancell, Architect, 3, Staple Inn, Holborn .....	" 26
Walthamstow—Boiler House, Low Hall Sewage Works .....		E. J. Gowen, Clerk, Town Hall, Walthamstow .....	" 26
Hanwell—Villas, Shakespeare-road, Drayton Park .....		C. A. Fisher, Surveyor, 16, Finsbury-circus, E.C. .....	" 26
Lancaster—Story House, Royal Asylum .....		W. J. Ashworth, 41, Market-place, Lancaster .....	" 26
Drayton Park, Hanwell, W.—Three, Six, or Twelve Pairs Semi- Detached Villas .....			
East-the-Water, Bideford—Four Houses .....		W. A. Fisher, Surveyor, 16, Finsbury-circus, E.C. .....	" 26
Rishworth—Engine-House and Shed .....		— Clements, 74, High-street, Bideford .....	" 26
Purdyburn, Belfast—Gate Lodge at Asylum .....	Ryburn Mill Co. .....	R. Horsfall, Architect, 15, George-street, Halifax .....	" 27
Brynmawr—New Church .....	Commissioners of Control .....	G. E. Shanahan, Assistant Secretary, Board of Control, Dublin .....	" 27
Bradford—Nurses' Home, Infirmary .....	Vicar .....	Nicholson and Hartree, Architects, Hereford .....	" 27
Folkestone—Mortuary at Cemetery .....	Board of Management .....	Milnes and France, Architects, Bradford .....	" 27
Faughan—Renovation, Presbyterian Church .....	Burial Board .....	H. B. Bradley, Clerk, 52, Sandgate-road, Folkestone .....	" 27
Sheffield—Retort House, Coal Stores, &c. .....	Gaslight Co. .....	Wm. Barker, Architect, 25, Orchard-street, Londonderry .....	" 27
Rochdale—Three Houses, Albert Roysd-street .....	United Gaslight Company .....	Hanbury Thomas, Secretary, Commercial-street, Sheffield .....	" 27
Sheffield—Retort House and Coal Stores .....	Corporation .....	Bamford and Brocklebank, Surveyors, 59A, Yorkshire-st., Rochdale .....	" 27
Andover—Alterations to Town Hall .....	Harbour Commissioners .....	Hanbury Thomas, Manager, Commercial-street, Sheffield .....	" 27
Kingswear, Dartmouth—Alterations to Lighthouse .....	Committee .....	T. E. Longman, Town Clerk, Andover .....	" 27
Newport, Mon.—Eisteddfod Pavilion in Cattle Market .....		E. H. Back, M.S.A., Dartmouth .....	" 27
Gateshead—Houses and Shops, High-street .....	A. Cameron .....	T. Ll. Evans, Hon. Sec., 3, Commercial-street, Newport, Mon. ....	Mar. 1
Glasgow—Killing-rooms and Piggeries, Moore-street .....	Corporation .....	J. G. Crowe, Architect, 50, Grainger-street, Newcastle-on-Tyne .....	" 1
Culmington—Church Tower Restoration .....	Committee .....	J. D. Marwick, Town Clerk, City Chambers, Glasgow .....	" 1
Hereford—St. Peter's Parish Hall .....		Rev. D. E. Holland, Culmington Rectory, Salop .....	" 1
Londonderry—Additions, County-Court House .....		Nicholson and Hartree, Architects, Hereford .....	" 1
Clontarf—Station .....	Great Northern (Ireland) Railway .....	A. C. Adair, Architect, Londonderry .....	" 1
Ternscobee, Armagh—Gatekeeper's Cottage .....	Great Northern (Ireland) Railway .....	T. Morrison, Secretary, Amiens-street Terminus, Dublin .....	" 1
Castlederg—Schoolhouse .....		T. Morrison, Secretary, Amiens-street Terminus, Dublin .....	" 1
Canterbury—Beane Institute and Library .....	Corporation .....	Rev. Jas. Connolly, P.P., Urney, Strabane .....	" 1
Horton, Surrey—Foundations of County Lunatic Asylum .....	London County Council .....	H. Fielding, Town Clerk, 15, Burgate-street, Canterbury .....	" 1
Morley—Mill .....	A. Glover .....	R. W. Partridge, Clerk, 21, Whitehall-place, S.W. ....	" 1
St. Bee's—Alterations, Main-street, Schools .....	School Board .....	T. A. Buttery, Architect, Queen-street, Morley .....	" 1
Rotherham—Four Almshouses .....	Bellamy's Trustees .....	F. W. Jackson, Clerk, 10, John-street, Worthington .....	" 1
Brislington, Bristol—Passenger Station .....	Great Western Railway Company .....	J. E. Knight, Moorgate-street, Rotherham .....	" 2
Tottenham—Fire Station, Minister-road .....	Urban District Council .....	G. K. Mills, Secretary, Paddington Station, W. ....	" 2
Keighley—Pavilion to Fever Hospital .....	Joint Hospital Board .....	Edward Crowne, Clerk, Tottenham .....	" 2
Southend Pier—Winter Garden .....	Corporation .....	Judson and Moore, York Chambers, Keighley .....	" 3
Abbey, Tuam—Dispensary .....	Tuam Board of Guardians .....	W. Gregson, Town Clerk, Southend-on-Sea .....	" 3
Mullingar—Dispensary .....	Board of Guardians .....	The Clerk, Tuam .....	" 3
Gigha, N.B.—School .....	Corporation .....	Jas. Kenny, Hon. Secretary, the Dispensary, Loughnavalley .....	" 5
Coventry—City Hospital Extension .....	Joint Hospital Board .....	Hugh Douglas, Gigha, Argyshire .....	" 6
Burnley—Fever Hospital, Kebble Bank .....	Cricklade Rural District Council .....	G. and I. Smeane, Architects, Little Park-street, Coventry .....	" 6
Lydiard Millicent—Isolation Hospital, Parbon Stone-lane .....	North Riding County Council .....	W. T. Fullalove, Clerk, Town Hall, Burnley .....	" 6
Yarm—Police Constable's House .....	Mrs. Box .....	R. J. Bestwick, M.S.A., Fleet-street, Swindon .....	" 6
Saltaash—14 Terrace Houses .....		Walker Stead, County Surveyor, Northallerton .....	" 6
Colchester—House .....	Board of Guardians .....	Mrs. Box, Beech-grove, St. Austell .....	" 8
Gosport—Alterations, Workhouse .....	Essex County Council .....	Wm. C. Street, Architect, 7, Victoria-street, Westminster .....	" 8
Chelmsford—Laboratory in Duke-street .....	Committee and Vicar .....	H. A. F. Smith, Architect, High-street, Gosport .....	" 10
St. Blazey—Church Roofs Restoration .....	Diocesan Building Committee .....	J. H. Nicholson, Secretary, County Offices, Chelmsford .....	" 11
Londonderry—New Bishop's Palace .....		E. Sedding, Architect, 12, Athenaeum-street, Plymouth .....	" 13
		S. F. Close, Architect, 53, Waring-street, Belfast .....	" 15



## BUILDINGS—continued.

Ipswich—Alterations and Additions to Offices, Tower-lane	School Board	J. Shewell Corder, Architect, Wimbourne House, Ipswich	—
Leeds—Building Hoffman Kiln		F. Rhodes, Upper Wortley, Leeds	—
Harrogate—Altering Old Post-Office into Bank	York Banking Company	T. E. Marshall, Architect, Princes-street, Harrogate	—
Harrogate—Swimming Bath, Mornington-crescent		H. E. and B. Bown, Architects, Harrogate	—
Cramond Brig, N.B.—Brick Building near Station		— Aitken, Clubmaker, Cramond Brig	—
Cockermouth—Alterations to Shop and Cottages, St. Helen's-st.		John Fleming, Market-place, Cockermouth	—
Sheffield—Seven Houses, Whitehouse-road		W. J. Taylor, Architect, 38, Bank-street, Sheffield	—
Sheffield—Additions to Stores, Wincobank	Brightside Co-operative Society	Henry Webster, Architect, 86, Queen-street, Sheffield	—
Longford—Wing to County Infirmary	Governors	County Surveyor, Longford, Ireland	—
Farnham—Three Pairs Semi-detached Cottages		Nash and Son, Architects, Farnham	—
Kilnfield—32 Houses, Park-road	Old Mill Co.	Sidney Scott, Architect, York Chambers, Oldham	—
Colchester—Semi-detached Villas, Creffield-road		J. W. Start, Architect, Colchester	—
Tudhoe-Grange—Six Houses, Durham-road		Post Office, Tudhoe Colliery, Spennymoor	—
Clayton—Semi-Detached Villas, Chrishabon Park		H. and E. Marten, 5, Charles-street, Bradford	—
Cardiff—House and Stables, Fairwater		E. T. Jones, Architect, St. Mary-street, Cardiff	—
Bradford—Six Houses		West Bros., 11, Saplin-street, Whitley-lane, Bradford	—
Alphington—Church Tower Restoration		Jas. Jerman, F.R.I.B.A., 5, Bedford-circus, Exeter	—
Chorlton-on-Medlock—Bakery, Mornington-street		W. F. Mason and Co., Engineers, Longsight, Manchester	—
Leeds—Additions to Premises, Sheepscar		J. A. Mosley, 6, Wormald-row, Leeds	—
Harrogate—Lion Villa, West Park	Geo. Goodrich	A. C. Gibson, Architect, Yorkshire Bank Chambers, Harrogate	—
Buxton—House	Frederick Smallman	W. Sugden and Son, Architects, Leek	—
Enniskerry—Repairs to Powerscourt Rectory	The Rector	Cecil Orr, A.R.I.B.A., Enniskerry	—
Droylsden—Alterations, Castle Schools		J. H. Burton, Architect, 2, Guide-lane, Hooley Hill, Droylsden	—
Danby End, Yorks—Wesleyan Chapel		J. W. Taylor, Architect, Newcastle-on-Tyne	—
Blackburn—St. Ann's Schools, France-street		Gerald Hill, Architect, Albert-square, Manchester	—
Alfreton—Clothier's Premises in High-street	B. B. Gilbert	The Proprietor, High-street, Alfreton	—
Shoeburyness—Eagle Club House	Trustees	Eagle Club, Cambridge Estate, Shoeburyness	—
Rochdale—Additions to Property, Toad-lane		T. Townsend, jun., Architect, Fleece-street, Rochdale	—
Peterborough—Five Houses, Padholme-road	T. H. Watson	M. Hall, Architect, Huntley Grove, Peterborough	—
Kingston-on-Thames—Workhouse Infirmary	Board of Guardians	Jas. Edgell, Clerk, Portsmouth-road, Kingston-on-Thames	—
Southend-on-Sea, Essex—Superstructure of Hotel Victoria		James, Thompson, and Greenhalgh, Architects, Southend-on-Sea	—
Streatham Hill—Completing Six Houses		F. H. Harvey, F.S.I., Architect, 183, Lavender-hill, S.W.	—

## ENGINEERING.

Isle of Harris—Two Piers	Inverness County Council	G. Woulfe Brennan, C.E., Oban	Feb. 20
Belgrade—Refrigerating Machinery, Hydraulic Lifts, & Engines	Cattle Market Co.	The Secretary to the Company, Belgrade, Roumania	" 20
Plumstead—Heating Wesleyan Chapel	Trustees	H. J. Falding, Secretary, 15, Genesta-road, Plumstead	" 22
Warkworth—Scouring Apparatus in Butts Reservoir	Alnwick Rural District Council	H. W. Walton, Clerk, Alnwick	" 22
Blackburn—Storm Overflow Conduit	Corporation	Wm. Stubbs, Borough Engineer, Blackburn	" 22
Dublin—Steel Footbridge, Amiens-street Terminus	Great Northern Railway, Ireland	T. Morrison, Secretary, Amiens-street, Dublin	" 22
Newry Station—Steel Footbridge	Great Northern Railway, Ireland	T. Morrison, Secretary, Amiens-street, Dublin	" 22
Dewsbury—Enlargement of Retort House, Gasworks	Corporation	C. T. Lee, Town Clerk, Dewsbury	" 22
St. Pancras—Two Lancashire Boilers	Vestry	G. H. F. Barrett, Vestry Clerk, Pancras-road, N.W.	" 23
Kidderminster—Steel Girder Bridges over Canal and Stour	Corporation	A. Comber, Borough Surveyor, Kidderminster	" 23
Liverpool—Boiler, Smithdown-road Workhouse	Toxteth Park Guardians	J. Moulding, Clerk, 15, High Park-street, Liverpool	" 24
Charonne, Paris—Pumps, Engines, and Boilers	Gas Company	Hotel de Ville, Paris	" 24
Hyde—Gas-Holder	Woolwich Board of Guardians	Wm. Smith, Manager, Gas Offices, Hyde	" 24
Plumstead—Alterations, Boiler House and Boilers	Spanish Government	J. O. Cook, 1, Eleanor-road, Woolwich	" 24
Porto Rico—Four Light Railways		Spanish Consulate General, 23, Billiter-street, E.C.	" 25
Kennet, Allos, N.B.—Water Supply to Kennet House (4,400 yards run)	Lord Balfour of Burleigh	Robt. Forbes, Estate Office, Kennet	" 25
Bideford—Stone Culvert (300yds)	Corporation	C. W. Hole, Town Clerk, Bideford	" 27
Hamburg—Pumping Machinery	City Authorities	The Secretary, Rathaus, 1 Stock, Zimmer 34, Hamburg	" 27
Sheffield—Tank, &c., Grimesthorpe Gasworks	United Gaslight Co.	Hanbury Thomas, Manager, Commercial-street, Sheffield	" 27
Ipswich—Pumping-Engine and Steel Boiler	Waterworks Committee, Corporation	Hamlet Roberts, Waterworks Manager, Ipswich	Mar. 1
Cologne—Heating Apparatus at Dock Building	Dock Board	Engineer, Room 18, Old Post Office, Cologne	" 1
Northleach—Tank and Water Mains	Rural District Council	S. Ward, Clerk, Northleach, Glos.	" 1
Savernake to Sturt—Widening Line (1½ miles)	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 2
Sturt to Westbury—New Railway (13½ miles)	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 2
Uffington—Station Improvements	Great Western Railway Company	G. K. Mills, Secretary, Paddington Station, W.	" 2
Sutton-under-Whitestonecliff—Stone Bridge	North Riding County Council	Walker Stead, County Surveyor, Northallerton	" 6
Nunnington—Widening Stone Bridge	North Riding County Council	Walker Stead, County Surveyor, Northallerton	" 6
Borgo and Mozzano Railway	Official	Italian Ministry of Public Works, Rome	" 15
Huelva—Dredging the Padre Santo Channel	Spanish Government	Public Works Department, Madrid	" 20
Ostend—Harbour Extension	Provincial Administrator	17, Rue des Augustins, Brussels	April 13
Brazil, St. Paulo—Lighting City by Gas	Municipality	Department of Agriculture, S. Paulo, Brazil	" 30
King's Bromley—Well-sinking at Creamery		F. C. Edwards, Grafton-yard, Hampstead-road, N.W.	—
London, E.C.—Erection of Scotch Crane (80ft. high)		— Williams, Builder, Bermondsey-street, S.E.	—

## FENCING AND WALLS.

Cuddington, Banstead—Fever Hospital Site	Joint Hospital Board	H. D. Searles-Wood, F.R.I.B.A., 157, Wool Exch., Coleman-st., E.C.	Feb. 20
Birkenhead—Concrete Wall, Ichester Wharf	Corporation	A. Gill, Town Clerk, Birkenhead	" 20
Glasgow—All Larch and Wire Fencing (for One Year)	Glasgow and South-Western Ry.	F. H. Gillies, Secretary, St. Enoch Station, Glasgow	" 22
Port, Stranorlar—Retaining Wall (100yds., 8ft. high) along shore	Donegal Railway Company	R. H. Livesey, Secretary, Stranorlar	" 25
Redditch—Inclosing Show-yard with Hoarding (3,000ft.) and Shedding	Hereford Agricultural Society	A. Edward, Corn Exchange Offices, Leominster	Mar. 1
Rushden—Wire Fencing (500 yards)		A. Sykes, Architect, 45, Finsbury-pavement, E.C.	—

## FURNITURE.

Waterloo, Liverpool—Shelving, &c., Free Library	Urban District Council	F. S. Yates, A.M.I.C.E., Town Hall, Waterloo	Feb. 24
Stourbridge—Sixty Iron Workhouse Bedsteads	Board of Guardians	Thos. Wall, Clerk, Union Offices, Wordsley, Stourbridge	" 25

## PAINTING.

Knowle, Fareham—Exterior of Hants County Asylum	Asylum Visitors	F. M. Aylen, Clerk, Knowle, Hants	Feb. 22
Sale—Public Library and Art Schools	Technical Institution Committee	A. J. M'Beath, Surveyor, Council Offices, Sale	" 23
Derby—Full-street Baths (Exterior and Interior)	Corporation	R. J. Harrison, Borough Engineer, Derby	" 24
Salford—Ladywell Sanatorium	Corporation	S. Brown, Town Clerk, Salford	" 25
Victoria Park—The Pagoda	London County Council	C. J. Stewart, Clerk, Spring-gardens, S.W.	Mar. 17
Ramsbottom, Lancs—Union Works	Spinning and Manufacturing Co.	J. Moss, Secretary, Union Works, Stubbins, Ramsbottom	—

## PLUMBING.

Bristol—Plumbing at Fairfield-road School	School Board	W. L. Bernard, F.R.I.B.A., 3, St. Stephen's Chambers, Bristol	Feb. 22
Glenies, Fintown, and Cloghan Stations	Donegal Railway Company	R. H. Livesey, Secretary, Stranorlar	" 25
Enniscorthy—Plumbing at Lunatic Asylum	Commissioners of Control	Secretary, Board of Control, Customs House, Dublin	" 27

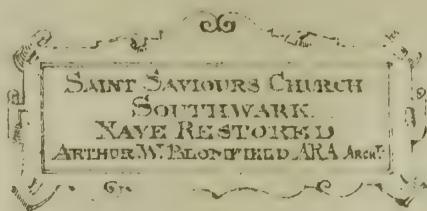
## ROADS AND STREETS.

Batley—Making-up Trinity, Victor, and East Bath Streets	Corporation	J. H. Crack, Town Clerk, Batley	Feb. 20
Fitzton, Barton-on-Irwell—Making-up Prince's-road, &c.	Rural District Council	J. W. Whitworth, Clerk, Union Offices, Patricroft	" 22
Harrogate—Making-up St. Mary's-avenue	Corporation	Sam Stead, Borough Surveyor, Harrogate	" 22
Forest Hill—Making-up Honor Oak Park	Lewisham Board of Works	The Surveyor, Catford, S.E.	" 23
Brockley—Making-up Stonden Park	Lewisham Board of Works	The Surveyor, Catford, S.E.	" 23
Kidderminster—New Road, Park-lane to Back Market-street	Corporation	A. Comber, Borough Surveyor, Kidderminster	" 23
Stockport—Making-up Streets	Corporation	J. Atkinson, St. Peter's Gate, Stockport	" 24
Cardiff—Making-up Eight Streets	Corporation	J. L. Wheatley, Town Clerk, Cardiff	" 24
Cardiff—Paving Main Streets with Australian Hardwood Blocks	Corporation	J. L. Wheatley, Town Clerk, Cardiff	" 24
Friern Barnet—Making-up Roads	Urban District Council	E. Goodship, Clerk, Beaconsfield-road, Friern Barnet	" 24
Great Crosby—Widening of Liverpool-road	Urban District Council	W. Hall, Surveyor, College-road, Great Crosby	" 24
Cleethorpes, Grimsby—New Streets	Urban District Council	Nutley, Mashford, and Wade, Cambridge-street, Cleethorpes	" 24
Ramsgate—Street Works in Perry-road	Corporation	Borough Surveyor, Ramsgate	" 25
Penarth—Street Improvements	Urban District Council	J. W. Martin, Clerk, Penarth	" 27
Hoole—Making-up Philip and Mackerel-streets	Urban District Council	A. E. Caldwell, Clerk, 17, Newgate-street, Chester	" 27
Caversham—Kerbing, &c., Short-street	Urban District Council	R. Simmonds, Clerk, 4, Bridge-street, Caversham	" 27
Bishop Auckland—Paving Two Streets	Urban District Council	J. T. Proud, Clerk, Bishop Auckland	Mar. 1
Middleton—Making-up Booth-street	Corporation	F. Entwistle, Town Clerk, Middleton, Lancs.	" 3
Hove—Road-making in Ranelagh-villas, Shakespeare-street, and Sheridan-road	Urban District Council	H. Endacott, Town Clerk, Hove	" 8
Kingston-on-Thames—Making-up Lowther-road	Corporation	H. A. Winsor, Town Clerk, Clatterton House, Kingston-on-Thames	" 8
Plumstead—Paving, &c., Grove-road and Seven other Streets	Vestry	E. Hughes, Clerk, Vestry Hall, Maxey-road, Plumstead	" 3
Plumstead—Widening and Pitching High-street	Vestry	E. Hughes, Clerk, Vestry Hall, Maxey-road, Plumstead	" 3
Crews—Sewering and Making-up Hungerford-avenue	Town Council	F. Cooke, Town Clerk, Crews	" 5
Kent—Road Maintenance and Repairs (One Year)	County Council	F. W. Ruch, County Surveyor, 86, Week-street, Maidstone	" 9









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FEB. 19, 1897.



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## THE BUILDING NEWS

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FRIDAY, FEBRUARY 26, 1897.

## ADJUNCTS AND ACCESSORIES.

SOMEONE has said "the features make the face," and no one doubts the variety of countenance, of shades of character and subtle differences of expression, which even the size and shape of an eye, or the profile of a nose, or the curl of a lip give to the face. So it is in almost an equal degree with those features of a building which most of all strike us as we look upon it. It is not the *ensemble* of the composition so much as the expression of certain details that is impressed on the mind. External features, like entrances and windows, give at once a character to the design, which even the most casual and superficial spectator must appreciate. The outline of a building, its mass or contour, has, of course, its effect in impressing the beholder. The severity or rigidity of its lines or their playful and diversified character have each their influence; but the smaller features are, after all, the chief elements in the composition and those which attract the attention; and the same importance attaches to the interior. The hall and staircase are the first features that are noticed, and they at once impress us with the dignity and character or otherwise of the architecture. When we enter a room, the ceiling and walls, decoration, and fittings impart to it a feeling of warmth and finish, or of coldness and bareness. The furniture, pictures, and decoration first arrest the eye, just as it involuntarily notices the subject and incidents of a picture before the frame; the walls and ceiling is rather like a frame or background for them. But the room itself gives the key to the whole, for if the furniture is showy and elaborate a mean or bare room makes the contrast disagreeable; the sense of fitness is not maintained as we cast our eyes from the gorgeously-patterned and coloured carpet to the bare walls and ceiling. The eye is pained by a want of proportion between them.

Among features of the exterior the entrance is all important; but what an infinity of character goes with it. It may be too small or too large, too insignificant or too ambitious, too retiring or too obtrusive; and yet these extremes are what we most meet with, and we may consider first the entrance of domestic buildings. The architect introduces this feature after he has arranged his plan and elevations: He has some image in his mind, or, without any particular study, he unconsciously follows a conventional model, as if it did not much matter. It must fit the plan, the proportions of his hall or corridor. It must be squeezed in somehow between two walls—a few inches more or less does not trouble the designer, so long as it can be introduced without altering the plan. Nor does its position matter. Few think of altering the plan to give it more prominence—that would entail too much labour—so long as it is on the right side of the house. The English architect has never been strong at the entrance. The Frenchman, and even the New Yorker, makes it a study; it is made large and dignified even in his domestic work; sometimes, indeed, the most elaborate detail and sculpture is lavished upon it. Tennyson describes the Lombard porches as "Porch-pillars, on the lion resting," an expressive definition of their importance. What trait is this of the Englishman's character that makes him so reticent in the doorway of his mansion? Does it represent the lack of hospitality of his nature, or is it because he prefers retirement? Whichever it is, we rarely see a

decently-sized or well-designed entrance in all the miles of streets and terraces which meet our gaze going from Charing Cross to Hammersmith, nor from the same point to Regent's Park. In Bloomsbury, too, where old and well-built residences abound, the entrances are meagre in the extreme, plain openings in the wall arched with fanlights or square-headed under entablatures or cornices of the most commonplace character. Often the doorway is exceedingly small and narrow, as if it was never intended for two persons to pass one another at the threshold, and certainly was never intended to admit a large sideboard or piano; if wider than usual, it is extremely plain and ugly. The impression such an entrance leaves on the mind is that it is such a bare necessity that the easier it is accomplished the better; there must be an aperture in the wall, and this must be finished off as neatly and inexpensively as possible; if a couple of columns be added outside, forming a porch, it is all that can be expected; then it is considered handsome. But there is no preparation of the wall for all this. The aperture is left with plain jambs, or is moulded; and for all that it is architecturally, it might just as well be filled up with brickwork or masonry. The planned entrance is, in short, not thought of at all in the design. Every architectural feature has sprung, and ought to be derived from a motive. When this is absent, the design is sure to be poor and meaningless. As long as the entrance is regarded as a sort of necessary evil to be ignored as a feature, we may expect to see the wretched narrow ill-shaped and meagre doorways of private houses. In our business premises till lately the doorway as a feature was neglected; we cannot say the new examples have emulated the French or the usual Continental feature. It is often too much of an afterthought, something stuck on afterwards. Even such examples as the entrances to Messrs. Redfern's shop, Conduit-street, or Pagani's Restaurant, Great Portland-street, give an impression of this kind; the latter is an arcade of four deep-soffit arches resting on pilarets carried on pedestals, and forming an open vestibule of terracotta. One of the few attempts we have seen lately to deal with an entrance flat with the wall treated simply is Mr. H. T. Hare's entrance to his County Council Buildings at Stafford (see "B.N.," Jan. 22 of this year), and Messrs. George and Peto have given us a good example of a doorway in Harrington Gardens, in which a carved or relief frieze forms part.

The architects of New York and other great cities of the West have caught the spirit of the French in making the entrance a structural feature of some prominence. In many of the public buildings it is emphasised by a bold circular arch of masonry; they are wide and spacious openings, deeply membered, to which other details are brought into relation. The tall office building has in this respect been treated with becoming dignity. A wide-arched entrance occupies sometimes the entresol as well as the ground story. The Schiller Theatre, Chicago, the American Tract Society's Building, and the American Surety Building, have fine entrances. In the last, a neo-Grec treatment of orders is introduced. Of our modern public buildings there is little to boast of in this respect, and, perhaps, with the single exception of the Natural History Museum, size and dignity are not qualities that are striven after.

Second in importance to the entrance is the window. English architects cannot claim to have invented much in the way of fenestration; we have either borrowed from Italian or French sources, where our own national styles have not been laid under contribution. What is of more consequence is that few architects ever design their windows; they are replicas from an Italian or Renaissance palace or some Gothic

building. A window—proportion, dressings, carving, and all—is taken bodily from one building and put to do duty in another under totally different conditions, without regard to the climate, the atmosphere, duration of meridional sunshine or surrounding buildings. When Barry adopted at the Reform Club House the windows of the Farnese Palace, designed by Michel Angelo, or Sangallo, as some say, he scarcely made enough allowance for the atmosphere of London compared with that of Rome. Again a similar solecism was made by Smirke, when he adopted the fenestration of Sansovino's Library of St. Mark's, at Venice, for his Carlton Club in Pall Mall, a noble building certainly, but quite out of keeping with the sooty atmosphere of London. The band of small windows which Sansovino inserted into the sculptured frieze of his library were sufficient under a Venetian sky; but in the Pall Mall clubhouse the idea of such apertures seems absurd. It is easy to multiply instances of misappropriation where windows of small size and inadequate proportions are introduced to light deep rooms, as if an ordinary oblong-shaped aperture of two squares high in the centre of a long room is sufficient to light it, or a short, low window the right kind of opening for a room of some depth from the front wall! Very few architects have yet considered the principles of rational fenestration as applied to lighting—most of them have gone on repeating types of window from foreign façades because they can think of nothing better. To the ordinary house-owner it matters a great deal more what sort of sash or casement window he is to have. There is still a strong preference amongst people for the common sash-window, as it admits of easy opening without removing tables or window flowers within or without, and is a weather-tight arrangement; but little has been done by the architect to make this useful fitting inoffensive, except to follow Queen Anne or Early Georgian small-paned sashes and thick frames and pulley stiles. We ought not to forget that on the division of the window aperture by bars and lights depends both the external and internal decorative effect. Something has been done towards making our ordinary sash-windows pleasing by subdividing the upper sash by extra bars so as to reduce the panes; but there is still more to be done to redeem the ordinary sash-window from commonplace, and to place this hitherto intractable feature on an equal footing with its more artistic rival, the mullioned casement. He, indeed, would be a benefactor to modern architecture who could show how the advantage of the sliding sash could be combined with the attractiveness of the casement.

In writing on the accessories of our buildings, there is one other feature which seems alike to defy the ingenuity of fire-proof-floor constructor and the resources of the architect. Go into our newly-erected villa, or into any of our public buildings, and we shall find a sense of depression as we cast our eyes on the ceilings of the apartments. They do not escape our gaze; the walls may be hidden by furniture or relieved by wall decoration, but the ceiling is bare and cold. It seems one of those things which the modern architect, with his many resources, has failed to impress with his art. One of many surely; for we cannot even now honestly say that our interior architecture reflects much of the spirit of old work. Our art has not as yet penetrated into the inside of our buildings; it is too much a matter left to the furniture-maker and upholsterer or decorator. We admit there has been much improvement; that our wide and cosy fireplaces, ingle-nooks, quaintly-conceived recesses, furniture, wall-papers, and decorative fibrous plastic ceilings are leading in the right direction, but they have not got much below the surface. The best of plastic ceilings are



lacking in motive. What can be more dishonest than to see the ceiling divided into panels by ribs representing wood?—in fact, beam-work in plaster is wrong, and the only legitimate kind of ornament is surface relief of a shallow kind, like that of the Adam Brothers. The modern ceiling is either preposterously heavy and becoffered, with huge ribs, or it has swags of plaster, as in many of our public halls, or is tawdry and vulgar, with flower centres and cheap plaster panelling, or else “enriched” by some kind of embossed material of an elaborate pattern. The architect has very little to do with it, except to specify something. The highest art of the painter, or sculptor, or modeller is no longer bestowed upon the ceiling as it was formerly. We have not even the Verrios, Andreas, or Thornhills of earlier days, who devoted their art to painted walls and ceilings, as those of Windsor Castle, Hampton Court, and Greenwich Hospital. All these matters are contracted for, and are handed over to plasterers or manufacturers of patented materials. There is another feature about which the architect exercises only a very perfunctory sort of interest—namely, the fireplace. As the central feature of most rooms, it is rather too much of a sort of compromise between the ironmonger and the marble chimneypiece maker. The stereotyped sort of fashionable mantelpiece is made the setting or frame of a modern grate, with tiled hearth and jambs selected by the owner or his wife. Here, at least, we might expect to find a little art; but there is none. How few attempts there are to make the fireplace and “chimney-breast” one; to carry the feature up to the ceiling, and to carve it in stone or model it in terracotta. A few modern instances may be cited where the architect has so treated this feature, as in the Birmingham Law Courts; but in the majority of cases there is the “spick and span” manufacturer’s brand on the work, profuse in its ornamentation, and devoid of any connection with the surrounding walls. As in other instances of usurpation, the over-mantel mania has effectually closed this avenue. People like to buy their own decoration, and so the architect has not been able to do much with this feature of interior design. The manufacturers’ catalogue of ready-made chimneypieces and over-mantels has here again come in to attest the meagreness of the marble mason and ironmongers’ work and the apathy of the profession to render such an interpolation necessary. These are adjuncts to building that the architect ought to make his own quite as much as he does the plan and general design of the building. At one time in the history of the Arts they were regarded as part of the structure itself, and the best art talent was engaged in their execution; but this oneness of aim was lost entirely when accessory features began to be looked upon as subordinate to the architect’s function.

#### BUILDING CONSTRUCTION AND STYLE.

**BOOK-LEARNING** has been somewhat discredited of late among certain members of the profession. According to Mr. A. G. Flower, whose thoughtful paper on “An Unwritten Chapter of Architectural History” we reported a week or two ago, there are certain members of the Architectural Association who not only “object to any form of book-learning, but even declare that all architectural books ought to be burnt,” an opinion that we are sure is not shared by the greater number of members of that learned and studious Association, which has done so much to encourage education by formulating a course of study. There is, at the same time, an idea underlying this rather recklessly asserted opinion, as the lecturer

pointed out. Of course, book study will not make an architect any more than it will make a musician or a painter. Books are useful all the same, though not, perhaps, all those that have been published on architecture or construction. The student must select with caution. Facts and underlying principles accepted by all, he must know, and he must learn them through books, and can do so in no other way. But the art of constructing and designing a building for a given purpose is quite another thing. It is a matter of how to think out a building; to devise a plan to suit the wants of those for whom it is intended, and to put into practice all that he has learned from reading, sketching, and measuring, experience of materials, and modes of construction. No amount of mere reading will give brains to solve a problem, nor can we expect it to do more in arranging a plan. Very useful assistance may be given by a treatise on planning, if any there is, in instructing the student how he should group his apartments, their axial distribution, the proper location of rooms for certain buildings, and so on, but that is all. The faculty of design can only be aided by reading, not made; it is, so to speak, an organised effort of the mind to conceive and dispose. Again, a man may be a consummate draughtsman, yet still be unable to record his observations. Mr. Flower rightly enforced the value of books here. Unaided observation, he said, will not enable a man to read the “riddles of ancient buildings,” or how, when, or why they were built. Like book-learning, aptness in drawing may simply give the student a facility in recording; both are invaluable, but still they do not give the faculty to invent or create. By the first, a man collects and classifies facts and observations; by the second, he can be taught how to record or represent them. Something more is necessary. A concrete example is worth tons of mere theorising in this question. Let us take the design of a building for a warehouse, as the simplest we can imagine. It has to be built of brick and timber, to have three or four floors; and the floors are to be constructed to warehouse a certain amount of goods, and to be strong enough to carry a certain load on each. The ordinary treatise of building construction, divided into chapters treating the various trades, gives only a general description of the different kinds of brick bond, of how the foundations and courses are laid for walls of different thicknesses; how brick angles are formed; piers, arches, and flues constructed, and the materials for mortar and cement. These facts are useful in writing the specification; but they give no clues to the designer of the building as to how he should proceed. He has, for example, to determine the thickness of his walls and piers for certain lengths, and height, and loads to be carried. He may learn a few abstract principles about how much a foot square of brickwork will sustain; but as to how he is to find out what his own wall or piers have to carry is a question to be worked out by himself. For this purpose he must calculate the weight of each floor, and the load it has to carry. But he cannot do this before he knows what depth and thickness his girders must be; what the size of joists to support a certain distributed or central load. Then he must find out how many pillars of wood or iron he has to use (if any), and to determine the size of these. To look up all the necessary facts and formulæ would be to search a small library of books on construction, in very few of which he would find what he wanted, simply because the authors or compilers of such books deal with abstract and disconnected facts instead of with processes. To make such a treatise really practical the author would have to imagine every conceivable building and its requirement—an impossible requirement. We may be told the case we have imagined

does not require all this calculation and labour; that any practical architect can instinctively almost guess thicknesses of walls and floors which will satisfy any requirement without special study or calculation. No doubt; but the practical architect is not the person we are considering, but the novice who is learning his profession intelligently, and who wants to give a reason for everything he does. We are thinking of what the treatise mode of learning architecture involves. But we have said nothing in all this of the early conception of the plan; how the architect has to bring his skill as an artist in arranging the plan and external design, a faculty requiring invention and imagination. The whole process, in fact, is organic. Or take another instance, a piece of construction—a roof or a domical crossing. In such a problem the treatise may help the student as to what is essential, how the roof trusses are to be found, and the members of truss calculated; but it is helpless as an aid to design. The book may perchance give an example of a roof that will suit—a remarkable thing if it does—and the designer is thankful; but should he have another roof to design for a different span, or to cover an area of another form, his book-learning is of no use. It does not teach him how to proceed or to turn his materials to the best account. Like the books on “orders” and styles he learned in his boyhood, such studies are of no account for practical purposes of designing. The same argument may be extended to all other instances of building. Unless we can grasp the circumstances in which a building is erected, we cannot possibly understand why the designer made this or that so, why he gave the form of plan, or roof, or feature. In the study of old buildings we must use our common sense in thus determining the motive of the designer. Our manuals of architecture—those, for example, which describe Gothic buildings—are faulty in not asking the question why their designers gave them the form they assume, or what their constructors aimed at. Instead of which they give us a number of accidental features of no importance to the main question, a description of buttresses, of tracery, of roofs, mouldings, and so on, and by these means classify the buildings into periods or styles. As Mr. Flower observes: “Shoals of books there are, but all of them, down to the very latest, are but echoes of the imperfect description of Gothic architecture, invented by the antiquarian dilettante of a hundred years ago.” Students, in short, will learn little of their art, or understand the problem of design, till they begin to find out the motives that actuated the old builders, and endeavour to apply the same principle in their work. The old treatises on architecture fail because their authors simply gave the external features of the old buildings. Orders and styles, rules of proportion, mouldings, and other details are analysed and described, and are the stock materials with which most of them deal. They have no doubt served a useful purpose in their day. We have to thank our Rickmans, Bloxams, Parkers, and Fergussons for classifying and arranging details; the modern student wants, however, a more solid substratum for his study—not a mere superficial description of features, but the reason why they took the form they did.

#### THE ARCHITECT AND THE PUBLIC.

**AT** the fortnightly meeting of the Architectural Association, held on Friday evening at 9, Conduit-street, W., the President, Mr. BERESFORD PITE, in the chair, Mr. WILLIAM H. BIDLAKE, M.A., A.R.I.B.A., of Birmingham, delivered a lecture on the subject of “The Architect and the Public.” At the outset he pointed out that the public was not inherently or intuitively antagonistic to the architect nor the architect to the public. Some assumed that this state of hostility did exist; but, on the contrary,



each stood for a mutual help to the other. A man must live and be sheltered. This want the architect would satisfy, and would make that shelter beautiful. For all this the building owner would assist in turn towards living and being sheltered. What arrangement could be more just, more harmonious? Quite true, and yet the working of the arrangement might undoubtedly be more just, more harmonious. Then came the question—How? And that was the subject he proposed to discuss. To the architect Society appeared to be divided into two groups—clients and non-clients. The former formed a disproportionately small minority; but the architect could regard any member of the public as a potential client—perhaps he would be wise to do so. Literally, too, every taxpayer and ratepayer was a client where State or municipal buildings were concerned. Of course, he would take an interest in the matter; would see, as far as he could, not only that money was wisely expended in a well-constructed and convenient building, but that its architectural beauty gratified his citizen pride. In securing economy he would undoubtedly do this, beyond that, not the slightest. The unwelcome fact may, Mr. Bidlake continued, be faced at the outset. The British public is profoundly indifferent to architectural matters. From this lethargy one will occasionally awake, and, with a volume of Ruskin in his hand, vehemently denounce the modern architect and all his works. To me it seems immensely to the credit of architects that in the teeth of this public indifference so much good work is done. No wonder Seti or Rameses could count upon the production of a hypostyle hall at Thebes, superbly grand. The services of the architect were then regarded as amongst the highest in the State. Under Pericles every Athenian gloried in each fair jewel of that architectural diadem that crowned the Acropolis. At Florence, in the days of the Renaissance, the same keen interest in architecture invigorated the air her great builders breathed. It braced them to surpass each other, to surpass themselves, to rear works that should be the subject of public praise, even of public gratitude. And of the many great men of that period who practised architecture some have achieved immortal fame. When a people is deeply touched in its heart and emotions, especially when it has been emancipated from some yoke and is intoxicated by the spirit of freedom and hope, then is there an outburst of music and song, and exquisite and grand creations of Art. Such was the case amongst the Athenians after the overthrow of the Persians at Marathon and Salamis, and such, when at the Renaissance, men threw off the superstition and tyranny of the church which had held them in moral and intellectual slavery. A certain degree of wealth ungrudgingly spent is necessary before the enthusiasm of a people can express itself in grand architecture. But easy commercial prosperity makes men content with the uneventful commonplace present; it does not set them longing or idealising. Physical luxury and social position is what they ask, and that they may be left alone to make money. Life runs smoothly, and surface currents do not disturb deeper emotions. The arts, however, minister to the pleasures of life amongst those who are cultivated to feel their influence, and so, even in easy commercial days like these, they may not only flourish, but progress in a steady, quiet fashion, provided that public apathy be replaced by a keen appreciation. For no lovely flower blooms in the garden of neglect. An architecturally appreciative public would stimulate the architect to produce his best. He would produce better work than than he could do in an indifferent world. All his faculties would be awakened. The prospect of public commendation would stimulate him to create something worthy of public praise. But he will need more than that. Public praise is very well, but what if it be the applause of ignorance? Public appreciation, to have any worth and to be capable of influencing the best men, must be critical, and founded on knowledge and good taste. Else will it only be despised. This leads us to consider a second unwelcome fact. The British public is profoundly ignorant in architectural matters. How could it be otherwise? Indifference breeds ignorance, and ignorance indifference. People for the most part do not even know what architecture consists in. Some seem to regard it as the application of archaeology to modern building, a view which has been fostered by architects themselves. There are some clergymen, for instance, who have studied Parker's "A.B.C. of Gothic Architecture," or

have mastered the terms in a glossary, whose lecturing on correctness of style the architect finds much more trying than modest ignorance. And we may, no doubt, recall one or more amateur architects whom a little knowledge has made extremely dogmatic. The popular idea of architecture is that of ornamenting buildings. Here is a barn or factory. Only cover it with sufficient ornament, and it will become architectural. The ornament may be inappropriate and misplaced, it matters not. Before, it was a plain, ugly building; now it is a beautiful one—it is a work of architecture. Such a view might be pardoned in an uneducated man; but it is the view of many an otherwise well-educated man. It is notorious that many people of taste who can appreciate good music, and painting, and literature, fail in understanding the excellences of good architecture. If a building is treated in simple broad masses, it is called plain and ugly—that is, unornamented. The grandeur of breadth and mass is the last thing that the public will admire, unless it be that equally fine quality of reticence. No doubt there is a winning grace in modesty, theoretically; but the Englishman likes to see a man push himself to the front, and he likes to see a self-assertive building, too. He calls it a "handsome structure." This popular architectural taste is especially to be deplored, because it is answerable for the production of an ostentatious class of building which is vulgarising whole districts. And we must suppose that there are architects as insensible as their clients to modesty and refinement in design, or else that they are content to sacrifice whatever principles they may have to captivate the popular taste. Another popular fallacy is that the planning of buildings and the designing of them are two separate processes, and, further, that a building may be designed on paper. So it may be by the experienced man who is reading the perspective value into every part of his drawing. But this paper and T-square designing is one of the chief causes of architectural failure. The right treatment of building material is a matter about which the public has no ideas at all—in fact, does not even know that there may be a right and a wrong way of using material, still less that this is an important factor in judging the excellence of a building. The effect of this widespread ignorance is not only that architects are deprived of the stimulus of cultivated public opinion and approbation, but the public itself is a loser. For not being able to criticise its architects intelligently, and being, perhaps, conscious of the fact, it is at their mercy—and the tender mercies of an architect may be very cruel. Having revived Greek, Mediaeval, Gothic, or some other more or less unsuitable style, the architect will tell his client what is at present the fashion, and what is the proper thing to have, and the client, with British long suffering, will pay heavily for being made miserable and uncomfortable until his lease or his life runs out. But why should this public ignorance of architecture surprise us? From our youth up we have been taught music, and have studied English literature; but no one has instructed us how to read for ourselves the history of our forefathers written in the stones of our village church. Is it not astonishing that the study of English architecture is not part of a school, or at least college curriculum? What better method could there be of teaching a boy to observe accurately, and reason from his facts? Even in the schools of art throughout the kingdom, we may find, perhaps, building construction taught, but the study of architectural history and design is conspicuous by its absence. Can this be remedied? If architects who have presumably studied the subject exerted themselves to further its claims by bringing it before public notice, by assisting in the appointment of architectural professorships and lectureships, and the foundation of architectural scholarships, and by exciting an interest in their own neighbourhood in architecture, much might be done towards securing public recognition of the claims of architectural study. This, of course, would not necessarily mean a purification of architectural taste, but it would assuredly tend in that direction. One of the most important departments of municipal government nowadays is that which deals with the erection of new buildings. Never by any chance is an architect whose experience might be invaluable to his town found to offer his services on its council. No; architects neglect their opportunities of advancing their art and instructing public taste, and stand by and whimper. Indifferent as the average Englishman may seem towards architecture, he is

not so any longer when his interest has been excited. He really wishes to know what is good and what to admire, and if he is authoritatively told to do so he will admire it. But he must be taken in hand first; he will not take the initiative, and it is the architect from whom he has a right to expect this leading. He is for the most part unimaginative and commercial. He worships a fact, especially if that fact is a bargain sealed to his own advantage. So when he builds he likes to see his money's worth. Refinement of proportion is a quality which eludes him. Ornament is tangible. Let him have plenty of it, and full flavoured, and he will be content: he will even praise his architect. But if the beauty of proportion and grouping, breadth of mass, and breadth of light and shade, of reticence, and all those other evidences of refined thought were pointed out to him, he is not so insensible but that he would learn to admire them. But who will point them out to him? Not architects; they are too busy with their private practice. If this be the attitude of the public towards architecture, how does it regard the individual architect? Frankly, it cannot see the reason for his existence. It does not regard him as the practical man—that term refers to the builder. He is a luxury, and an expensive one, and his services may be dispensed with, especially in these days of municipal and rural inspection, when you can rely on "the authority" for seeing that your drains are right and walls dry. People are quite ignorant of the *modus operandi* in designing and erecting a building. They think that when an architect has made a plan and designed an elevation, and obtained a builder's estimate he has practically finished his work. They have no idea of the immense amount of detail work necessary, of the varied knowledge required, of the responsibility, anxiety and labour entailed. It comes as a surprise to most clients who have had no previous experience of building to see the number of drawings required, and to find the architect actually giving his attention to the most minute details. If this knowledge were generally diffused it would save much misunderstanding. As it is, however, 5 per cent. commission is usually considered a high rate, and architects are frequently asked to take less. Not a few do so rather than lose work, even though they are men of established practice, and it becomes a difficult matter to obtain more than 5 per cent., even for the most elaborate church fittings or church decoration. If a building is to be erected for a religious or charitable purpose, the architect is often asked to forgo part of his commission on those grounds, and if he demurs he is reminded that a subscription towards the organ would be very acceptable. It is desirable to have an imposing ceremony of foundation-stone laying, because that stimulates the subscriptions, and the architect is asked to present a silver trowel. Later on, perhaps, he may have to present a silver key for the opening ceremony. As a result, the architect whose practice lies not amongst the commercial, but amongst religious and charitable bodies, is subjected to a perpetual fine, while at the same time the work probably requires a large amount of attention. Not infrequently a committee will act with contemptible shabbiness towards its architect. In fact, a committee may sometimes prove a good instance of individual morality and collective immorality. On a committee there is usually at least one member who has already had some experience of building, and he assists in formulating the requirements of his colleagues, but the private client is often incapable of forming an idea of his own wants, and the architect has to find them out for him. This sometimes entails a number of alternative sketches, and then, perhaps, the client will decide not to build. He is astonished if his architect then sends in his bill. "Why," says he, "I did not approve of any of the sketches you made me." Another method by which a client realises his own wants at the expense of the architect is the private competition. This method is becoming alarmingly prevalent owing to the folly of architects in ministering to it. It appears to me a very mean way of getting £100's worth of brains and paying £10 for it. For undoubtedly the client, if he saw good points in the unsuccessful drawings, would not hesitate to incorporate them in his building. I wonder if painters will in time be asked to compete for painting portraits. Public competitions, on the other hand, provided that a professional assessor is appointed, seem right and desirable. But the offer of a first premium is a delusion and a snare, for it always merges in the commission. The



an architect competes under the tacit understanding that if placed first by the assessor he will be employed to erect the building. It would not pay him to do the immense amount of work necessary in a competition for the paltry and wholly inadequate amount of the first premium. The competition drawings will not serve as the working drawings. All the work must be done over again, and it is right that the architect should receive some compensation for his preliminary labours. There are others, however, to whom these labours have been just as great and who have not the consolation of carrying out the work. Should not these, too, receive compensation for their work in all cases wherein they have been personally invited to compete? And would it not be far more satisfactory to divide the amount offered in premiums, including, of course, the first premium, in equal honorariums to all those who had been invited to compete than the present system of prizes? Further, would it not be to the interest of all to limit the number of competitors in any competition, and so avoid the enormous expenditure of labour and bad language which the Exeter Church competition must have entailed. It is practically impossible for an assessor to select the best out of four hundred drawings, unless one chances to be of conspicuous merit. No competition should have more than twenty competitors, and these should be taken in the order of their application or by some system of ballot. Those of them, however, who had been invited would, of course, receive precedence. In the case of one of the competitors submitting a design of great excellence, but at the same time omitting to fulfil one or other of the conditions, it seems wrong towards the public and posterity that they should be deprived of a great or beautiful building on trivial or ephemeral grounds. The right course seems undoubtedly to erect such a building; but part of the commission payable to its architect might be deducted and paid over as compensation to the first of those competitors who had observed the conditions. In any case the latter should receive a substantial compensation, and any course of procedure which might be adopted by the committee in such a contingency should be clearly made known to the competitors from the first. Now, where the public generally knows little of the extent and character of the architect's work, the attitude of the public towards the architect himself is one of distrust. This is the underlying sentiment, the fundamental note, engendered both by prejudice, hearsay, and experience. We may be inclined to deny this, we certainly should wish to be able to do so. But is it not true? If it is true, what are the causes? There may be many; but there are two chief ones, the distrust of the architect as included in the general distrust of the term "artistic," and the particular distrust of him on financial grounds. As a red rag to the Britisher is the very word "artistic," except as restricted to washed-out colours and painted-drain umbrella stands, to which his wife and daughters, instigated by the various ladies' journals, have accustomed him. To him it means faddism, want of common sense, the sacrifice of comfort to architecture, an unnecessary outlay of money without any compensating gain. It means a complex system of gables and gutters which are always needing repair, sham half-timber work which warps off in the sun, small windows with a transome at the eyeline, leaded glass so arranged that it distorts the outlook, ingle nooks with very uncomfortable straight-backed seats. Now, architects have to blame themselves for this conception of the artistic. The Britisher has shrewd common sense, and his idea of a home is comfort; further, he has an idea that every building should be made as serviceable as possible for its purpose. He does not think it proper to make a building dark in order that its exterior should be in the style of Mediæval Gothic. I am aware of the extreme excellence of much modern domestic work, and how possible these examples prove it to be to combine the greatest comfort with the artistic in its best and highest sense; but we must remember that the public judges from the rank and file of buildings, and the rank and file of architects. Undoubtedly most architects set themselves sincerely to interpret their client's wishes; but there are others—a minority—who seek their own reputation at their client's expense, practically compelling him against his will to accept a certain design or certain features of that design. Now, if a private client consults an architect, and has definite wishes, it is the duty of the architect to respect

those wishes, if he feels they are wise and reasonable. If not, it is equally his duty to persuade his client against them, to, so to speak, save him from himself. This is especially the case in an uneducated man, or one who is possessed of some fad of which he will probably tire. If he cannot persuade his client, then he must carry out his wishes, and make the best of the circumstances, for it seems only reasonable that if a man is going to pay for the work, he should have it to suit him. With public work the case is different. The committee stands for the public, and the individual opinion of any member ought not to override that of the architect, who, presumably, better understands the subject. The architect, it appears, convinced of the rightness of his view, should then maintain his position, not dogmatically defending it so much as winning his opponent to his own side by persuasion. The fact is, both a client and a committee will allow themselves to be persuaded by their architect if they put confidence in him. A further question remains to be considered, one of the greatest importance—the public distrust of the architect on financial grounds. It is often said that if you go to an architect to build you a house you never know where the expense will end. The client lays his wants before his architect, and tells him how much he is prepared to spend. Usually the sum is quite inadequate. Of course, the architect tells him so. Not at all. He tells him that it will need economy, and implies that the design which he submits, and which meets his client's approval, can be carried out for the sum named. All goes well until the builders' tenders are opened, and then comes the disillusionment of the client. The lowest tender is half as much again as the sum to be spent. The architect anticipated as much, but he trusted to his power to surmount the difficulty when the time came. This misleading of a client as to the cost is of most frequent occurrence. How much more confidence a client would have in his architect if the latter told him at once that it would be impossible to erect the building for the sum named. Not at all. He would doubt the architect's judgment, and say that Mr. So-and-So had built a house of similar size for less money, and eventually he would consult another architect, who was willing to mislead him. Every architect knows that if he is thus frank and straightforward with his client he runs the risk of losing him. Notwithstanding this, it is better, even as a matter of policy—and certainly as a matter of professional morality—to let the client know the worst; for you will in time obtain the rare distinction of being regarded as an architect whose estimate can be trusted, and that means in time a practice based on the most solid foundation. A similar difficulty occurs in competitions. A fixed sum is stated, and competitors must design a building which can be carried out for that sum. Each competitor must give an estimate of cost. Some of them conscientiously endeavour to carry out the instructions in the spirit as well as letter. They have to somewhat cripple their design in consequence. Others make elaborate drawings of an equally elaborate building, and give every accommodation that could be desired. They arrive at the probable cost by dividing the sum allowed by the cubical contents of their building, and then, having found a constant—4½d. a foot, perhaps—they multiply this by the cubical contents, and find, to their satisfaction, that it works out at exactly the sum they have to spend. This operation, if judiciously described in the report, is sufficient to throw the committee off its guard, and has even misled the professional assessor. In due time the builders' tenders are opened, and then comes this disillusionment of the committee, and the suppressed growls of the fellow competitors. But if the public distrust the architect on account of the unreliability of his first estimate, how much is that distrust deepened when the bill of extras is presented? Here, again, the architect has himself to blame. He cannot, perhaps, prevent extras altogether, but he can do much to spare his client from the extreme annoyance of an unexpectedly heavy bill. The two most fertile sources of extras are the absence of a thorough thinking and working out of the scheme before the quantities are taken out, and the subsequent alterations made by the client himself. Every building ought to be worked out in half-inch detail, and an exact specification written by the architect himself, and not by the quantity surveyor, and then, and not before, the quantities should be taken out. And if a client is inclined to order extras he should be kept informed by the

architect of how the bill is mounting up, and he will not then be taken by surprise at the total. All this takes much trouble, and a client in his hurry to commence work grudges the time spent in making details. Besides, the work may fall through, and then a large proportion of the work will have been done in vain, although the architect will certainly be entitled to claim payment for it. Notwithstanding these drawbacks, the reputation of being able to build without extras is so unique and priceless to the architect that it is worth some trouble to win. It will increase his practice more than any misleading shifts, or engaging to do work for less than 5 per cent. There remains but one more subject for consideration. The public has heard from time to time some talk of illicit commissions associated with the practice of architecture. There have even lately been discussions on the subject in the Press. There may, of course, be no truth in it, but the public is naturally suspicious. Now, while it cannot be doubted that the majority of architects, as upright and honourable men, would not stoop to receive indirect commissions, yet it is an equally undoubted fact that there are some who do. It is useless to disguise the fact, as it is too well known. The opportunity of increasing his income by the acceptance of those commissions is no temptation to the well-established architect. But all architects are not well established; some have a struggle to make a living, and others are just starting in practice and have not thoroughly grasped the moral question involved. Very severe blame, therefore, rests with those manufacturers and others who offer these temptations, and it is the duty of every honourable architect to endeavour to attach a public stigma to the name of any such firm. In fact, a black-list ought to be kept by each local association, and the members of that association should undertake to boycott all manufacturers and tradesmen whose names appear on such a list. But it is not from tradesmen only that architects sometimes receive indirect payments. It is a practice far too prevalent for architects to share in the quantity surveyor's fees. It is not, indeed, to the credit of either architects or surveyors that the practice should exist at all. The architect employs a surveyor to take out quantities, and for this the surveyor charges certain fees, of which he pays the architect a certain proportion. What for? If the architect has properly worked out his plans and written his specification, both of which are supposed to be included in his own fees, it gives him no extra trouble to employ a quantity surveyor. The payment is as much an illicit commission as if it were paid by a tradesman, although a specious defence is sometimes advanced by those who receive it on the score of custom. It is not that the surveyor is paid less for his work; the extra charge comes indirectly out of the client's pocket. It is the architect, as the client's agent, and not the client himself, who employs the surveyor, and the latter is, therefore, largely dependent on the architect for his work. The same may be said of the builder, as it is usually the architect who invites him to tender. The client, meantime, who is entirely ignorant of the preliminary methods of procedure in building a house, is often left in the dark by the architect even of the very existence of the quantity surveyor, and as the latter is paid, not by the client, but by the builder, there is no very evident way by which a client should get to know of his existence, or that he had been indirectly paying him through the builder. Now, while I would most carefully guard myself from implying the slightest motive of dishonourable practice in thus keeping the client ignorant, I do say that the present system of an architect, practically on his own initiative employing a surveyor, and the latter receiving payment directly from the builder, so that the amount of that payment is hidden in the builder's charges, is one which might readily lend itself to the practice of dishonesty and fraud. I do not say that the fraud exists, but that when the means for it exist without likelihood of discovery, there is a probability that someone will sooner or later be found to avail himself of them. The wise architect will explain everything to his client in the fullest detail at the very first. He will explain the functions of the surveyor, and mention the name of the one whom he proposes to ask. He will state his charges. He will also explain that, if the building is not proceeded with, the surveyor will none the less be entitled to his charges in full. And he would also consult his client as to the builders who should be asked to



As an application of the above principles, let us find the resultant or the equilibrant of the forces  $AB, BC, CD, DE$ , Fig. 27 (a), which are supposed to be given as acting on a rigid body and to be in the same plane. Draw the unclosed polygon  $abcde$ , Fig. 27 (b), of the given forces; then  $ae$  represents the resultant, and  $ea$  the equilibrant of the forces, and it remains to find a point in the line of action of the force. From any point,  $o$ , Fig. (b), as pole, draw the vectors  $oa, ob, oc, od, oe$ . In the spaces  $B, C, D$ , Fig. (a),



draw, starting from any point for the first line, the lines P Q (O B), Q R (O C), R S (O D) parallel respectively to *o b*, *o c*, *o d*, Fig. (b); draw P T (O A) parallel to *o a*, and S T (O E) parallel to *o e*; then T, the point of intersection of these, is a point on the line of action of the equilibrant, and, therefore, also of the resultant force. Thus each force is fully determined.

The very important case in which the given forces are all parallel is shown in Figs. 28 (a) and 28 (b). The above description applies equally well to these figures. J. C. PALMER.

## ADAPTABLE SPECIFICATIONS.—XXXII.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued.)

**A** BAD SLATE is usually a slate that does not ring clearly when struck; but the tone that can be produced in this way varies with the size and thickness of the slate. Few slates, for instance, are more durable than small, thick, rough Westmorelands; but their smallness and roughness prevent them from ringing as the thin Bangor or Carnarvon slates will do. Still, they give out a sharp and somewhat metallic tone, whereas a bad slate only produces a dull and muffled sound. Slates of a blackish tint or of a very deep blue-grey are seldom durable, nor are shaly slates, which can easily be split up into layers by the point of a knife. This is how the Stonesfield and Colly Weston brown slates fail, and where they have been laid for a century or more it is easy to peel them away with the fingers. Their cleavage, in fact, follows the "quarry bed," which is seldom the case with the Welsh slates, and thus every winter's frosts tend to cleave them more and more. Slates with a friable margin should be rejected, and likewise those which are extremely brittle. Another good test of a slate is to set it for some hours in a pail of water so as only to wet the lower portion of it. If the moisture spreads on to the dry part the slate is porous and inferior.

It is an article of faith with many builders that "thin slates are the best." Of course they are cheaper to buy, as there is a great saving of carriage on them, and as they soon get broken whenever a workman of any kind has to pass over them, they help to provide employment when work is scarce. From the building owner's point of view, however, these peculiarities scarcely recommend them. A small, tough slate that will bear rough usage is the most satisfactory in the long run. The amount of lap which slates require depends on the pitch of the roof, and on its comparatively exposed or sheltered situation. A smaller lap than 3in. is not advisable; and a lap of 3½in., or even 4in., may be wisely given in windy places near the seaside. As to the best position for the nail-holes, there is some difference of opinion. The common plan is to place them within 1½in. of the upper end of the slate, so that when laid they will be under a lap. It is objected to this, that when the holes are at one end of the slates, in this way, the wind, if it gets under the other end of slates, acts with great leverage, and may break them away at top. To prevent this, some writers recommend the nail-holes to be put much lower down, so as just to clear the upper edge of the slate below. This, however, produces some risk of admitting the rain through the nail-holes. Unless needlessly long slates are used, the danger of breakage from wind is very trifling; and then the old system is clearly the safest. A rather wide slate with a small "gauge" makes the soundest work—say, 16in. or 18in. long, 10in. or 12in. wide. That every slate should have two nails in it is universally admitted, though attempts are sometimes made to lay them with only one. The grain of a slate should run in the direction of its length.

In close mitred hips there may be a difficulty in getting two holes to each slate. There would be no trouble about it if architects would adopt the picturesque fashion which may be seen on old roofs in Devonshire, and use specially wide slates for hips as well as for verges. To adopt this system might disturb the equilibrium of the ordinary slater, by making it necessary for him to think, but could not greatly trouble the workmen who lay Westmorelands, because they are already accustomed to use their heads as well as their hands. Westmoreland slates generally show about 1ft. wide in the bottom course, which is rather too much, and from this they diminish upwards at the rate of about ½in. in each course.

Being rough in texture, the water does not rise between them by capillary attraction, as it does between smooth slates. Westmorelands are mostly greenish, of various shades. Those from Elterwater are of a light neutral green. Buttermere slates vary, even in the same quarry, from light green to dark green and olive green. Kirkby-in-Furness slates, used on the Natural History Museum, differ from the better-known ones of the same district in being blue. The nails for Westmoreland slating need to be stronger than those in use for thinner and lighter slates. According to Mr. Stirling, who has supplied much valuable information on this subject, the 2in. nails for this purpose should be 90 and the 1½in. 100 to the pound. For nearly vertical roofs or spires copper screws should be used, and these generally have to be purpose-made.

Slates are sometimes bedded in lime and hair, a composition which absorbs the damp and retains it, till sooner or later the roof decays. Torching, that is, pointing the underside of every joint with cement, is better; but, of course, it is impracticable where the slates are laid on boarding, and also where they come so near to the back of a ceiling that there is not room for men to work. Where driving rains are very prevalent, two small rolls of oil putty have sometimes been placed on the back of each slate, in the form of a  $\Lambda$ , with the point a little above the nail-holes, and the bottom of the  $\Lambda$  about 2½in. below them. Putty should not, however, be used under that part of the slates which will be visible when the work is complete, because hot sunshine will bring the oil through, and stain them. Mr. Stirling recommends vertical, instead of horizontal battening, in places where there are violent driving rains—the battens, of course, being laid on boarding. The idea is that any water which may be blown in will then run down the battens and get away, instead of remaining on them and dropping into the building. Vertical battening, however, seems to need something like a small internal gutter at the wall-level, to carry off the moisture which may drive in. To leave a space between the wall and the slating, by which it may get away, would doubtless do what is claimed for it in the way of "keeping the roof cool in summer." But in winter it would effect this purpose much too completely, while drifting snow would make its way through the aperture.

Why should slates be specified "uniform in colour" when it is an object to get tiles speckled and otherwise diversified? This familiar clause is, perhaps, a legacy from the time when slate slabs were admired, and when Duchesses, Queens, and Imperials were thought worth paying extra prices for. When a roof is covered with a few large-sized slates, it may doubtless have an odd effect if two or three of them are differently tinted from the rest. But since roof-coverings with a marked "texture" of their own have been sought for—a "texture" which is best obtainable by dividing the covering into many small pieces—much agreeable variety of tone might be had by setting aside the old prescription. Builders, as a rule, would be amazed at the change, artists would find it an improvement, and slaters would have to be watched, or they would surely work up the different tints into "bands" or wearisome mechanical patterns. Yet a slight play of colour over a roof—soft and harmonious—would often be a very pleasant thing. It might not be easy, or even desirable, to produce it by mixing slates from different quarries. These vary in thickness as well as in size, and do not often work well together; but the different shades that occur in the same quarry would generally combine easily in all respects. It would only be necessary to get the quarry-manager to abstain, once in a while, from sorting them out.

There are a few more points to note as to the colours, and the wear, of different kinds of slate. The green ones, known as "Sedan," "Belgian," and "Imperial," contain specks of iron pyrites. These specks become oxidised in time, when exposed to damp, and then they expand and break up the slates. The Whitland Abbey slates, from Pembrokeshire, are of a pleasant green when newly dug; but after a time they turn to a golden tint. Moreover, they are rather loose and "shuffy," and are liable to break across between the nail-holes. Red slates and mottled slates, both very sound and durable, are largely quarried in Wales; the latter are bluish grey, splashed with green. These are supplied in regular sizes; but the Welsh slates, known as "best tons," are laid in wide, but slightly diminishing courses, and are some-

what thicker than the ordinary qualities. They are grey, with a tinge of green. Carnarvon slates have the reputation of being more brittle than those shipped at Bangor, but are hard and sound. Port Madoc slates, quarried round Blaenau Ffestiniog, are, perhaps, the soundest of all; but neither their colour nor their extreme thinness recommend them for architectural work. Delabole slates (from Cornwall) are darkish in tint when new, and somewhat soft; but they harden with exposure, and get lighter in colour.

The slater, on completion, should clean out all gutters, and the specification should be so framed that he will have to make the roofs good, not merely when he gives up the building for occupation, but just before he receives the final payment under the contract. An exception should, of course, be made in the case of any serious injuries to the slating which the architect may certify as having been caused to it after completion by causes against which it was not the slater's duty to provide. Damage by frost is a cause which he ought to provide against; if it occurs, it implies that the slates which failed were unsound or unseasoned. Fracture from trivial shrinkages or settlements in the woodwork, too, implies unskilful workmanship, and shows that the slates were originally strained or even slightly bent. Slate ridges being made in two or more parts, fastened together by screws or cement, are liable to drop to pieces in time. The Delabole and some other varieties of slate will make good and even artistic chimney-pieces, if worked and moulded instead of being "enamelled."

The slate-merchant not having for years past exerted himself much to provide the sort of materials, in texture, colour, and size, which the modern architect would have been glad to obtain from him, has seen a great part of the roofing business pass over to the tiler. He, on the contrary, has used his opportunity, has improved his manufactures both in quality and colour, and consequently has met with a great deal of encouragement. In themselves, tiles are not so good as slates, or, at any rate, as the best slates. They weigh more, absorb more water, are sooner broken, and when not nailed are more easily stripped by wind. On the other hand, their very thickness causes them to keep a building cooler in summer and warmer in winter. The best of them are now almost waterproof; they can be laid to a variety of different gauges, to suit different rakes of roof; they can be had in all sorts of colours; they produce a surface with a pleasant broken "texture" and of diversified tints, while they can, at a little extra expense, be protected against injury by any ordinary storm. These remarks refer to "plain tiles," which are laid on the same principle as slates, so that the covering is nowhere less than two tiles thick. The other kind, often very ingenious and sometimes ornamental, which are laid on the pantile principle, are not equally in favour for buildings of importance. The fact that they form a covering only one tile thick, though it saves weight and helps to economise roof-timber, involves a certain risk of leakage whenever a crack occurs; and another difficulty in using "pantile" tiles is, that when repairs are needed, as they naturally will be sooner or later, the particular kind of tile required may no longer be obtainable. These facts are to be regretted, since some tiles of this type, such as the Italian ones, have architectural merits of their own, but hitherto the pantile in all its varieties has been used but little, except on sheds and agricultural buildings.

The soundness of tiles may be judged of by their inability to absorb water. Soft red tiles will take in a good deal; hard, brindled, and blue tiles very little. The former often get green and moss-covered; the latter alter but slowly in appearance with time. Their weak point is brittleness. Plain tiles are 10½in. by 6½in., and about ½in. thick. They are usually laid either to a 4in., a 3½in., or a 3in. gauge. It is the practice in some places to bed them on hay at times. Hay is, on sanitary grounds, an undesirable substance to use in buildings meant for occupation. Straw is, perhaps, a little better. The merit claimed for it is that it keeps out driving snow. Lime and hair encourage dampness, and should in no case extend more than 2in. or 3in. below the top of the tile. Tiles on a very flat pitch may be wholly bedded in Portland cement; but the very worst form of bedding is to put only a thin strip of cement just under the bottom edge of each tile. For some unaccountable reason, a large roof at Leytonstone was laid in this way, about twenty years ago. Whenever

\* A 1 high's reser red.



it rained, these cement fillets retained the water which came in at the vertical joints between tile and tile, and prevented it from running down the slope, as it would naturally have done. It consequently dropped through into the interior of the building, ruining the plaster ceilings. All sorts of expedients were tried, including paint and waterproof compositions, but nothing availed till the roof was stripped, and laid with new tiles without any bedding at all. All bedding is better avoided, and if driving rain or snow is feared, the safest plan is to lay the tiles to a narrow gauge on close boarding felted over. *Tile verges* may have, as a soffit, a course of flat tiles laid in cement on the top of the brick gable wall, with their edges not lapped, but butting. Of course, these, and all tiles to be cemented, should be first thoroughly soaked in water. Above this soffit of butting tiles will come the ordinary roof tiling, well tilted up to throw the water away from the verges, and formed next the edge of a tile and a tile and a half alternately. It is well to put two copper nails into every tile for about 18in. back from the verge, all the way from the eaves to the ridge, to prevent the wind from making a start in stripping the roof.

#### THE NEW OPERATING THEATRES, ST. GEORGE'S HOSPITAL.

[WITH ILLUSTRATIONS.]

FOR a long time past the necessity for increasing the theatre accommodation has been greatly felt at this hospital. The extent to which surgical operations have increased, the much longer time that they now take owing to the elaboration of detail, and the tendency to avoid as far as possible operations in the wards, all combined to make the pressure on a single operating theatre too great to be endurable. We now illustrate the two new theatres just completed. Of late there has been a marked tendency to attach great importance to the construction of operating theatres generally; and it was felt that if the work were undertaken at all, it ought to be done in a very complete and elaborate manner, with all the most modern improvements in construction and furniture. The main approach from the second-floor corridor is by a teak staircase 4ft. wide. The staircase is sufficiently wide to admit of a bed being carried up or down if the lift should be out of order—a condition of affairs which is not altogether unknown. There is no doubt that the lift will conduce greatly to the safety and comfort of the patients. The difficulties of planning the new rooms so as to obtain the necessary side windows to all rooms and top lights to the new theatre and chloroform rooms were somewhat increased by the decision to retain the existing "sick room" for nurses. The walls and ceilings throughout are entirely lined with glazed tiles, those of the ceilings being separately screwed up, and each tile being made with a lap joint. In the two theatres and the chloroform rooms the lower tiles are of an olive green colour and form a dado about 4ft. high. A skirting of the same coloured tiles about 18in. high is continued round the corridors, in the scullery, and the sterilising-room. The remainder of the tiling of the walls is of a warm cream colour, the ceilings being white. Every angle throughout is rounded so as to facilitate cleaning, and the whole of the theatres might be washed down with a fire hose. The floors throughout are of marble mosaic. The benches for spectators in the large theatre and the single row in the small theatre are constructed of white Sicilian marble polished on the vertical faces. The standards and rails in the large theatre are the same that were formerly in use. In the small theatre the standards and rails are of gun-metal tubing, and are made so as to be easily removable, in order to give access to the warming apparatus. The skylight of the small theatre is constructed entirely of iron and has double glazing, there being a 4in. air-space between the inner and the outer glass. The glass plates are ground so as to diffuse the light as much as possible and to prevent undue glare. The outer lights being hinged can easily be opened from the outside so as to facilitate cleaning. A gallery passes round the outside of the theatre, in order to give access to the skylight and to the side windows. The object of the double thickness of glass and the air-space between is to obviate the variations of cold and heat that would result if there were a single thickness of glass only; in addition, there are double casement windows round the upper part of the theatre,

forming the sight lights, and there is a small casement window over the sponge sinks. In the chloroform rooms the casement windows are made entirely of gun-metal, and a small top light at an angle of 40° provided so as the light can fall directly on the face of the patient. Over the old theatre, which now, we presume, will be called the East theatre, the skylight has been reglazed, the glass being in much larger squares than formerly. The angles of all the ironwork are rounded; the lights open outwards instead of inwards, as was formerly the case, in order to prevent any dirt that might accumulate on the windows externally from falling into the theatre. The light in the east theatre seems now as good as even the most fastidious could desire. The large increase of reflecting surface from the tiles diffuses the light in the most satisfactory manner. The doors of the operating theatres and the chloroform rooms have been made to slide so as to economise space. The doors themselves are constructed of wainscot oak, every corner being rounded. The sliding doors are fitted with gun-metal wheels running on gun-metal slides. The chloroform room connected with the East theatre has the door hung on hinges, so as to allow the full width of the opening to be utilised. The heating apparatus for the West theatre consists of three sets of copper pipe coils, by steam taken direct from the hospital boilers. Each set of coils is placed in a tiled recess, and fitted on turned bearings and built into the wall. This arrangement enables the coils to be swung forward clear of the recess, so that the whole of the space can be readily cleaned. At the bottom of the recess a tiled opening passes right through the outer wall and communicates with the outside. The fronts of the recesses are closed in by steel plate doors, at the top of which are openings that can be closed at will. An extraction shaft is carried up from the highest part of the theatre and discharges at a level above all the surrounding roofs, and in order to increase the extracting power of the shaft a steam-heated coil is fitted into it. It is calculated that by this arrangement the whole of the air in the West theatre can be changed once in every six minutes. The same arrangement obtains in the other rooms, which are all fitted with identical heating and air-purifying apparatus. In the East theatre the old coils have been re-used, and the arrangements generally are a little modified in detail. In each of the theatres are fixed two sponge-sinks, made in one piece of white-enamelled earthenware. The waste-pipes are governed by a full way-cock, which can be shut off and on by a handle, the object of this arrangement being to obviate the use of plugs and chains, which so readily become foul and are so difficult to clean. The basins in the lavatory are fitted with a pedal arrangement, the apparatus itself being underneath the floor. By pressure of the foot the hot and cold water or the waste can be turned on or off. This device prevents any risk of the fittings being soiled by contact with the hands. The lighting is entirely by electricity; the only room in which any gas is laid on being the sterilising room. Here there is a gas-heater fitted to a Schimmelbusch sterilizer. The designs for the theatres are the work of Mr. H. Percy Adams, and the work was carried out under his supervision. The electric lighting is by Messrs. Drake and Gorham. The heating apparatus is by Messrs. Rosser and Russell.

#### BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE 30th annual general meeting of this Institution was held on Tuesday evening last at the offices, 21, New Bridge-street, E.C., the president-elect, Mr. Thomas Hall (Messrs. Hall, Beddall, and Co.), occupying the chair, supported by the retiring president (Mr. B. E. Nightingale), the treasurer (Mr. E. Brooks), and by Messrs. E. C. Roe, C. K. Turpin, H. W. Parker, Octavius Newling, F. S. Oldham, E. B. Gammon, J. C. Amplett, and others. The annual report stated that the income for the past year consisted of £213 3s. in subscriptions, £30 17s. in donations, £140 5s. in dividends, and £1 3s. interest on deposit, making a total of £665 8s. The amount expended was £483 10s. 5d., which included £390 paid in pensions, and £10 in temporary relief. One of the widows (Mrs. Hill) had re-married, thus resigning her pension. An election was held in December, at which James T. Gough, being the only candidate, was elected by show of hands.

The number of pensioners on the books is 20; the total number who have been elected is 43. There are three children in the Orphan Working School per presentation of the Builders' Clerks' Benevolent Institution. The 18th annual dinner was held on Tuesday, March 24, 1896, in the King's Hall, Holborn Restaurant, Mr. B. E. Nightingale in the chair. The sum announced was £315 11s., and the committee, in thanking him (Mr. Nightingale) for his services, wished to express their great appreciation of his kindness in serving the Institution as president, and for all his valuable and successful efforts in promoting its welfare. Mr. Thomas Hall (Messrs. Hall, Beddall, and Co.) had kindly consented to act as Mr. Nightingale's successor in the presidential chair. The committee again expressed their indebtedness to the builders, the architects and surveyors, and the merchants for their continued support, and concluded with the hope to be still favoured with their help in future as they have been hitherto. The president-elect said that, in moving the adoption of the report, he would take the opportunity of expressing the pleasure he had in occupying that chair, and he thanked the Institution for having done him the honour of inviting him to be its president. He was quite ready to begin to work, and to make himself, he hoped, useful to the charity. He also expressed the pleasure he experienced in meeting some of his old friends, and he trusted that, with the committee's help, they should have a prosperous year. He would move "That the report and balance-sheets for the past year be adopted and printed, together with the list of subscribers and rules of the Institution." Mr. Nightingale seconded the resolution, which was put and carried. Mr. E. C. Roe, in proposing a vote of thanks to the outgoing president and other retiring officers, said that all present knew of the great advantage Mr. Nightingale's services had been to the Institution; he had taken much interest in it, and the result was known to all. Referring to the sum of £400 invested lately, it had been asked where the advantage lay in getting so much for a reserve fund; but it behoved them to see that they had income enough to meet the pensions, and a reserve fund, which produced in dividends a manifest portion of the income, was of essential service. Mr. O. Newling, in seconding, endorsed the remarks made by the last speaker. The resolution was put and carried unanimously. Mr. Nightingale, in acknowledging the vote of thanks, observed that he feared a greater value had been put upon his services than he deserved. He had, however, done what he could, and the Institution would always have his best wishes. On the motion of Mr. Oldham, seconded by Mr. Gammon, the officers for the present year were then elected. A cordial vote of thanks (unanimously passed on the motion of Mr. Turpin seconded by Mr. Brooks), was then presented to the chairman, who replied briefly.

#### THE LAW OF FIXTURES.

MR. JOHN HEPPER, of Leeds, read a paper before the Auctioneers' Institute on Tuesday evening at their offices in Chancery-lane, upon "The Law of Fixtures in Practice." He dealt at length and in detail with the subject, and illustrated the law of fixtures, especially in relation to mortgages, by what he had observed in his professional practice, so as to show in what ways judicial decisions had been understood and acted upon in private arrangements between contentious parties. His experience was confined to a limited area, but it happened to be a manufacturing area, including a wide diversity of trades and manufactures. He commenced with motive power, and steam, water, and gas apparatus, about which it might be supposed no dispute could occur. Even in the matter of motive power and steam and water-piping, which, by the Bills of Sale Act and the Conveyancing Act of 1882, were allowed to be part of the freehold, disputes had arisen, and would, no doubt, occur again; but they rarely now had any difficulty in arriving at an amicable settlement, as the principles involved in relation to these were now pretty well understood; but the question of annexation to the fee by attachment to piping was a contentious one. When they came to working machinery and plant, differences continued to arise upon which learned gentlemen, out of court oftener than in court, exercised their power of discernment and niceties of distinction which the latitude of Justice Blackburn's "true rule" allowed. There was a



question of fixtures in private and licensed houses, in warehouses, workshops, and works of which they heard, perhaps, little, but which ought to be guarded against more than it was by solicitors, mortgagees, and incoming tenants. That was the sale by the occupying owner of the freehold, which was mortgaged, to an incoming tenant of fixtures which were part of the realty and belonged to the mortgagee, whose consent to the transfer was too seldom asked. He took it that, if the mortgagor became bankrupt while the tenant was in possession, and the fixtures sold to him were unsevered, the mortgagee would be able to step in and claim all the fixtures to which he had a right before the mortgagor left the premises, and the tenant would thus be a loser by the transaction. A discussion followed, in which Dr. Heber Hart, and Messrs. W. Roland Peck, Johnson, and Harper took part, and Mr. Hepper was thanked for his address.

#### AN OAK CHEST OF THE TIME OF FRANCIS I.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

MISS ELEANOR ROWE, the manageress of the School of Art Wood Carving at South Kensington, has edited a work on French wood-carvings, which has just been completed from the National Museums, and published by Mr. B. T. Batsford, in three useful folios, making a most practical and *recherché* collection of collotyped photographs, illustrating an uncommonly admirable and suggestive series of choice examples for the use of the student, as well as the designer and craftsman.\* Every plate has been taken from the original direct, and all the prints have scales attached, giving the sizes in inches, which is very necessary, not only for the purpose of a copy being made of either of the pieces, but to enable the reader to judge of the size of the original detail. We have already noticed the first part of this publication, and to-day we have taken the occasion to notice the two remaining folios. From the earlier of these our accompanying plate has been chosen in illustration of the carved front of an oak chest, dating from about the period of the English Reformation. Modern civilisation may be dated from the days when Francis I. reigned in France. This remarkable man was distinguished as a patron of the arts, for he made the period of his reign the golden age for art in France. The most celebrated sculptors at that time were Jean Goujon, Germain Pilon, and Nicolas Bachelier de Toulouse. Jean Goujon, at the age of 30, did his fine work at St. Maclou, Rouen, and in 1548 till 1562 he worked at the Louvre. He entirely revolutionised old traditions, and, discarding mythological subjects, modelled his figures in delicate and subtle relief. The characteristics of the style of Francis I. are the introduction of pilasters, ornamented with arabesques and carved capitals. The Gothic influence is still observable in the square blocking out of the leaves, with few lines or veins on the foliations, and there is a "bossiness" to be noted in the grouping and treatment of the carving. The mouldings are simple, and usually not carved. Cartouches and trophies were freely employed. The oak coffer chosen belonged to the middle of the 16th century, and is now located in South Kensington Museum (No. 679—1895). The bolder parts of the design in some instances are broken off. Du Hanon, who executed for Louis XII. the celebrated wooden ceiling for the "Grande Chambre de Parlement," an excellent cabinet-maker of leading repute, is said to have devised the system of planting on extra wood where fuller relief is required. For a roof, where the carvings are out of the way and not subjected to friction, this is legitimate enough; but for furniture it is a mistake, and not calculated to stand the wear and tear of daily use. In this piece the carving is about  $\frac{1}{2}$  in. in relief, and the lion's head, which is stuck on, is about 2 in. in projection. The background is sloped from the margin. The delicate carving on the stiles is  $\frac{1}{4}$  in. in relief, and is quite out of scale with the rest of the design. In this case, and in some others, the sections and details of mouldings are given in the volume, and we have selected this sample to give a fair idea of the plates under notice. All are most skilfully photographed and reproduced. The subjects are varied, and are grouped together conveniently, including panels, balustrades, doors and architraves, chairs and cupboard fronts, cartouches

and corbels. Their enrichments are depicted delicately, and, of course, with unquestionable accuracy. The concluding part of Miss Rowe's assemblage covers the period from James I., 1603, to the end of the 18th century, thus starting with the reign of Louis XIII. down to the Republic in 1793. The samples garnered in the folio before us are largely taken from the Art Corporation Galleries, Glasgow; a few are from Edinburgh Museum of Science and Art; the remainder are from South Kensington. The work is well chosen and capably reproduced. The letterpress accompanying the plates is helpful and well written.

#### THE L.C.C. WORKS DEPARTMENT INQUIRY.

THE special committee of the London County Council, which is inquiring into the management of the Works Department, sat again on Friday. Mr. M. J. Livingstone, the official of the Council who was said to have lent £200 to a member of the Council, attended, and stated that in 1891 he made an investment of £350 in the business of Messrs. Benn Brothers. Of that sum £150 had since been repaid. He and Mr. J. W. Benn were old friends, and neither of them had ever had anything to do with the Works Committee. The chairman, on behalf of the committee, said the witness had given a perfectly simple explanation of a perfectly straightforward transaction. Mr. Thomas Blashill, superintending architect to the Council, recalled, put in a statement dealing with points in the evidence which concerned his department. In this he stated that there was no foundation for the suggestion that the Council had lost 5 per cent. on anything through ill-feeling between his department and the Works Department. The best feeling always existed between the executive officers of the two departments, and disagreement about items made no important difference. When at one time the late manager suspected some little friction, the witness sent a memorandum round to his staff, laying down the principles upon which as brother officers they should conduct their business. With regard to the direct statement that the clerks of works and the whole body of the officials were antagonistic to the Works Department, he thought it right to add that, with respect to the settlement of accounts, the four independent quantity surveyors employed by the Council had all complained to him that they could not satisfy the demands of the Works Department. In every case where the manager had appealed to him he had allowed him for anything that by inadvertence might have been overlooked, and the quantity surveyors had demanded and received extra payment from the Council for the trouble which the department gave them in settling up the accounts. Nothing of the kind had happened with any contractor. Colonel Sexby, the superintendent of the Parks Department, next gave evidence to the effect that it was advantageous to the Council that it should do its work in laying out the parks and open spaces without the aid of a contractor.

The committee adjourned till Wednesday, when Mr. Ward, chairman of the Works Committee, was recalled, and put in a statement replying in detail to the charges preferred against the Progressive members of the Works Committee by Mr. White and other witnesses, and also dealing with the figures of the jobs on which it was alleged that a loss had been incurred by the department. The chairman announced that that closed the evidence, unless some further witnesses were offered, and the Special Committee would proceed to consider its report.

#### THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of this Society held on Monday last at the temporary premises in Savoy-street, W.C., the discussion was resumed on Mr. J. W. Willis Bund's paper on "Allotments and Small Holdings." Mr. Bund read a letter from a landowner in Wales showing the difficulties which, in many cases have to be encountered in carrying out the provisions of the Act.

Mr. Sabin, in resuming the discussion, said that the question of the rent obtainable for allotments must depend very largely on the district in which they were situated. He quoted statistics of some 916 acres, in various parts, let to some 1,600 tenants, in holdings varying from one-eighth of an

acre upwards, producing an average rent of 33s. 6d. per acre, tithe, rates, and cost of collection included, or about 30s. an acre net. The land let to parish councils, of which he had particulars of some 253 acres, averaged somewhat less. The loss from inability to pay the rent had, on a rental of £2,000 a year, amounted only to £10 in three years. The tendency of all allotments was, he found, to increase in size, the oldest being the smallest. Allotment holders differed in different localities, and allowance must be made for this. In the rural districts the farm labourer wanted his allotment for the purpose of growing a little straw and, perhaps, a few vegetables, while near the towns the mechanic sought recreation from his labours in the cultivation of an allotment, of which he made a hobby. The present procedure for the acquisition of land under compulsory powers was, he thought, clumsy, expensive, and dilatory, and he quoted a case where negotiations had been in progress for nearly two years, there being brick earth under the land sought to be acquired, and it being doubtful what were the respective rights of the local authority to compulsorily take the surface, and of the owner to work the minerals.

Mr. H. Herbert Smith, speaking as agent for Lord Lansdowne's estates, and as chairman of the Allotments Committee of the Wilts County Council, which county stood, he believed, first in the number of small holdings in proportion to its area and population, said that, with every facility for acquiring them, there was no great demand for small holdings. There had been an allotment system on the Bowood Estate since 1812, when it was commenced with two fields. There were now about 600 acres so let; but still the rural population was steadily decreasing, and the tendency was always towards the towns. It was not, of course, possible to let allotments which would only be of any use if near a village or town and on good soil at the same rent which would be taken for a large farm comprising good and bad land, some of which was easily accessible and some quite the reverse; and instances which he gave showed that in his district about £2 18s. an acre was the average rent for such holdings. Then, again, the allotment holder took a net acre, free from all deductions for hedges, roads, buildings, watercourses, &c., which were included in the area of a farm. His own experience had been that the Acts had worked, on the whole, very well, and he thought most land-owners would be glad to encourage allotments.

Mr. W. Wright thought the powers and duties of parish and county councils needed revision, and that the class of persons entitled to take allotments should be more clearly defined. He had no experience of the compulsory acquisition of land under the Act, and he thought that no general rule could be laid down as to allotments. The circumstances and requirements of each particular district must be taken into consideration.

Mr. J. Shaw agreed with Mr. Bund that some alteration in the existing acts was not only desirable, but necessary. His experience was that even genuine application for an allotment was easily dealt with by mutual arrangement with landlord and tenant. He knew personally of only one case where, such arrangements being impossible, recourse had been had to the district council, who had taken upon themselves all responsibility for a 14 years' lease. With reference to rents of allotments, some misapprehension appeared to exist. He had to deal with a case in which hill land facing north was let at a certain rent, and the holders of fertile land near a village, and with every advantage, expected to pay only the same rent.

Mr. J. Looker expressed his opinion that the more this subject was studied the greater were the difficulties which became apparent. There arose the question whether the labourer could be brought back to the soil: and the further question, at what price could it be done, and at whose expense? The Acts of 1890 and 1894 gave no indication of an extension to any other class than the "labouring" class, by which, he took it, was intended the class who lived by manual labour alone.

Mr. Willis Bund, in replying to the vote of thanks, expressed himself as in favour of a consolidation of the law, for the manner in which the Act was enforced gave rise to an immense amount of litigation. In the case of a loss on allotments it was not clear on whom the loss should fall, whether on the parish council, or the district, or

\* French Wood-carvings from the National Collections. Edited by ELEANOR ROWE. London: B. T. Batsford, 94, High Holborn, 1896-97.



county council. The whole matter must be either a matter of charity, or one of strict business, and he held that, as trustees of public money, the local authorities were bound to deal with it from the latter point of view. If a man could not make a small holding pay, it was simply cruelty to put him in one.

#### NATIONAL ASSOCIATION OF MASTER PAINTERS.

**T**HE first annual meeting of the North of England Federation of the National Association of Master Painters in England and Wales was held on Friday at the Golden Lion Hotel, King-street, South Shields. Mr. William Allon, President, occupied the chair, and amongst those present were Mr. Thos. Bonnar, Edinburgh; Col. Bennett and Mr. W. B. Laidler (secretary of the Scottish Master Painters' National Association), Glasgow; Mr. W. G. Sutherland (secretary of the National Association of Master Painters in England and Wales), Manchester; Mr. Geo. Spencer, Bradford; Messrs. Geo. H. Park (treasurer), R. G. Salmon (secretary); G. G. Laidler, Newcastle; J. H. Hill, Middlesbrough; W. H. Park, North Shields; A. Holme, South Shields; and G. Kirkup, Sunderland; members of the committee of the North of England Federation; Messrs. G. F. Allan and F. Atkin, Stockton; J. Scott, J. Snaith, and W. J. Taylor, Middlesbrough; J. W. Boanson, Hartlepool; and others.

The President, in his opening remarks, on behalf of the South Shields Association, extended a cordial welcome to the members of the federated associations, and also to those gentlemen who had come from a distance. Mr. R. G. Salmon (secretary), intimated that during the year three associations had been affiliated with them—namely, Sunderland, the Hartlepoons, and Stockton, which had considerably added to their numerical strength. The committee suggested that in future the vice-president should be considered president-elect for the ensuing year, and that the town he represented should be the place of their annual meeting. On this understanding the election of officers was proceeded with.

On the motion of Mr. Scott, Middlesbrough, seconded by Mr. Boanson, Hartlepool, Mr. Wm. Allon, South Shields, was unanimously re-elected president of the North of England Federation for the ensuing year. Mr. Scott, Middlesbrough, was elected vice-president; Mr. G. H. Park, treasurer, and Mr. R. G. Salmon, secretary, were reappointed, and the following were selected as the committee:—Messrs. Geo. G. Laidler, Newcastle; J. H. Hill, Middlesbrough; W. H. Park, North Shields; Thos. Tanes, Blyth; Andrew Holme, South Shields; Geo. Kirkup, Sunderland; G. F. Allan, Stockton; and J. W. Boanson, Hartlepool.

Mr. Boanson proposed a resolution to raise a voluntary fund for the purpose of offering prizes to be competed for by the apprentices in the federation area, the results to be shown at the next annual meeting. Mr. Laidler seconded the motion, which was agreed to.

Mr. J. Corbet McBride, manager of the Globe Accident Insurance Co., Ltd., Manchester, read a paper on the working of the Employers' Liability Act as it affected master painters. Mr. G. H. Park read a paper on "The Difficulties of a Master Painter in Applying his Early Art Training to the Practical Work of a House Decorator."

Mr. Bonnar, Edinburgh, addressed the meeting on "The Institute of British House Painters." He pointed out that the institute was not to be identified with organisations which existed for the protection of what were known as trade interests. Its objects, generally speaking, were to raise the craft of house-painting and decorating to a higher standard as an artistic business; to afford facilities and inducements to everyone engaged in the practice of it to make and maintain themselves thoroughly proficient house painters and decorators, and to grant to those who did so the imprimatur, or, in other words, the "hall mark" of the institute. So far as they had gone in the establishment of the institute, they had been very successful, and they intended to apply for a Royal Charter. He asked for the assistance of all master painters in the matter. Colonel Bennett, Mr. Crawford, and Mr. Laidler having spoken on the same subject, advocating the desirability of having an institute for the purpose of raising the status of their craft, the Chairman moved, "That we, as a federation, give the institute our hearty

support, and that our best thanks be given to Messrs. Bonnar, Bennett, and Crawford for coming to explain the object of the scheme." Mr. Cole, of Newcastle, seconded, and the motion was unanimously adopted. Mr. Sutherland, Manchester, and Mr. Spencer, Bradford, briefly addressed the meeting on the work of the National Association. It was agreed to hold the summer meeting of the Federation at Ripon, and the next annual meeting at Middlesbrough.

#### THE SOCIETY OF ARCHITECTS' DINNER.

**T**HE Annual Dinner of the Society of Architects took place at the Hotel Cecil, Strand, W.C., on Tuesday evening, and proved an interesting, well-attended, and successful gathering. Mr. Robert Walker, J.P., of Cork, the president, occupied the chair, and among the company were the Bishop of Stepney, His Honour Judge Emden, Mr. J. A. Rentoul, LL.D., Q.C., M.P., Mr. G. Candy, Q.C., Mr. S. W. Kershaw, F.S.A., Mr. A. A. Hudson, Professor Banister Fletcher, J.P., D.L., Mr. W. H. C. Payne, L.C.C., Mr. R. Roberts, J.P., L.C.C., Mr. S. W. Thompson, L.C.C., Rev. A. Mercer, Major F. T. Leslie, R.E., and Messrs. G. Highton (past-president), H. Lovegrove and Walter Emden, J.P. (vice-presidents), Ellis Marsland (hon. secretary), Montagu Baldwin, M.A. (secretary), Edgar Farman, G. A. T. Middleton, Silvanus Trevail (of Truro), R. Weller, jun., W. Woodward, W. Williams, O. Marsland, S. Marsland, A. J. M. Drysdale, Hills, Coyle, E. A. Bennett, W. F. Slater, Claude Andrew, J. T. G. West, J. C. Perkin, H. W. Bull, C. E. Jackson, A. R. Finch, R. T. Symond, H. McDermitt, B. R. Tucker, C. Burgess, S. Welman, T. H. Kingerlee, T. C. Richards, G. W. Ferguson, S. T. T. James, J. B. Corby, P. Condy, F. Warren, R. Coventry Dick, W. Elliott, F. W. K. Tarte, A. Scott, R. Johnson, R. M. Chart, J. Hardman, W. Boyer, F. H. Thompson, J. R. Manning, F. B. Hawes, D. Wallace, W. H. Dearle, H. G. Quartermain, A. I. Quartermain, Alderman Skinner, E. Bond, C. Day, J. Williams Dunford, G. Haslam, &c.

The President, having given in eloquent terms "The Queen," Mr. WALTER EMDEN proposed "The Houses of Parliament." This was acknowledged in a humorous speech by Dr. J. A. RENTOUL, M.P., who mentioned that his colleague and fellow Queen's Counsel, Mr. LL. A. Atherley Jones, to whom was entrusted the conduct of the Architects' Registration Bill through the House of Commons, was unavoidably detained by his Parliamentary duties. The President, in proposing the next toast, "The Clergy," observed that to no section of the community were architects so closely allied as with clergymen. The Bishop of Stepney, in responding, alluded to the fact that for some years he had been an honorary associate of the Society. The clergy tried to do their public duty as well as the buildings provided for them by architects would allow them to do so. He often went into churches that were ill-ventilated, and badly planned for seeing and hearing. He had been struck during a recent visit to North Italy by the fact that whereas in this country our designers expended as much as possible on the exteriors of the churches—on towers and spires which did not attract a single person into the building—and starved the interiors, in the portion of Italy he was visiting the very reverse was the case—a miserable unfinished brick building would be filled with the richest mosaics, paintings, and furniture, and was internally a blaze of splendour. He had been invited by the council of the society to read another paper before the members, and he hoped at some future day to take up this subject. Mr. Alfred A. Hudson proposed the next toast, "The London County Council." He remarked that it gave him great pleasure to be in the midst of members of his old profession—architecture. He regarded the County Council as a much-abused body, which had, nevertheless, done good work. One of its good deeds was to replace the antiquated and much-amended Metropolitan Building Act by the London Building Act of 1894, and although this was, he would admit, by no means perfect, and created some hardships, yet it was a vast improvement on the older statute, and when certain defects had been amended it would be a measure of which the architects and builders of London might feel proud. One effect had been to create the Building Act Tribunal, a court of Appeal which had long been called for, and as a

member of that body he believed they were doing good work, while he could absolutely deny that there was any friction between the Tribunal and the Building Act Committee. As to the Works Department, there was a legend current to the effect that a bricklayer, who was in the employ of big firm of builders, found himself overtaken in laying from 450 to 500 bricks a day, and secured employment under the Works Department. There he was reported to have said he had found the haven of rest he needed, for he now laid but 60 bricks daily, and was paid at the old standard rate. (Laughter.) From an architectural point of view, all regretted that the Council had been defeated in the House of Commons in its proposal to provide a new council-hall. The projected building would have been a splendid finish to the south side of Trafalgar-square, and its planning would certainly have exercised the ingenuity of many competing architects. With the toast he coupled the name of Mr. W. H. C. Payne, L.C.C., who, in the course of his reply, said no public body in existence was so absolutely misunderstood as the London County Council. It suffered from prejudice, and he feared that the general opinion was that expressed to him by a lady, who thought the council was created to look after the sewers of London alone, which, she added, was very nice (laughter); but he could assure the company that their duties were of a far more important character. As chairman of the Building Act Committee he would say that, although the present Act was admittedly difficult to construe, it was a great advance on the former one, and there was certainly a good feeling existing between his committee and the members of the architectural profession. He regretted much the defeat of the Bill for providing a council hall; at present these departments were scattered over many private houses, and there was no direct communication, nor even a waiting-room provided. Mr. Candy proposed "Architecture and the Society of Architects," and, with a spark of sly humour, explained that he knew nothing about architecture; but from what he had been told he understood the society supplied what some other architectural bodies lacked—it did its best to promote unity, harmony, and good feeling between members of the profession. The President, in reply, said the society was a progressive one. It sought to elevate the profession in education both scientific and technical, and for that reason had given its support to the examination movement and to the Registration Bill. The object of the society was to raise the standard of architecture and to diminish the numbers of inexperienced, uneducated, and unqualified practitioners. With this view they had allied themselves with the Architects' Registration Bill Committee, which was gaining in public esteem as its objects became better understood, although at present, owing to the block of business in the House of Commons, Parliament had failed to give the attention and consideration to the measure they desired. He wished to correct a prevalent error into which he suspected Mr. Candy's informant had fallen, and to explain that there was no hostility or ill-feeling in the society towards the Royal Institute of British Architects. The toast of "The Arts and Crafts Allied to Architecture" was proposed by Professor Banister Fletcher, who referred to the beneficial work that is being done by the Carpenters' Company and other City Guilds. Mr. M. Thompson, L.C.C., replied, and mentioned that the London County Council had that day voted £150,000 towards the promotion of technical education. Mr. Richard Roberts, L.C.C., also responded. The toast of "The Visitors" was proposed by Mr. H. Lovegrove, and acknowledged by His Honour, Judge Emden. The concluding toast was "The Press," proposed by Mr. Silvanus Trevail, who associated with it the BUILDING NEWS, and alluded to the munificent gifts in aid of technical and art education, and free libraries which had been presented to the people of Cornwall and London by Mr. J. Passmore Edwards, the chief proprietor of that journal. He coupled with the toast the name of Mr. E. W. Harvey Piper, who replied.

On Monday next the building to the west of Exhibition-road, which contains the Indian, Chinese, and Japanese art collections, and the collections of philosophical apparatus, the entrances to which are in Imperial Institute-road, will be open—as is the case with regard to the rest of the Museum—until 10 p.m. on Mondays, Tuesdays, and Saturdays.



## WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XI.

THE remarks to follow will have reference to the relations between the chemical composition and the physical characteristics of steel, briefly touched on in the conclusion of the last article.

Wrought-iron is not made or graded by chemical analysis while it lies in the puddling furnace, but open-hearth steel is. The chemical composition of Bessemer steel is not graded while it is in the converter as is done with the product of the open hearth—the proportions of speigel or ferro added determine that for any given charge; according, however, to variation in the product these proportions are altered from time to time.

It follows, therefore, that the chemist is a very essential official in any steel works; a steel to possess certain physical qualities must have, within very narrow limits, a definite chemical composition. It does not, however, follow that two steels showing identically the same chemical analysis will possess identical physical characteristics. But they may be expected to do so, and, if they do not, the reason must generally be sought either in the conditions attending fusion and manufacture, or in the nature of the subsequent treatment meted out to them, with the latter of which the chemist has nothing to do. Yet, though the chemist and manufacturer work on these lines, steel is not bought and tested by the engineer by chemical analysis, but relatively to its physical characteristics; physical testing alone affords the information needed.

The case of acid and basic steel supplies a confirmation of the fact that results are affected by causes other than percentage composition. Basic open-hearth steel has never been regarded with quite the same confidence that acid open-hearth steel has, even though the chemical composition of the two products give uniform results. Lloyds' Register refused to sanction the use of basic steel for shipbuilding for many years—not, in fact, until 1883—and even now only when it comes from certain manufacturers. Before any firm is accepted as producing basic steel of suitable quality numerous experiments are carried on there in the presence of a surveyor, and, if found satisfactory, it is accepted on the same basis as acid steel, subject to some additional cold-bending tests; nevertheless, most of the best work is built with acid products, because that is found to be of more uniform quality than the basic product. Tests have shown great variation in the qualities of basic plates, so that in some cases a considerable proportion of plates of a normally uniform chemical composition have shown so great variations from the standard specifications as to have been rejected. In America, the eminent bridge engineer, Mr. G. H. Thomson, will have nothing to do with basic plates.

In some experiments of Mr. Martell's, in 1883, on German basic steel it was found that adjacent flanges on the same rolled section behaved very differently; one would fracture like glass, another could be bent double while cold. Further specimens tested by temper-test bent double without fracture at a short distance from the brittle part. Again, in experiments undertaken by the firm of Dorman, Long, and Co., similar uncertainties existed, in this respect—that, though from a given blow the product would be fairly uniform, yet from another blow there would be a great variation from the first, both in increase of tensile strength and diminution of elongation. It may be mentioned, by the way, that all the steel manufactured by this firm is made by the acid and open-hearth process.

Further, in 1885, several failures occurred on the north-east coast, which did not increase the reputation of basic steel; many plates cracked during shearing and punching. Pieces shorn from these plates showed great irregularity in their physical characteristics. The tensile strength ranged from 22 tons, with 5 per cent. elongation in 8 in., to 32·6 tons, with 20 per cent. elongation. Many cold bending tests failed also; so, too, did temper tests, and annealing reduced the tensile strength too much. It was not merely that serious difficulties occurred in different blows of steel, or even in different plates, but also in test-pieces cut from different parts of the same plate. In this year, therefore (1885), Lloyds refused to sanction the use of basic steel; some basic products were so brittle in the '80's, that it was stated that "bulb-bars had broken when thrown to the ground, plates had broken through

rivet-holes and in planing plates corners had broken off."

Previous to 1886 no basic steel had been considered suitable for Admiralty work; in that year a large number of tests were made on basic steel by Admiralty overseers, and Mr. Barnaby reported, on the whole, very favourably of it. But it must be remembered that the tests were made on specimens prepared by various firms specially for purposes of investigation.

Further confirmations of the fact that results are very seriously affected by conditions other than chemical composition, are found in the conditions of working; thus, working at the blue heat, and unequal and local heating, coupled with severe flanging, will temporarily spoil the best steel. The danger of working at a blue heat is illustrated by the results of treatment of steel-plate by Mr. Webb:—

TABLE VI.

ILLUSTRATING THE EFFECTS OF WORK DONE AT A BLUE HEAT.

Condition of Plates.	Tenacity in tons per square inch.	Elongation in 10 in. per cent.
Ordinary annealed plate .....	30·96	23·6
Bent once, blue hot .....	31·95	7·5
Bent three times, blue hot .....	38·04	4·3
Bent while blue hot, and annealed .....	30·74	22·1
Hammered while blue hot .....	35·21	10·05
Hammered while blue hot and annealed .....	30·26	23·8

The evil, therefore, of working iron and steel at a blue heat (between about 470° and 600° Fahr.) is loss of ductility. Absolute strength and elasticity are increased, as in hammer hardening, but the ductility is diminished; in fact, the tests proved that the steel so worked possesses a higher tensile strength, amounting in some cases to several tons. So that it really comes to this: that working steel and iron at a blue heat reduces the material from the condition of a mild and ductile product to that of a hard and brittle one, which will break suddenly, instead of elongating gradually, thus failing in those great characteristics which are of most value in structures subject to stress and strain; yet the chemical composition remains unaltered.

The following tables will indicate the general composition of iron and steel, with their strengths, &c. Table VII. affords a comparison between mild steel and various irons, with corresponding strengths:—

TABLE VII.

ILLUSTRATING RELATIONS BETWEEN CHEMICAL AND PHYSICAL CHARACTERISTICS.

Material.	Tenacity set induced per sq. inch at tons.	Maximum stress per square inch tons.	Total percentage elongation in 10 in.	Percentage elongation corresponding with max. stress.	Iron.	Carbon.	Manganese.	Silicon.	Sulphur.	Phosphorus.	Copper.	Cinder.
Bessemer mild steel .....	19·5	27·72	24·0	19·0	99·05	·082	·63	·005	·10	·056	·02	—
Bessemer mild steel .....	19·86	29·91	26·0	15·0	99·3	·13	·463	·023	·031	·037	—	—
Siemens Martin mild steel ..	17·5	23·35	27·5	—	99·2	·192	·430	Trace	·040	·048	·021	—
Yorkshire iron best best .....	16·74	25·4	18·0	14·0	98·9	Trace	·18	·13	·013	·018	—	—
Shropshire iron .....	15·84	20·4	5·75	5·75	98·8	·045	·086	·186	·012	·208	·005	2·63
Bar iron .....	16·19	23·87	20·5	18·0	99·0	Trace	Trace	·149	·014	·309	—	—

Mild steel may contain a slightly larger proportion of some foreign elements than wrought-iron without being affected so injuriously thereby; but the larger their proportion the harder is the steel, and also the less ductile. The following tables afford a good general indication of the effect of increase in the percentages of carbon and manganese. The influence of carbon on the strength and ductility of Bessemer steel has been a matter of much experiment, and it has been clearly established that, to a certain extent, increase in this element increases hardness and diminishes ductility. Thus the following, taken from Bauschinger's experiments, are of value:—

TABLE VIII.

ILLUSTRATING THE INFLUENCE OF CARBON.

Percentage of carbon.	Breaking tensile strength in tons per sq. inch.	Elongation in 16 in. per cent.	Contraction of area per cent.
·14	28·1	21·8	49·2
·51	35·6	14·3	25·1
·66	40·0	13·7	19·7
·95	52·7	6·6	10·0

The effect of manganese as a hardening material is seen in the following:—

TABLE IX.

ILLUSTRATING THE INFLUENCE OF MANGANESE.

Manganese per cent.	Original Slate.		Hardened in Oil.	
	Breaking stress.	Elongation per cent.	Breaking stress.	Elongation per cent.
·521	Tons. 32·90	24·5	Tons. 49·58	12·0
·060	34·90	21·4	62·87	—
1·305	48·58	17·4	Cracked in hardening.	—
2·008	56·20	10·5	—	—

The effect of phosphorus is similar to, but less pronounced, than that of carbon and manganese. Though the chemical composition of a steel is of great importance, uniformity of composition is also essential to homogeneity. One of the chief disadvantages under which wrought-iron suffers by comparison with steel is its lack of homogeneity. If a bit of oxide remains fairly embedded in a piece of iron there is a severance of the iron in that part; though worked up into a structure, and its presence never suspected, it yet remains a menace to the safety of the structure if it should occur in a vital part. This is due to the method of manufacture, during which the expulsion of oxide cannot be accomplished by the formation of a liquid slag which will float upon the surface, as in molten metal. The puddled iron when it comes to nature, that is, when the elimination of the metalloids is accomplished, is in a pasty, spongy condition, and the slag, though formed, cannot float, but remains intermingled mechanically with the metal; it can only be expelled, therefore, by mechanical means, a method necessarily imperfect. It is by squeezing and hammering that the oxide is expelled from the sponge, first at the time of puddling, and subsequently after one or more reheatings. Obviously, since the presence of lamination in plates is due to particles of slag or scale imprisoned in the sponge, ball, or bloom—which, being spread out during the process of rolling, form a thin film—the greater the quantity of work done, the more likely is the expulsion of slag to be effected. Unsoundness in steel plates is more difficult to detect than that of wrought-iron plates, it is also much less frequent; but, when present, it is quite as serious—it may be of a chemical or of a mechanical character. Steel is understood far more than it was twenty years ago; but there are many points respecting it yet

involved in obscurity. It is curious that one part of a forging may have a very different chemical composition from that of another part, and the difference may be sufficient to make all the difference between a good and a bad steel. This is due to unequal heating and cooling of the ingot, and consequent liquidation; but the mechanical defects are more obvious. Happily, these are rare, and when they do occur they usually result from using an ingot too near to the honeycombing and piping at the top. The minute blow-holes become elongated when rolled out into the plate or bar, and form a seam of greater or less length. Mr. Adamson accounted for the want of homogeneity in steel ingots by the different specific gravities and melting points of the steel, and that of its constituents—carbon, sulphur, &c. Steel is 7·85 sp. gr., carbon 3·5, phosphorus 1·77, sulphur 2·0; therefore, great reliability in iron or steel could only be obtained with the metal low in alloying compounds. And this theory accords with actual facts. One of the greatest difficulties with which the early steelmakers had to contend, and which is only yet partially removed, was the unsoundness of the steel ingots. Fusing and casting insure homogeneity, as far as



uniformity of composition and absence of scale and cinder are concerned; but in the act of casting there is developed the evil of honeycombing. The practice in the early days of steelmaking, and one which is still followed, was to make sufficient allowance for the removal of those unsound portions by casting a supplementary portion at top and bottom, termed a head, which is cut off; and, in the case of ingots required for rolling, by increasing their dimensions sideways to the amount deemed necessary for the renewal of the unsound outer portions.

The fact that the exertion of sufficient pressure on the molten steel up to the moment of solidification will effectually prevent the separation of the secluded gases suggested the idea of submitting the steel while in the mould to a compression sufficient to insure this result. Steam pressure, and that of gases evolved from gunpowder, have been proposed with this object; but the only successful method of casting under pressure is that adopted at the works of the late Sir Joseph Whitworth. A solid piston, actuated by hydraulic power, is applied to the surface of the molten ingot; the pressure developed is enormous, and is maintained until the surface of the ingot is entirely solidified. Some idea of the enormous compression which takes place may be formed by the fact that an ingot subjected to this process is shortened as much as 1½ in. per foot of length by comparison with one which is cast without pressure. Sir Henry Bessemer had taken out a patent for fluid compressed steel in 1856, but did not follow it up. Whitworth filed his specification in 1865.

Sir Joseph Whitworth spent many years in developing the system. The hydraulic presses are capable of exerting pressures of from 2,000 to 8,000 tons; in some cases, a pressure as great as 20 tons per square inch has been applied. Not only solid ingots, but tubes and hoops are compressed; by varying the amount of compression, Whitworth produced steel of different grades to suit different purposes—for axles, boilers, cylinders, cranks, tyres, gun-barrels, shells, &c. The Whitworth system has not met with much favour, chiefly on account of the costly character of the plant required, which limits its use to ordnance chiefly; the plant is too costly for the making of ordinary plates.

In large masses, therefore, whether of iron or steel, the strength is not so reliable as in those of smaller dimensions. This is partly due to the difficulties of forging large masses apart from the use of heavy forging presses and hammers—partly to the lack of homogeneity; in the case of iron being due to imperfect welding; in steel due to liquation and cavities. It, therefore, often occurs that tests taken from the central and outside portions of heavy forgings show very great differences in tensile strength and in elongation. These differences scarcely concern the present subject, because large single masses are quite exceptional in constructional work.

Test-pieces, cut from the same consignment of plates, will show far less variation in steel than in iron; while there may be a variation of about 4 per cent. on either side in the case of iron, there will be practically nothing in the case of steel. Obviously the ductility of steel, being from three to four times greater than that of good wrought-iron, renders it of high value for structures, which are subject to repeated strains due to the action of live loads, sudden strains which tend to produce considerable elongation, and which may approach perilously near to the yield point, at which permanent set begins. It is advantageous to possess a material which can be trusted to sustain 16 or 17 tons before permanent set begins, and to stretch 25 per cent. before rupture can occur. In the case of bridges and viaducts, which are subject to so great vibration, and on which the rolling loads always tend to increase, the advantages of steel are so obvious that years ago, when it was twice and thrice the price of iron, it was employed for certain parts of bridge-work, in which the cheaper iron predominated.

We have now done with the composition and testing of iron and steel, and shall next consider the manufactured forms and elementary structures into which these materials are worked.

J. H.

The town council of Southampton have instructed a committee to procure plans and estimates for the erection of a crematorium at the borough cemetery. It was stated during the discussion, that such a building would cost between £2,000 and £3,000.

## COMPETITIONS.

NEWPORT, MON.—The plans of Mr. R. J. Lovell, Queen Victoria-street, London, have been adopted for the new hospital to be erected at Newport, Mon. Mr. Snell received the first premium of £100 in the competition for the best plans. The estimated cost of the selected design is £21,000.

WELLINGTON, SALOP.—In our notice last week of the result of the competition for laying-out Lord Forester's building estate we should have mentioned that the full award of the assessor, Mr. William Wright, F.S.I., of Wollaton, Nottingham, was as follows:—1st, Messrs. Mawson and Gibson, Windermere; 2nd, Messrs. Rees and Griffiths, Hamilton-street, Birkenhead; 3rd, Mr. T. Reid, C.E., Wellington; 4th, Mr. J. Holland, Sheffield.

SUTHERLAND INSTITUTE, LONGTON.—The competitive plans of the new Sutherland Institute, the foundation-stone of which was recently laid by the Prince of Wales, have been placed on exhibition at the Town Hall, Longton. Mr. W. Gilbee Scott, F.R.I.B.A., of Bedford-row, W.C., who had been engaged as the expert to advise the corporation, has awarded the first premium of £75 to Messrs. Wood and Hutchings, architects, of Tunstall, and the second premium of £25 to the same firm for a second series of plans, considering that these designs, "Knowledge" and "Compact," are nearer to the estimates than any other. Mr. Scott reported that most of the designs could not be carried out for the money proposed to be spent upon the building. The building will provide a public library and technical schools of science and art, manual training, and cookery. The estimated cost is £8,000.

## CHIPS.

The annual meeting of the Royal Archaeological Institute will be held at Dorchester from August 3 to August 10, under the presidency of Lieut.-General Pitt-Rivers. Prof. Boyd Dawkins will preside over the Antiquarian Section, and Sir Henry Howarth over the Historical.

In order to deal more effectively with the traffic on the lines between Ruabon and Bala, which have become the property of the Great Western Railway Company under their Act of last session, it has been determined by that company to forthwith double the line from the junction with the main line near Ruabon to Llangollen, a distance of 5½ miles, and to carry out various important improvements on the remaining sections. For these alterations a sum of £37,000 will be required.

At Brampton, Huntingdonshire, an institute has been erected on the site of Whitehall House, and has been given to the village by Mr. John Newberry. The lecture hall is 45ft. by 20ft. The architect was Mr. John Bird, and the builder Mr. Allen, both of Brampton.

For the ventilation of the Girls' Intermediate School, Abergavenny, Mr. E. A. Johnson, architect, Messrs. Cousland and Mackay's ornamental design S "Climax" patent direct-acting louvre ventilator has been used and supplied from their works at Glasgow.

At Calverstock Church, Devon, a three-light stained-glass window has been placed in the north aisle as a memorial. The central subject is the Resurrection of our Lord, and on either side are figures of David and Nimrod. Mr. F. Drake, of Exeter, carried out the work.

Owing to the leakage of the old dock gates at the graving dock, Port Glasgow, it was decided a year since to replace them with new ones. The contract to supply new gates was placed with Messrs. McKnight and Co., Ayr, at a cost of about £800. These have now been completed, and at a test which took place on Saturday, the new gates were found to be practically tight. The piling dam will be removed as speedily as possible, and the dock reopened. The cost of the alterations, including loss of rental, has been £3,000.

The great north transept window in Doncaster parish church, which was destroyed by a gas explosion some time ago, has been filled with new stained glass illustrative of the *Te Deum*. The six main lights are filled with three tiers of figures representing Cherubim and Seraphim, apostles, prophets, and martyrs, as well as SS. Ambrose and Augustine, the joint authors of the *Te Deum*. The figures are surmounted by canopies, and along the base of the lights is written "*Te Deum laudamus te Dominum confitemur*." The Mowbray window on the south side has been replaced by three lights containing figures of Holy Matrons. The whole work has been designed by, and carried out under the direction of, the architects, Messrs. Demaine and Brierley, York.

## Building Intelligence.

LUNDY ISLAND.—The new church of St. Helena, Lundy Island, built from plans by Mr. John Norton, F.R.I.B.A., of Ridgmount-gardens, W.C., is approaching completion. The church is built of a red-grey granite, with dressings of Douling stone. The interior walls are lined with red brick throughout, relieved by bands and diaper of blue Staffordshire and cream-coloured Marland bricks. There is a chancel arch, carried by polished Purbeck marble columns. Two granite steps bring the worshippers to the floor of the chancel, and two more to the altar rails. A dwarfed screen of carved stone divides nave and chancel. The altar rails are of oak, upon brass standards. The foot pace upon which the oak altar stands is of Devon marble. There is a sedilia upon the south side of the sanctuary, and opposite thereto a carved piscina. The east window is a three-light one, and filled with stained glass, the subject being an illustration of the Belief. Immediately beneath the window is a carved and sculptured reredos. The super-altar is of polished veined alabaster, and the main portion of the reredos proper consists of three divisions, gabled and crocketed, and divided from each other and flanked by clustered columns of Purbeck marble. The sculpture is in exceptionally high relief, the central panel representing the Last Supper, whilst that on the dexter side shows the Institution of the Passover, and on the sinister of the Scape Goat. The pulpit is of carved stone, and the font is of the same material upon a grey granite step. There are encaustic tiles from Largswardine, Herefordshire, in the chancel and sanctuary floors, whilst the floors under the seating, which, like the stalls, are of oak, are of wood-blocking. The eagle lectern is of oak. The roofs are waggon-shaped and open. The contractors for the general work are Messrs. Britton and Pickett, builders, of Ilfracombe. A figure in a niche of St. Helena, the pulpit, altar, screen, font, &c., as well as the sculptured reredos and other sculpture, are the handiwork of Messrs. Harry Hems and Sons, of Exeter.

MORLEY.—The corporation are about to erect a set of public baths on a site fronting on to Fountain-street and opposite the proposed electric generation station. Out of the fifteen plans that were sent in, the committee having charge of the scheme have chosen those submitted by Messrs. Holtom and Fox, of Dewsbury, the firm of architects who some years ago designed the bath premises at Burnley. In the centre, where the bath superintendent will have his home, the building is to be two stories high; the rest of the structure will be a single story. The manager's house will consist of a couple of bedrooms, a kitchen, and a sitting-room. There will be two entrances to the baths. On the left will be the men's slipper baths—two first-class and four second—two shower baths, a needle bath, and a vapour bath. The length of the first-class bath will be 65ft., the breadth 24ft., and the depth will vary from 3ft. to 6ft. The entrance on the right-hand side of the building will lead to the ladies' slipper baths, six in number, and the second-class swimming bath of the regulation dimensions (water measure)—viz., 75ft. by 30ft. A spacious gallery has been provided, running the greater part of the way round the room. Dressing boxes of wood, with slate partitions, 3ft. 9in. square, are arranged on two sides of the room. Both of the swimming baths are to be lined with glazed bricks, and adjoining each will be a small soap bath. The estimated cost of the scheme is £6,000.

A poll of the Gravesend ratepayers has been taken respecting the proposed purchase of the local waterworks by the corporation, and resulted in a majority of 242 against the proposal.

Mr. Robert Crawford, engineer to the Greenock Harbour Trust, who was asked to report on the proposed extension of graving dock accommodation at that port, estimates that it will take about £35,000 to widen, alter, and lower the bottom of the dock, and that it would take at least fifteen months to carry out the alterations. He further reports that even with this expenditure the requirements of all classes of vessels would not be met. On the question of constructing an entire new graving dock at an estimated cost of £90,000, the Harbour Trust is not satisfied that there is any possible traffic sufficient to warrant such a large expenditure.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LIV., LVII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

T. L. (The best place for all such fittings is Evered and Co., Drury-lane. You will get an infinitely better article there at a third of the price charged by the people you mention.)

RECEIVED.—L. M. and W. F. Co.—J. G. F.—A. J. R.—L. P. C.—H. W. G.

## "BUILDING NEWS" DESIGNING CLUB.

"DON'T KNOW" and "TOO MUCH TROUBLE." (By "Renaissance" we do not limit the competitors to any exact period, and you are at liberty to make your own choice.)

## Correspondence.

NEW TOWN HALL FOR ENNISKILLEN.  
To the Editor of the BUILDING NEWS.

SIR,—With your permission I desire to call attention to an advertisement which appears from the Commissioners of the Borough of Enniskillen inviting architects to submit designs in competition for a new town hall. The proposed expenditure is £7,500, and sums of £50, £20, and £10 are offered as first, second, and third prizes, with the condition that "The successful plans and designs are to become the absolute property of the Commissioners to adopt in whole or in part, as the Commissioners may deem desirable or necessary, without further payment to the successful competitors."

It is to this condition I take exception as being a most insidious attempt on the part of a public body to obtain work of an exceptionally valuable description and evade payment for it at its ordinary market price. As this is an open competition the profession throughout the three kingdoms, and not the profession alone, but everyone in sympathy with it, and every lover of fair play, are equally concerned in the terms under which it is to be held.

The uniform practice in such cases is that the author of the selected design is intrusted with the carrying out of the work, receiving the usual fees, in which the amount of his prize becomes merged. In this case the fees would amount to

£375, and, as the work might possibly extend over a couple of years, the remuneration seems only reasonable, especially when it is remembered that it includes a large amount of necessary and subordinate work and office expenditure.

The Commissioners of Enniskillen have no doubt a duty to the ratepayers to discharge, but I shall be surprised to learn that it forms any part of their duty to have recourse to such questionable devices for the purpose of obtaining the plans for their new town hall; nor is it setting a good example when men of means and social standing stoop to such methods, and seek to break through a rule which has received the sanction and approval of the general public, and, as a time-honoured custom, has become one of the unwritten laws of the land.

In conclusion, permit me to add that I fail to see any real economy in the course proposed, for, needless to say, it does not follow that the difference between the first prize and the usual fees is going to be saved for the rates; whilst, if the condition be insisted upon, it is certain the best men in the profession, or those amongst them who might feel disposed to join in the competition, will not touch it, with the result that a large amount of money may be expended upon a possibly inferior design, and an opportunity be thus lost of securing for the town and community of Enniskillen such a work as would be a permanent testimony alike to their public spirit and love of art.—I am, &c.,

L. MOORE.

Queen Anne-villas, Rithmines, Dublin.

## THE DIVINING-ROD.

SIR,—If "Lincoln" will blindfold his friend when next he uses the divining-rod in his presence he will ascertain if my statement as to its efficacy is true or not.

It is well-known that carrying a forked twig for the purpose of discovering water is followed by many respectable persons; but it will, I believe, be found that the force moving the rod is applied (possibly unconsciously) by the hands of the operator, as described in my former letter, and not by any hidden influence.

Those who make a business of water-finding are generally intelligent and observant men, who note, and use as their guide, the form and face of the ground, the nature of the soil, and the plants which grow on the soil.

That "Lincoln's" friend or any other professor discovers water by means of the superstitious divining-rod, and by it alone, has yet to be proved.—I am, &c.,

Feb. 18.

NEMO.

## WOODWARD v. ALLEN.

SIR,—The case of Woodward v. J. Allen and Son may alarm and make some of us sit up. To be forcibly obstructed in the execution of one's duty by a band of Metropolitan condottieri is a new form of boycott.

So far as I am concerned, in all future contracts I shall insert a heavy penalty clause, with power of dismissal, to meet the case, and, if treated as Mr. Woodward has been, will refuse certificates for payments, and be very guarded in the selection of those I employ.—I am, &c.,

T. E. KNIGHTLEY.

106, Cannon-street, E.C., Feb. 23.

Princess Henry of Battenberg was in the City on Tuesday, and bought some chimneypieces and dog grates at Messrs. Geo. Wright and Co.'s Queen Victoria-street showrooms, for her house in the Isle of Wight.

Major-General Darley Crozier, an inspector of the Local Government Board, held an inquiry at Heywood, Lancs., on Friday, on behalf of the Local Government Board, into the application of the town council to borrow £20,000 for the gasworks, and also to acquire or appropriate lands for a new post-office, to erect a new office, and to borrow money for that purpose. Of the £20,000 it was wished to borrow, £10,000 was required now, and the other £10,000 would be required shortly. Evidence in support of the application was given by Mr. James Diggle, C.E., and the gas-manager, Mr. Walter Whatmough.

The Benchers of Gray's Inn have resolved to remove the disfiguring stucco from the exterior of their fine old hall, and to restore it, as nearly as possible, to its state when originally erected. The work was begun on Friday last. Queen Elizabeth often visited the hall, and its finely-carved oak screen and several of the dining-tables were, according to tradition, a gift from her to the society.

## Intercommunication.

## QUESTIONS.

[11629].—Deal.—Will someone of your readers who is an expert kindly define the difference between "yellow" and "red" deal, as applied to shipments from the Baltic and its neighbourhood? As far as I can gather, yellow refers to the lighter and less resinous description, coming from Christiania, Petersburg, and Archangel, in contradistinction to most of the Swedish varieties (with the exception of those from Gefu and Soderham), which are coarser, and of a redder colour. Flooring is invariably specified as "yellow" deal when of a superior quality, and the deals used to be equal to those coming from the ports I have named.—SYLVESTRIS.

## REPLIES.

[11533].—Iron Railings.—In your issue of Nov. 6 it is stated "these can be fixed with sulphur." &c. As a subscriber to the BUILDING NEWS for the last 40 years, I trust I am not too late to prevent anyone adopting that mode, which has been very largely used in the Melbourne General Cemetery some years back, with the result in every case of bursting the stone kerb, &c.; these now have to be replaced and leaded in.—MAJOR A. PINCHAS, C.E., Surveyor to the Trustees, 37, Selborne Chambers, Melbourne.

[11622].—Quantities.—It is impossible to give a complete list of the mode of measurement in Yorkshire, as it differs in various parts of the country, and only surveyors with an extensive practice know the rules of the different parts, and that is the reason why architects supplying quantities by London quantity surveyors always receive tenders at quite 20 per cent. more than they would do if quantities from the same plans were prepared by a Yorkshire surveyor. The mere fact of measuring by rods is nothing, as yards are understood all over. I have had experience of both practices, and there is much less chance of a lawsuit afterwards. If the quantities are prepared in the town, the builder will tender from a London man in Yorkshire.—W. H. WOOD.

## CHIPS.

After undergoing extensive alterations and additions, the Free Methodist chapel, at Helston, which has been closed upwards of fifteen weeks, was, on Wednesday week, re-opened for Divine service. The premises have undergone complete transformation within, the contractors being Messrs. Winn and Son, for the carpentry; Messrs. Wearne and Son, for the masonry; and Mrs. C. Eddy (under the management of Mr. White), for painting and decorating.

The Royal Hotel, Prince's-street, Edinburgh, is about to be remodelled internally. The architect for the work is Mr. J. Macintyre Henry, Edinburgh.

Oxford congregation has decided to spend a sum, not exceeding £1,750, in the restoration of the pinnacles and battlements on the clerestory of the nave of the University Church of St. Mary's. Mr. T. G. Jackson, R.A., who restored the famous spire and its cluster of pinnacles, has prepared the designs. The present parapet was the creation of Sir Gilbert Scott, a previous one having been blown down between 1500 and 1520.

Mr. David Clarke died at his residence, Stalybridge-road, Ashton-under-Lyne, on Monday, after a lingering illness. Deceased was a well-known figure in the gas world. He occupied the position of under manager at Oldham gasworks for 18 years. Subsequently he became manager of the Glossop gasworks, and 21 years ago obtained a similar appointment at Ashton. He was 64 years old.

On Saturday afternoon there was publicly opened at Newsham, Northumberland, the new institution which the workmen at the village have caused to be erected for the purposes of a reading-room and recreation hall. The building has been erected from plans gratuitously executed by Mr. John Goulding, jun., of Blyth. The Seaton Delaval Coal Co. also provided the bricks free. The building contains on the ground floor a large hall, 32ft. by 24ft., fitted with two billiard-tables; and on the first floor a news-room, 21ft. by 24ft., and a smoke-room, 10ft. by 3in. by 15ft.

In commemoration of the eightieth anniversary of the birth of Mr. G. F. Watts, an address of congratulation, signed by many of his friends and admirers, was presented to the distinguished artist on Tuesday at his residence, Little Holland House, by the directors and secretary of the New Gallery, where a collective exhibition of Mr. Watts's work is now being held.

At Monday's meeting of the Edinburgh Royal Scottish Society of Arts, a committee appointed to consider a paper by Dr. Purvis on sewage precipitation reported that, in their opinion, Dr. Purvis had failed to show that there was anything novel in the application of lime and carbonic-acid gas to the treatment of sewage, as these have been previously suggested, and even patents obtained for their application, and that he had not proved that carbonic-acid gas and lime would effectually and economically effect the purification of the usual town's sewage in the way he suggested. The report was approved.



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## ILLUSTRATIONS.

THE WEST FRONT OF PETERBOROUGH CATHEDRAL.—  
NATIONAL BRONZE MEDAL DESIGNS FOR BOOK ILLUSTRATION.—FRENCH SIXTEENTH-CENTURY OAK COFFER.—  
HOUSES AT NOTTINGHAM.—NEW BANK AT ST. AUSTELL.—  
PRESBYTERIAN CHURCH AND SCHOOLS, PORT MADOC.—  
NEW OPERATING THEATRES AT ST. GEORGE'S HOSPITAL.

## Our Illustrations.

PETERBOROUGH CATHEDRAL\*: WEST FRONT.

THE accompanying fine photographic view was taken by Mr. R. Scriven, of Castle Ashby, immediately before the erection of the immense scaffolding which now encases the major portion of the building. Readers will note that the builder's carts are seen bringing in materials for the needling and shoring which has had to be put up. The immediate cause of the danger no doubt was the giving way of the thin layer of gravel below the footings of the great piers, and these foundations, instead of originally spreading in area as they should have done, actually diminished and shelved inwards, a mode of construction which needs only to be named to be condemned, but which may possibly have been occasioned by the difficulty of water in the site when the church was built. Anyway these piers, which in themselves are perfectly solid and well built, have been thoroughly underpinned by Mr. Thompson, the builder, under the direction of Mr. J. L. Pearson, R.A., the architect. Amidst the rubble and rough, loose stuff the clerk of the works, Mr. Irvine, discovered the fragments of a large stone lavatory from the cloisters of an earlier church. It now stands in the mason's yard, having been pieced together, with its solid basins radiating in form like the bowl of a fountain. The Mediaeval builders seem to have had little regard for the work of their predecessors, for they evidently broke up this old lavatory and thrust it in the trenches as so much spare rubbish. Their mortar has been shown by Mr. John Hughes, F.I.C., the analyst, to have been of very inferior quality, being exceptionally brittle, and consequently incapable of standing much lateral pressure. From all the joints of the upper part of the structure the mortar has washed out and crumbled away to a considerable depth, leaving open joints. The masonry of the walls was constructed with absolutely no tie or

bond-stones, so that the ashlar facing on both sides of the westernmost wall, and more particularly on the outside, has had to withstand the pressure of the loose rubble and rotten mortar fillings, which may be correctly described as being of the consistency of road-sweepings. Parts of the ashlar work are so disintegrated and shattered by the overhanging settlements and dislodgments occurring from time to time that the back faces of some of the facing stones can be seen from the front of the wall; indeed, in some places the ashlar work is only 3in. or 4in. thick. The main weight of the great gables being carried over the outer orders of the main arches below has materially increased the danger of the fabric, which has burst forward about 3ft., both horizontally and vertically, tearing the gables and piers away from the groining of the narthex, and leaving a gaping fissure of about 18in. to 2ft. wide to the rear of the spandrels of the arcade, and causing another series of rents in the vaulting of a most serious character. So great has been the pressure upon the outer order of the arches that they have become flattened and driven out of form, and consequently partake more the shape of four-centred arches, so much are they buckled. The wall-shafts have so rotted in places that their bottom ends assume the contour of pointed pencils, while here and there the shafts of the groining, &c., are nothing more or less than scaffold poles besmeared with mortar to resemble masonry. The arcade wall-shafts, it is interesting to note, were never jointed with mortar, but have beds of thin sheet lead tied into the wall by iron cramps, the bite on the lead of the coarse Barnack stone serving to hold the shafts in position. No chemical action between the metals seems to have taken place, and, as a matter of fact, the stone is most solid where these joints occur. The turret next the north gable has, by Mr. Pearson's orders, been tied in by an iron band to the tower at the rear of the façade. The north gable seen in our view has been taken down entirely to the crown of the arch. All the stones have been numbered, and the rose window now lays *in situ* upon the main scaffold under the big central archway. A drawing has been made of the gable with every stone figured in numerals, which correspond with the mason's marks on the ashlar itself. Another cause of the ruined masonry was the insertion of timber cantilevers into the walling of the spandrels to carry the purlins on a sort of queen-post, contrived by the 17th-century carpenters when the roofs were renovated behind these gables after the work had been left exposed to the elements for many years during the Civil Wars. Every time the wind presses upon the roofs these cantilevers are necessarily more or less acted upon, and in this way exercised a very baneful influence upon the overhanging tons of masonry which have had, and can have, no tie eastwards without rebuilding. In all probability the whole of the upper part of the façade will have to come down, and the Dean and Chapter of Peterborough have just bought an ancient farmhouse, constructed of stone exactly like that used in the cathedral, so as to make good the rotten masonry with good material corresponding with the old work as nearly as possible. Our photograph has been produced and published as a fine large carbon print by the Autotype Company, London, who have, we understand, some other views of the building enlarged by them from the original negatives taken by Mr. R. Scriven.

KING THRUSHBEARD: NATIONAL BRONZE MEDAL DESIGN.

THESE masterly designs well deserved the National Bronze Medal which was awarded them at the last students' exhibition at South Kensington under the class of "Book Illustrations." Mr. Henry M. Brock, of Cambridge, is their author, and we think his work evinces much promise and thoroughness of character. The subject illustrated is the familiar story of King Thrushbeard from "Grimm's Fairy Tales." The legends under the pictures indicate the scenes depicted.

AN OAK CHEST OF THE TIME OF FRANCIS I.

(For description see page 304.)

HOUSES, NOTTINGHAM PARK.

THESE houses are built on a steep site in Nottingham Park, overlooking the Trent Valley, for Mr. A. Marshall. They each comprise three reception-rooms and six bedrooms, offices, &c. The cost was about £1,800, and they were built by Messrs. Barlow and Whittaker, under the super-

vision of the architects, Messrs. Marshall and Turner, King-street, Nottingham.

NEW BANK, OFFICES, ETC., AT ST. AUSTELL, CORNWALL.

THIS building, just commenced, will stand on the site of the old post-office, one of the most central and commanding positions in St. Austell, Cornwall, the headquarters of the china-clay trade, from which the pottery districts are supplied with the raw material for their better-class goods. It will be erected in pink terracotta, from the works of Mr. Henry Dennis, of Ruabon, from the design of the architect. The ground floor will have the banking-room and manager's office facing the Bull Ring, and to the right and left of this a series of shops, as shown by the plan. Above this the entire building will be occupied by offices for the old county firm of Messrs. Coode, Shilson, and Co., bankers and solicitors, the senior partner of whom, Mr. William Coode, is Clerk of the Peace for Cornwall, as was his father and grandfather before him. The fittings throughout will be complete in character, the lighting will be by electricity, and there will be telephonic communication to and from the several parts of the premises. The architect is Mr. Silvanus Trevail, F.R.I.B.A., of Truro; the contractor is Mr. W. H. Smith, of St. Austell, and the clerk of the works is Mr. Thomas Parsons, of Truro.

THE NEW OPERATING THEATRES, ST. GEORGE'S HOSPITAL.

(See description on page 303.)

## CHIPS.

The council of the Sanitary Institute have accepted an invitation from the City Council of Leeds to hold a Sanitary Congress and Health Exhibition in that city in September.

Before Mr. Justice Wills and a common jury an action was tried last week, "*De Sziemanowicz v. Hateley*," in which the plaintiff, a sorter at the Post Office, sued the defendant for damages for breach of warranty and fraudulent misrepresentation in regard to the condition of the drains at a house in Chatterton-road which the plaintiff had taken on the strength of a statement by the defendant that "on the word of a Christian man, the drains had just been done on the latest sanitary principle." The drains were afterwards found to be defective; three of the plaintiff's children died, and his wife suffered from illness. The jury found for the plaintiff, with £65 damages.

The proposed railway up the Jungfrau is about to be commenced. The maximum gradients will be 1 in 4, and the sharpest curves of 328ft. radius. The power will be supplied by turbines, some 4,500H.P. being available. Electro-motors will be used for traction purposes, the current being obtained from overhead conductors. The total length of the line will be about 7.6 miles, the total rise in this distance being 6,555ft.

The stone that the builders rejected has become the head of the corner. When, in 1879, a Wesleyan Church was built at Upper Tooting, Mr. Harry Hems, of Exeter, was commissioned to carve a statue of John Wesley, to occupy a niche over the main entrance. This was done, but those in authority soon had the statue removed. A new pulpit and screen of oak has just been placed in Barnes parish church, having in groined niches, statues of England's six greatest preachers. The list is as follows: St. Augustine of Canterbury, the Apostle of England; St. Aidan, Bishop of Lindisfarne; St. Hugh, of Lincoln; Latimer, the martyr; John Wesley, and Canon Liddon. The pulpit has been made in its entirety by Messrs. Harry Hems and Sons, of Exeter, who carved the statuette of Wesley from the same model as was used for the rejected statue of Upper Tooting.

A large extension has just been made to the premises in Whitefriars-street, E.C., of the Argus Printing Co., from the drawings of Mr. Chas. Val. Hunter, C.C. The foundations were put in by Messrs. Greenwood, and the superstructure has been erected by Messrs. Patman and Fotheringham. The lower part of the building is in massive blocks of Portland stone, and the upper part in Ruabon terracotta. The floors are all fireproofed on the Fawcett system.

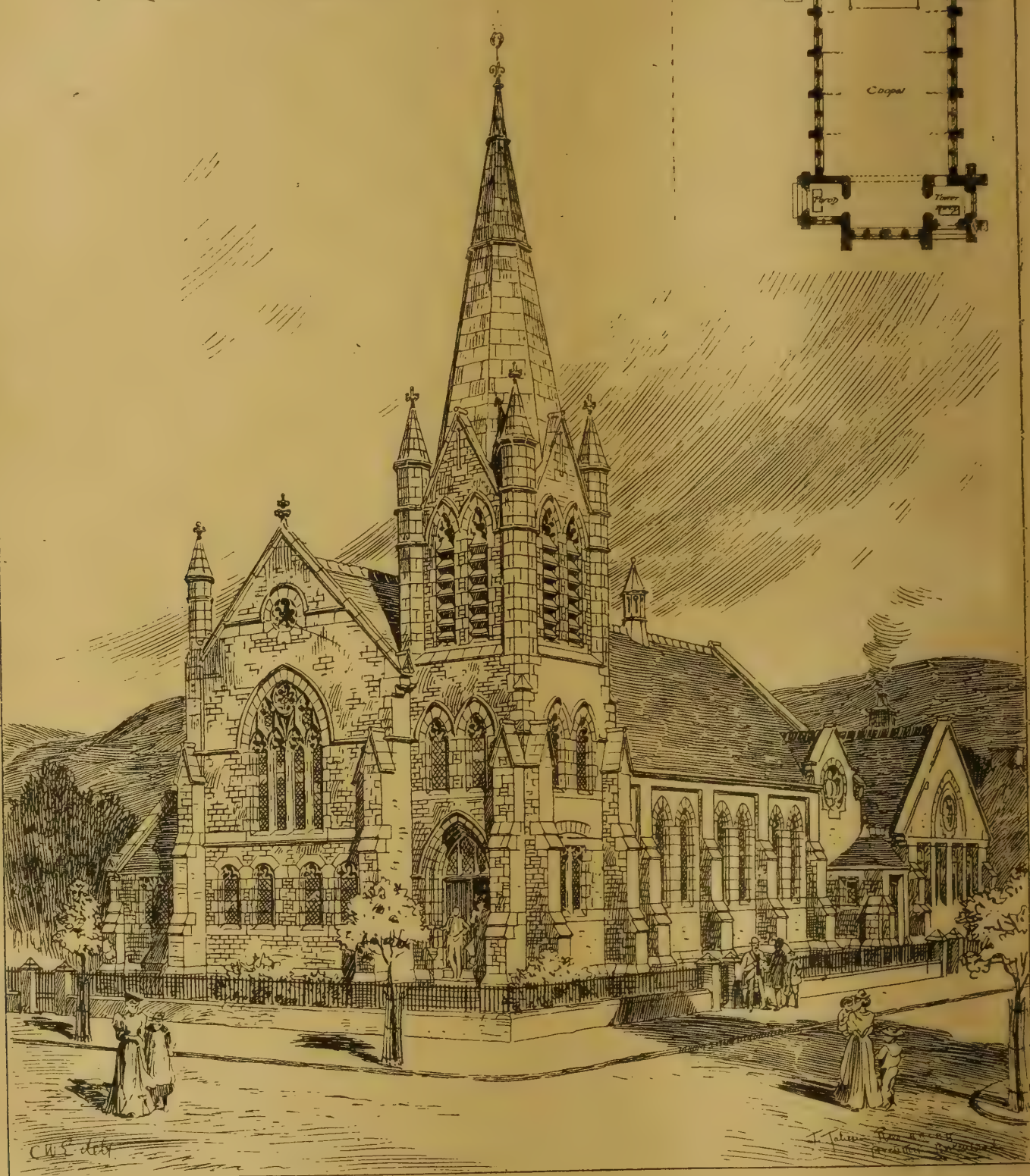
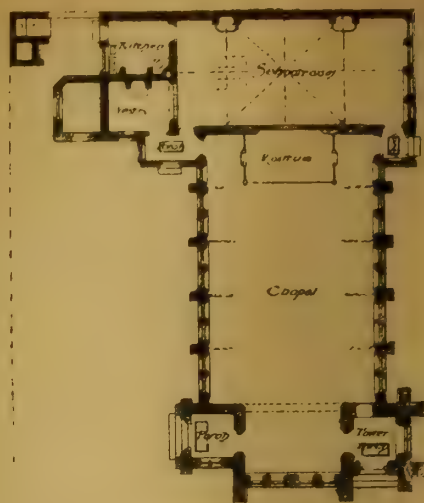
The appeal of Mr. George Waddell, the surviving partner of the firm of Messrs. Waddell, contractors for the Mersey Railway, who contested an order of Mr. Justice Stirling as to whether the learned judge was right in directing that £7,500 out of the accumulated fund of £17,418 should, subject to costs, be applied to the payment of interest on debenture stock subsequent to the first of the company, has been dismissed by the judges of the Appeal Court with costs.

\* The following illustrations of Peterborough Cathedral have appeared in the BUILDING NEWS:—Ground plan, cloister and close arrangements (by the late Rev. MacKenzie E. C. Walcott), Feb. 8, 1878; ditto, monastery and its church (also by Mr. MacKenzie Walcott), July 5, 1878; west front, as seen from beneath arch of western gateway (by Edwin G. Hardy), Feb. 24, 1882; Cathedral from north-east, showing the "Dean's chimneys"—the lofty pinnacles added to central tower by Dean Kipling at the beginning of this century—the tower has since been rebuilt without these features from the designs of Mr. Pearson (by Maurice B. Adams), Jan. 26, 1883; north-western transept and towers (by Thomas Cox), April 29, 1870; Cathedral from Market-place (small sketch by Joseph Pennell), Feb. 10, 1893; section central tower, Jan. 26, 1883; section of transept (by the late Viollet-le-Duc, Dec. 19, 1873; pinnacle of south-western transept (by E. Wimbridge), Feb. 21, 1868; and cenotaph to Archbishop Magee, designed by Mr. Pearson, Oct. 13, 1893.



PRESBYTERIAN CHURCH & SCHOOLS.  
PORTMADOC NORTH WALES.

T. TALIESIN REES A.R.I.B.A. ARCHT.



PRESBYTERIAN CHURCH AND SCHOOLS,  
PORTMADOC, NORTH WALES.

THESE buildings are now nearing completion, with the exception of the spire, which it is proposed to complete at some future date. A temporary slate spire has been erected for the present. The buildings are designed to accommodate 300 to 350 in the chapel, and 150 in the schoolroom, with vestry, kitchen, heating chamber, &c. The materials of outer walls are of Penycie stone, Minffordd shoddies being used to front elevation, and Runcorn stone for tracery and dressings.

The interior woodwork is of pitchpine. The contractor for the first portion of the work was Mr. John Shaw, Birkenhead, and the completion is being intrusted to Mr. Evan Jones, contractor, Groeslon, Carnarvon, North Wales. The designs are from the office of Mr. T. Taliesin Rees, A.R.I.B.A., architect, Birkenhead, who was successful in obtaining the work in open competition. Thirty-one sets of designs were submitted to a professional assessor.

The Duke of York has promised to open the new wing of the Royal Engineers' College at Keyham.

The new works constructed by the water company at Farnham, Surrey, are now practically completed. They are situated 300ft. above the sea-level, on one of the highest points in the district, and command all parts of the town, the Bourne, and Wrecclesham. They consist of two filter-beds of 2,000sq.ft. each, with a depth of filtering material of 2ft. 9in., and a covered service reservoir with a storage capacity of half-a-million gallons. The filter-beds in duplicate, and the system of filtration adopted, are the scheme of Mr. J. W. Lewis, the company's engineer and manager. The object of the system is to extract from the water the iron with which it is highly charged.





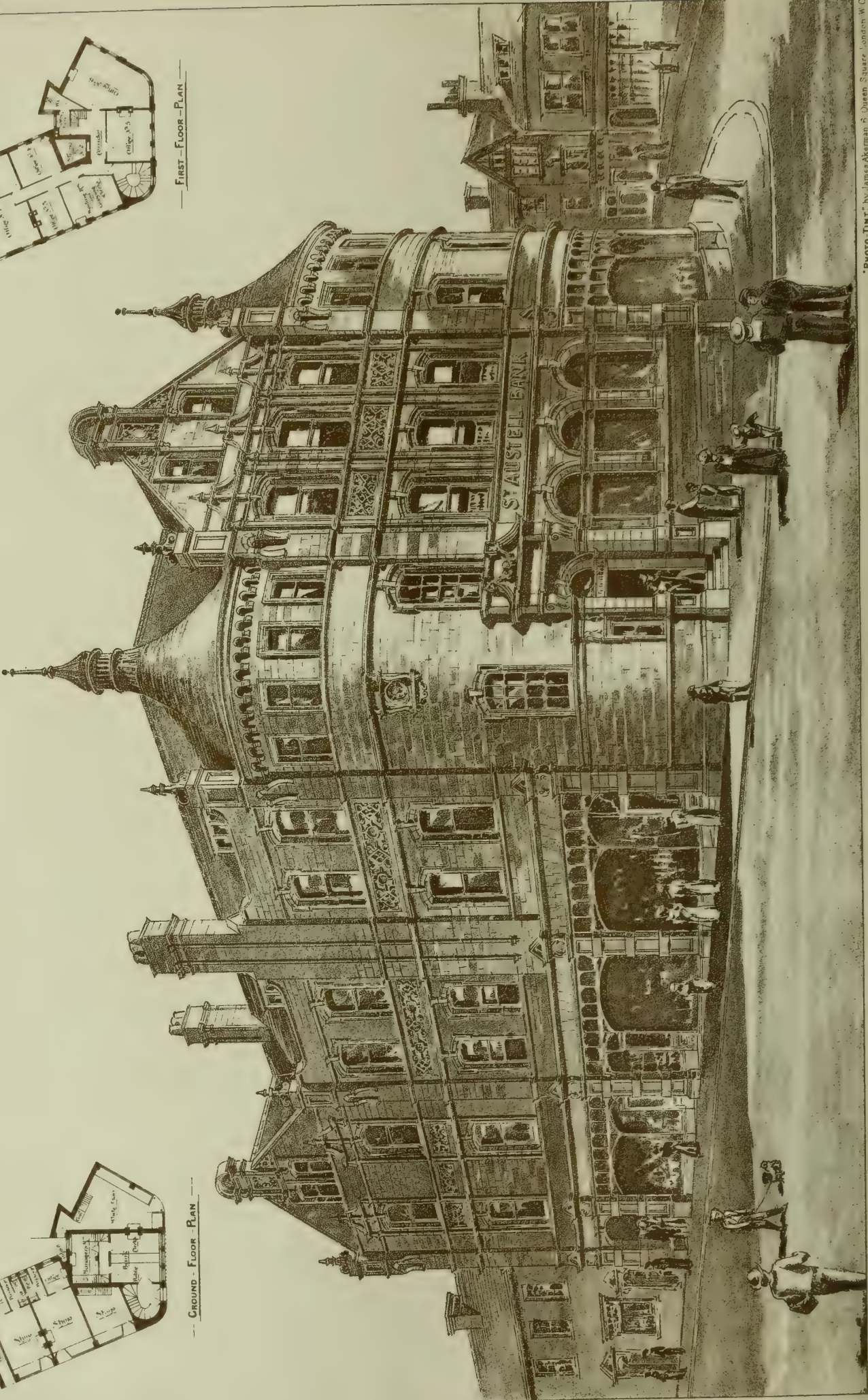




GROUND FLOOR PLAN



FIRST FLOOR PLAN



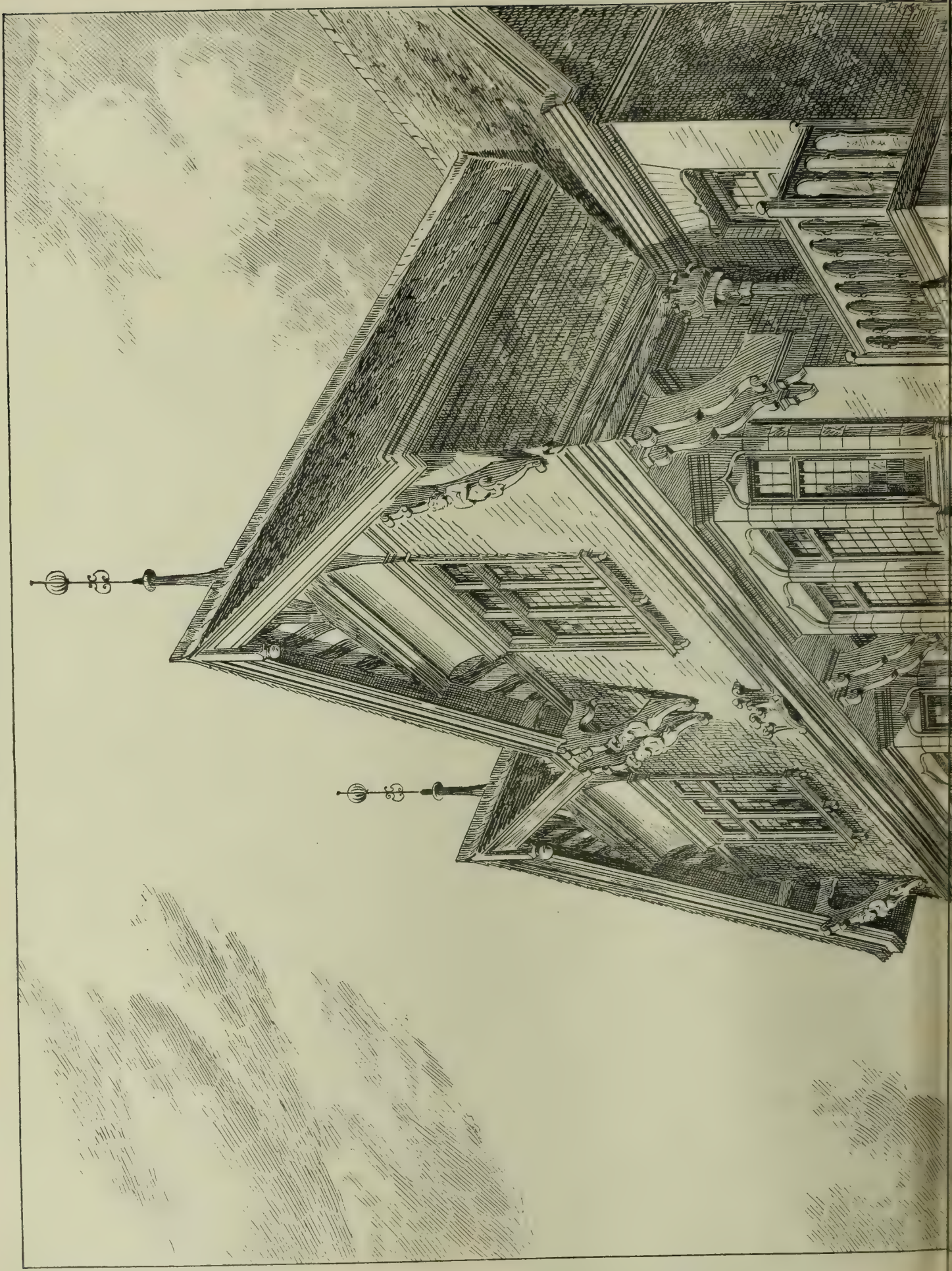
NEW BANK SHOPS & OFFICES ST AUSTELL CORNWALL FOR MESSRS CODE SHILSON & CO SILVANUS TREVAIL ARCHT

"PHOTO-TINT" by James Akerman & Queen Square London W.C











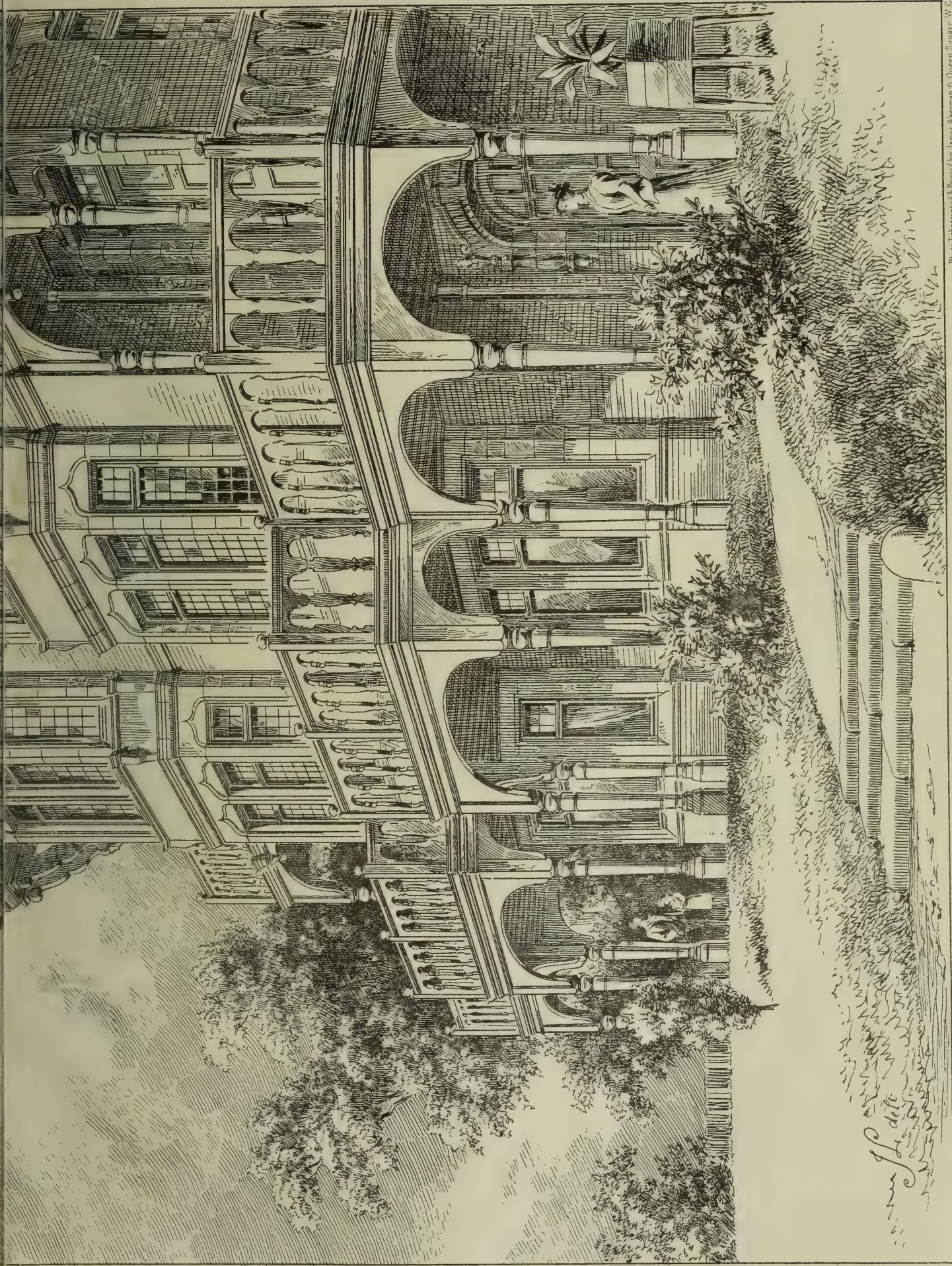


Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

HOUSES AT NOTTINGHAM. MESSRS MARSHALL & TURNER ARCHTS











# King Thrushbeard.



The Proud Princess  
derides her Suitors  
and will have none  
of them. ~ ♦ ~



## Ring Thrushbeard.



**R**ing Thrushbeard in  
the guise of a beg-  
gar-man leadeth away  
the Proud Princess.







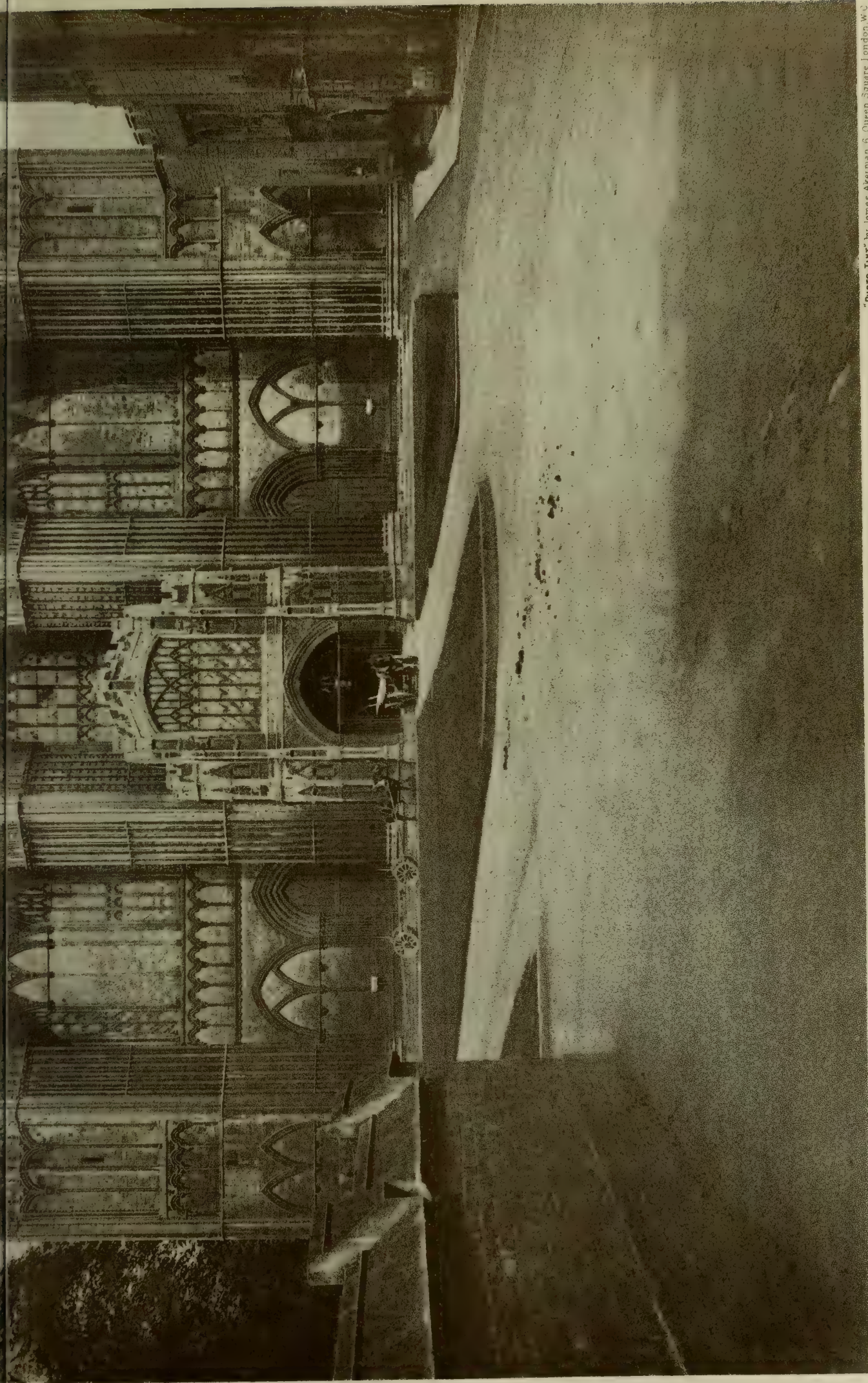




THE BUILDING NEWS, FEB. 26, 1897.







"PHOTO-TINT," by James Akerman 6, Queen's Square, London, W.C.

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## PETERBOROUGH CATHEDRAL THE WEST FRONT

VIEW TAKEN IMMEDIATELY BEFORE PRESENT RESTORATION WORKS









FRENCH · 16<sup>TH</sup> CENTURY · OAK · COFFER

FROM "FRENCH WOOD CARVINGS" BY ELEANOR ROWE.



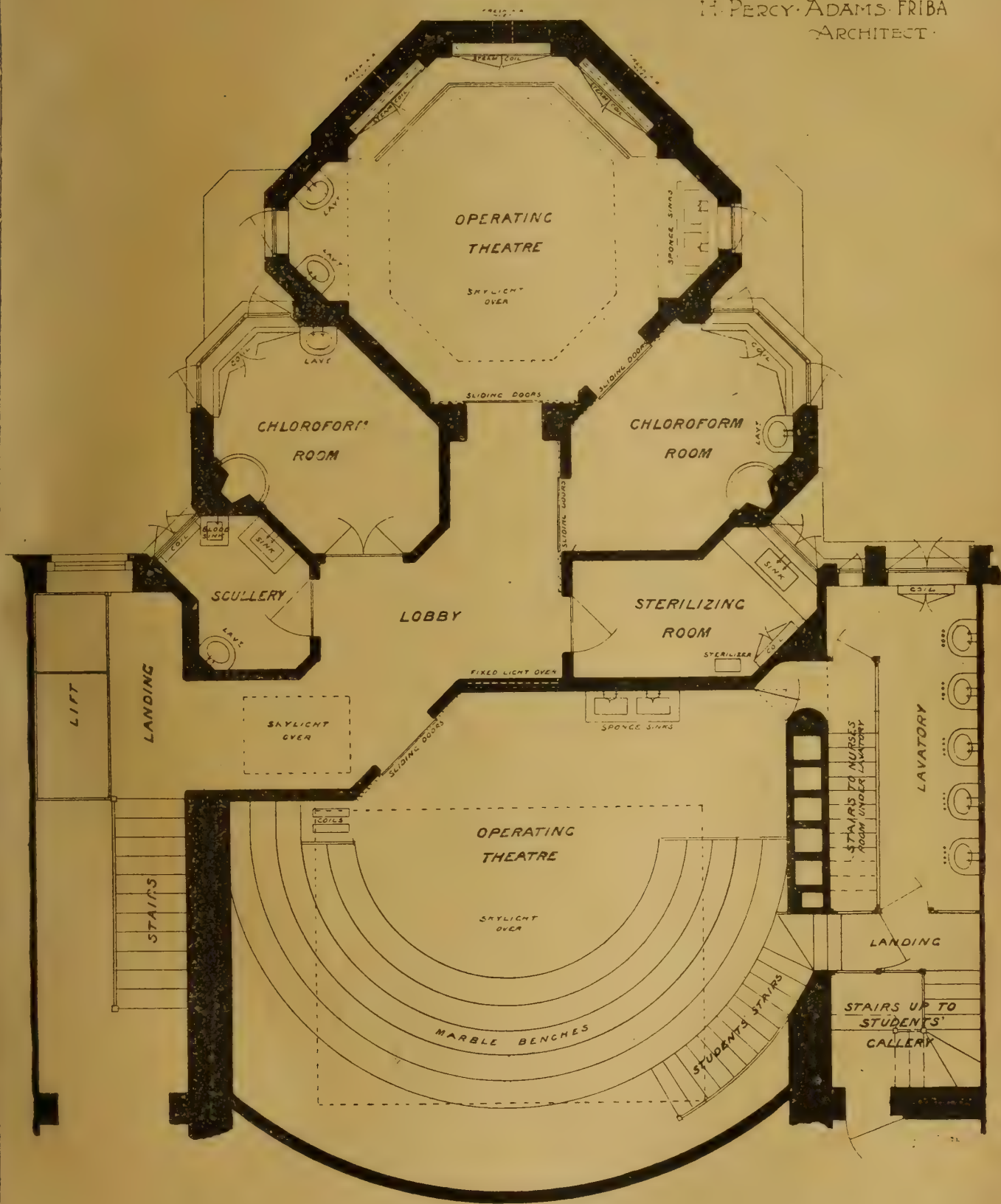




NEW OPERATING THEATRES

AT ST GEORGE'S HOSPITAL LONDON W.

H. PERCY ADAMS FRIBA  
ARCHITECT



C O R R I D O R  
SECOND FLOOR PLAN





## OBITUARY.

THE death is announced of Mr. WILLIAM DAWES, more widely known as "Eljer Goff." He was born at Gloucester in 1840, and studied and practised architecture in London, Birmingham, and Donbigh, and then went to Manchester. In the great competition for the Manchester Town Hall he stood eleventh on a list of thirty-six. On professional topics Mr. Dawes contributed to the BUILDING NEWS and other journals, and was also known as the writer of many numerous sketches, which appeared under the pseudonym of "Eljer Goff." These attracted attention, and were very successful in pamphlet form. The most important were collected into a volume entitled "The Works of Eljer Goff."

New schools which have been erected in connection with the Nutgrove Wesleyan Chapel, St. Helens, Lancs., at a cost of £2,400, were opened on Thursday in last week.

The contractors for new Cruden Railway, Messrs. Brand and Son, Glasgow, invited a party of about seventy of the inhabitants in Ellon to have their first journey by train to Port Errol on Saturday. There is yet about half-a-mile in the vicinity of Bulters of Buchan to be made, and the line is expected to be opened in July.

From time to time interesting remains of Roman date have been found on Castle Farm, Whittington, on the outskirts of Ipswich, the property of Mr. Henry Orford, including a fine tessellated pavement discovered in 1870, and now in the local museum, and a very large vase found two years ago. Last week some workmen were engaged in digging a trench across a meadow which has recently been turned into an orchard, and came upon another large piece of pavement. From it the earth has been carefully removed. It consists of small pieces of red tile laid in cement alternately with pieces of stone of similar size, and is in an excellent state of preservation.

Mr. Pisa Bennett, the owner of some tenements over stables in Salisbury-street, Bermondsey, was summoned by the Vestry to the Southwark Police-court on Friday, to say why the premises in question should not be closed. The magistrate said he had been to see these tenements, and their condition was horrible. He fined the defendant £10, directed the immediate closing of the dwellings, and granted 10s. to each tenant as compensation for the eviction.

The last block of property required for the widening of High-street, Sheffield, is being rapidly demolished, and the importance of the improvement effected is being realised. At the same time, the corporation are coming in for some adverse criticism. With a main central thoroughfare 80ft. wide, it was thought that only commanding lofty buildings would be allowed to be erected in it. No such provision seems to have been made, and accordingly at one end there is a fine block of buildings, then comes a terracotta front, then a two-story building, followed by a flimsy structure of iron and glass.

Mr. James Green (Messrs. Weatherall and Green) has been appointed sole arbitrator to adjudge the amount to be paid by the London County Council for the acquisition of the various depots, stabling, and premises on the North Metropolitan and London Street Tramways Company. The inquiry will be held early in March.

The will of the late Mr. John William Gray, who died on August 14, late engineer to the Water Department, of Linden, Kenilworth-road, Leamington, has been proved at Birmingham. The personal estate was valued at £9,919, and there was also real estate.

At the annual meeting of the shareholders in the Royal Albert Hall, held on Monday, Lord Lathom, the chairman, announced that Her Majesty's Commissioners for the Exhibition of 1851 had undertaken to carry out the necessary works for the completion of the south approach to the hall.

The railway station at Lisburn is about to be rebuilt, at a cost of £7,000. The contract has been taken by Mr. David MacHenry.

The public testimonial to Mr. John Finnie, who for so many years filled the post of headmaster at the Liverpool School of Art, has taken the form of a purse of gold and an illuminated address. The presentation will be made to-morrow (Saturday) evening, after the annual distribution of prizes and certificates to the students.

Messrs. F. Braby and Co., Ltd., have opened a branch office at Ashton Gate Works, Coronation-road, Bristol, and will commence business there on March 1.

The foundation-stone of a Masonic temple being erected at the junction of West Stewart-street and Argyll-street, Greenock, at a cost of £4,000, for the use of the members of the Greenock Lodge St. John's, was laid recently, with Masonic honours.

## Engineering Notes.

NOTTINGHAM.—MESSRS. Nowell and Son, of Westminster, who have a contract for a line connecting the Great Northern's Nottingham and Grantham section with a viaduct of the Manchester, Sheffield, and Lincolnshire Railway at Middle Hill, Nottingham, are making good progress with the works. The new line is being carried out under the superintendence of Mr. W. H. Sadler, resident engineer of the Great Northern Company, Mr. R. Johnson, of King's Cross, acting as engineer-in-chief. The connection between the two systems will be effected by a viaduct, which will have to be constructed upon a sharp curve. The Great Northern Company now desires to divert its Grantham line, so as to run alongside the North-Western goods line and its own canal, and through Sneinton Hermitage, leaving the existing goods yard undisturbed. The alteration is made with the approval of the Nottingham borough engineer. The viaduct will be erected on cylinders, which are to be carried down by the pneumatic process to solid rock. The canal and London-road will be crossed by a steel bridge, some of the girders of which are to have a span of 150ft. The new London-road station is to be built on the top of the viaduct at this point.

## CHIPS.

The annual dinner of the Builders' Clerks' Benevolent Institution will be held at the Holborn Restaurant on Tuesday, April 6, the president, Mr. Thomas Hall, of Messrs. Hall, Beddall, and Co., in the chair.

Estate duty has been paid on £116,863 14s. 6d. as the net value of the personal estate of Mr. David Brandon, F.R.I.B.A., of 24, Berkeley-square, who died on the 10th of January last, aged 83 years. Mr. Brandon bequeathed to the Royal Institute of British Architects (of which he was at the time of his death the senior member) and to the Artists' General Benevolent Institution £1,000 each, and has left smaller sums to numerous hospitals and other charities.

Princess Henry of Battenberg has promised to lay the foundation-stone, in July, of a new block of buildings, to be added to the Royal National Hospital for Consumption at Ventnor. The block will contain three houses, and will cost about £6,000.

The Mayor of Southend-on-Sea has offered, and the offer has been accepted by the town council, to present to the town a marble statue of Queen Victoria, in commemoration of the sixtieth anniversary of her Majesty's accession. The statue is to be placed upon the Royal Hill. The figure is to be of white Serranerra marble, and will represent the Queen seated in a chair of state in the proportions of a figure which, if standing erect, would be 8ft. high; it will be placed on a pedestal 10ft. high, of white Carrara marble. The design and execution have been intrusted to Mr. J. M. Swynerton.

At a meeting of the Bandon Board of Guardians, a letter was read from the Local Government Board authorising the issue to the guardians of a loan of £6,555 in connection with a new scheme of labourers' cottages.

The engineer to the New River Company has deposited in the Private Bill Office of the House of Commons an estimate amounting to £970,000 as the capital required for proposed new works—viz., giving the company an independent line of pipes for the purpose of conveying the proportion of stored water to which they will become entitled under the Staines Reservoirs Act of last year into a new service reservoir at Fortis Green and thence into their limits of supply.

Mr. Balfour is sitting for his portrait to Mr. Lockhart, R.S.A., at the request of Mr. Cameron Corbett, M.P., who is going to present it to the Glasgow Art Galleries.

The large Decorated and Perpendicular parish church of Chesterfield, celebrated for its twisted lead-covered steeple, is about to be restored from plans by Mr. Temple Moore, whose estimate for the entire work necessary amounts to £15,000. The contract for the first section has, however, been let at about £2,000, and it is expected that eight or ten years will be occupied in gradually repairing the external masonry of the church.

A valuable gift has been made by the directors of the Great Western Railway Company to the Railway Museum, South Kensington, namely, the company's first locomotive engine, the celebrated "North Star," which was designed and constructed by R. Stephenson and Co. in 1837. This engine was built for America, and actually was sent to New York; but being returned, was altered for the Great Western line, and then ran 429,000 miles.

Plans have been prepared by Mr. W. Hattrell (Messrs. Hattrell and Harrison), of Coventry, for the erection of a Wesleyan chapel on a site adjoining the present building at the corner of Stoney Stanton-road and Eagle-street, in that city. The new edifice will accommodate 550 adults, and underneath will be the Sunday-schools. The cost will be about £3,500.

Old Trinity Presbyterian Church, in New Bridge-street, Newcastle-on-Tyne, is at present being dismantled preparatory to the erection on the site of shops, offices, and warehouses. The building was erected in 1846, and has been replaced by a new and larger structure in Northumberland-road, Newcastle, opened on May 24, 1896.

The engineers to the North-Eastern Railway Company have deposited in the House of Commons estimates of the capital required in the event of Parliamentary sanction being given to the works contained in their Bill. The estimated cost of the works is £1,467,676, of which £781,712 will be laid out upon the new dock at Hull, and £385,057 on the enlargement of the existing dock at Middlesbrough. The cost of the new railways and widenings is put down at £185,360, of which £172,890 will be expended upon railway widenings and extensions in Durham, £3,650 upon a railway at Thornaby, £18,820 upon the construction of a junction between the Leeds and Wetherby Railway and the company's Church Fenton and Harrogate Railway, and £52,278 upon a widening of the Leeds and Wetherby Railway for 10½ miles.

Messrs. Kynoch and Co., of Birmingham, have acquired the Borley House Estate, Corringham, Essex, having a frontage of a mile to Thames Haven, and, under a licence from the Secretary of State, which was approved by the Justices at Grays last week, they propose to erect factories there for the manufacture of sporting and military ammunition. Between 200 and 300 persons will be engaged in the new works in nine months' time, and the factories will eventually find employment for thousands of hands. It was stated by the solicitor who applied to the Grays bench of magistrates for a license that the company propose to erect forthwith a thousand houses at Corringham.

The Hants County Council have elected, from among 194 candidates, Mr. W. A. Taylor as county surveyor in succession to the late Mr. Robinson, C.E. Mr. Taylor, who is 33 years of age, was articulated to Mr. Lemon, of Southampton, and has been for the past seven years chief assistant to Mr. Robinson. Mr. J. A. Bean, deputy county surveyor of the West Riding, was second among the selected candidates.

A new theatre of wood was opened in Wolfe-street, Stoke-on-Trent, last week. It has been erected from designs by Mr. Charles Lynam, F.S.A., of Stoke, and consists of a stage with ground and first-floor dressing-rooms, orchestra, auditorium, comprising stalls, pit on the ground floor; on the first floor, four boxes, circle, back circle, and gallery. Between the ground floor and the floor of the back circle are a refreshment-bar and office. The seating accommodation on the ground floor will be for 700, and on the first floor 400, altogether 1,100. The stage has a separate entrance and exit. Lighting is to be partly by the electric light and partly by gas.

The restoration works at East Sutton Church, Kent, which have been in progress about two years, are now approaching completion. The undertaking has been carried out by Messrs. J. Wood and Son, of Boughton Monchelsea.

Cornell University, which for some years has had the finest archaeological museum of any American university, has had added to it a collection of rare specimens of ancient Greek pottery, showing the development of the art from the beginning, about 1500 B.C., to its perfection, about 450 B.C. These were purchased for the university by Prof. B. I. Wheeler while in charge of the American School at Athens last year.

The plans and works committee of the Edinburgh Town Council have resolved to recommend that sprays be introduced into the public baths at Infirmary-street and Dalry, from designs by Councilor Douglas.

The marble bust of Dr. Rendall, Principal of University College, Liverpool, executed by Mr. Charles Waller, of that city, was on Saturday presented to the college by a large number of subscribers. The gift was acknowledged by Lord Derby, president of the college.

Application having been made by the corporation of Chatham to the Local Government Board for permission to borrow the sum of £20,000 for the erection of a town hall at Chatham upon a site already acquired by the town council, an inquiry upon the subject has been held at the corporation offices, Military-road, by Colonel W. L. Toke, M.Inst.C.E. Mr. George E. Bond, M.S.A., of Rochester, the architect, exhibited the plans and design of the building, as illustrated in our issue of December 4, 1896.



## LEGAL INTELLIGENCE.

**BUILDING DISPUTE BETWEEN LEEDS BANKS.**—Mr. Justice North, on Saturday, in the Chancery Division of the High Court of Justice, resumed the hearing of the motion by the London and Midland Banking Company for a mandatory injunction to compel the defendants (the National Provincial Bank) to pull down part of their new building in Park-row, Leeds, alleged to have been erected in breach of an undertaking, or, in the alternative, for a writ of sequestration against the defendant company. At the conclusion of the respondents' case, his Lordship intimated that his then view was that the motion should be dismissed, without costs. Mr. Swinfen Eady, Q.C., for the plaintiffs, could not agree to that. His contention was that some twenty courses of brick had been added to the building since the undertaking, and the usual course the Court took in such cases was to order anything erected in breach of an undertaking to be at once pulled down. Mr. Justice North said he would not order the defendants now to pull down, nor would he issue a writ of sequestration against them; but he thought they had been in the wrong, and must therefore pay the costs of the motion. He granted an injunction until the trial restraining the defendants from increasing the height of their building.

**ANCIENT LIGHTS APPEAL.**—CHASTEY AND ANOTHER v. ACKLAND.—In the House of Lords, on Monday, the Lord Chancellor, Lord Herschell, Lord Macnaghten, Lord Morris, and Lord Shand heard an appeal from a decision of the Court of Appeal reversing an order of Mr. Justice Cave, made at the Exeter Assizes after trial before the learned Judge without a jury, and it raised the question whether the owner of premises is entitled to protection, not only in respect of his ancient lights, but also of a free circulation of air over and through such premises. The appellants were the owners and occupiers of freehold premises in Exeter and carried on business therein as lodging-house keepers, and the respondent was the owner and occupier of adjoining premises in which he carried on the business of a dentist. The appellants brought the present action against the respondent for a mandatory injunction and for damages in respect of the alleged obstruction of the appellants' ancient lights and of the free access of air to their premises, by reason of certain alterations which the respondent had made in his premises. At the trial the learned Judge found the following facts proved—namely, that there had been an interference with the appellants' ancient lights, the damage in respect of which was assessed at £10; that the effect of the respondent's new building was to make the basement of the appellants' premises damper and their rooms less wholesome, to cause smells in their house, and by checking the draught of the fires to make the chimneys smoke, and to seriously and prejudicially affect the ventilation of their house and so to cause them pecuniary damage. The learned Judge thereupon gave judgment for the appellants and granted an injunction, ordering the respondent to pull down a portion of the new building he had erected, being of opinion that such new building constituted a nuisance to the appellants' premises by interfering with the ventilation which they had previously enjoyed, by making the basement damp and the rooms stuffy and uncomfortable to live in. The respondent having applied to the Court of Appeal that the judgment should be entered in his favour as far as the order for the pulling down of the new building was concerned, the case was heard before Lord Justice Lopes, Lord Justice Kay, and Lord Justice Lindley, who reversed the decision of Mr. Justice Cave, on the ground that although the want of ventilation and the absence of the means of carrying off the bad smells on the appellants' premises had probably been aggravated by the respondent's new building, yet that nothing deleterious, nothing hurtful, and nothing disagreeable had been brought upon the appellants' premises by anything that the respondent had done. Their Lordships also held that if a nuisance existed on the appellants' premises it was not created by the respondent, and that the appellants had no legal right to a free passage of air which would remove disagreeable smells created upon their own premises. They further held that if the appellants had been inconvenienced by anything the respondent had done, it was *damnum absque injuria*, and afforded no legal ground of complaint. The appellants now sought to have the decision of the Court of Appeal reversed, and that of Mr. Justice Cave restored. After the case had been fully argued, it was suggested by their lordships that the matter in dispute was one that might be settled by arrangement. Lord Herschell said that if the parties had nearly arrived at an agreement he should be willing to act as arbitrator between them. Eventually it was agreed between the parties that the appeal should be withdrawn on the terms that the £10 damages awarded to the appellants on their claim for the obstruction of their ancient lights should be increased to £300, and that the respondent should pay the appellants' costs in that House and in the Court below, and

that even if it were decided that they had a legal right to require the respondent's new building to be pulled down in respect of the loss of the free circulation of air they should not enforce such right.

**THE FRONTAGE DISPUTE AT STOKE NEWINGTON.**—The work undertaken by the London County Council in carrying out the order of Mr. Lane, police magistrate, for the demolition of 7ft. of a new building at the opening of Prince George-road from Stoke Newington-road, was completed on Monday. The building had been erected 7ft. beyond the building line, as defined by the superintending architect of the London County Council, and after the foundations had been put in the Council summoned the builder to the North London Police-court; but the magistrate upheld the builder. Notice of appeal was given and the case was ultimately decided in favour of the Council. In the meantime, however, the building had been completed and fitted up. The case was remitted from the High Court, and Mr. Lane ordered the demolition of so much of the building as stood out beyond the building line—roughly speaking, 150ft. frontage by 7ft. in depth. The order was served on the builder, but though the Council allowed the matter to rest for 12 months, he made no move, and the Council undertook to do the work themselves. The 7ft. has now been cleanly cut off from end to end. Rafters and iron girders have been cut exactly to the building line. The depth of the structure is now only 13ft., and it is said to be entirely useless for any purpose. It has been shored up, but one side of the whole length is open.

**LONDON BUILDING ACT APPEAL.**—WEBSTER v. LONDON COUNTY COUNCIL.—This case has just been decided by the Tribunal of Appeal. Mrs. A. E. Webster, the owner of land upon which a retaining wall had been built inclosing a yard and stables at Pearson's-avenue, Deptford, applied to the Council for consent to the erection. The Building Act Committee refused to consider the application, and the appeal was lodged. Mr. Berry, for the Council, relied entirely on a technical objection to the appeal. After hearing the arguments by Mr. Drake (for the appellant) and Mr. Berry, Mr. A. A. Hudson, barrister-at-law and a member of the Tribunal, as well as the chairman, made some strong observations as to the misleading way in which the Council had conducted the business in this case. In the end the Chairman said the Tribunal had no alternative but to dismiss the appeal. They had seen the place and given the matter a great deal of care and attention, and thought it a great pity that the Council should take such a highly technical point, as it was a case of wide range which they thought should have come to the Tribunal on its merits. The advisers of the Council had differentiated between the Council and the Building Act Committee, and the officials had put the application before the Building Act Committee and not the Council direct. He could only express the regret of the Tribunal, who made no order as to costs.

## CHIPS.

The Tyne Commissioners have decided to ask Mr. Wolfe Barry, C.B., the president of the Institution of Civil Engineers, to recommend an engineer to advise them as to the repair of Tynemouth Pier.

The annual dinner of the members and friends of the Derby Branch of the National Association of Master Painters and Decorators was held at the Royal Hotel, Derby, on Tuesday week, Councillor J. H. Ottewell presiding. Amongst those present were Councillor Smith, of Sheffield (president of the National Association); Messrs. A. G. Sutherland, of Manchester (secretary); Thos. Preston, of Burnley (treasurer); J. Cantrill, of Manchester; G. Gascoyne, of Nottingham; and Ratcliffe, of Bolton.

In commemoration of the completion of the Queen's 60 years' reign it has been decided to make a considerable extension to the University College Hospital. Mr. Alfred Waterhouse, R.A., has prepared plans for alterations which will constitute the hospital into a block bounded by four streets—Gower-street, Grafton-street, Huntley-street, and University-street—and will be arranged in the shape of a cross bounded by each of the four corners. The cost will be not less than £100,000, entirely borne by Sir Blundell Maple, M.P.

A meeting of the creditors of Mr. T. P. Jones, builder and contractor, Llanelly, was held last week, the Official Receiver presiding, and adjourned for a fortnight. The statement drawn up by the Official Receiver showed that the debtor's liabilities were £4,335 13s. 2d., the assets £2,351 8s. 8d., leaving a deficiency of £1,984 4s. 6d.

A new schoolroom to accommodate 59 infants has been added to the existing school premises at Wellington, for the School Board, and was opened last week. The work has been carried out by Mr. Wm. James, builder, Bromyard, from the plans and under the superintendence of Mr. Ernest G. Davies, M.S.A., architect, of Hereford.

At a meeting of the Royal Scottish Society of Painters in Water Colours, held in the Balmoral Hotel, Edinburgh, on Friday, Sir Francis Powell, R.W.S., in the chair, the annual election of the society took place. There were 14 candidates who submitted works, and as a result two were elected—Miss Katherine Cameron and Mr. James Kay. Sir E. J. Poynter, P.R.A., and Mr. B. J. Blommers were elected honorary members of the society.

Direct communication by tramcar from the centre of Leeds to Roundhay Park has just been completed by the laying of a double track of tram-lines from the old terminus near Roundhay Post Office to the Canal-gardens. The line will be worked by electricity, and the initial trip took place on Monday. The work has been done for the corporation under the supervision of Mr. T. A. Prince, at a cost of £10,000.

The committee appointed to select a sculptor for the statue of the Queen to be erected in Dundee have decided to offer the commission to Mr. Harry Bates, A.R.A., London. The cost, including the pedestal, was stated at £2,500. The statue is to be of bronze, on a granite pedestal. Her Majesty will be represented in a sitting posture, and the site selected for the statue is opposite the Albert Institute buildings.

The City Commissioners of Sewers resolved on Friday to take over and maintain in perpetuity the statue of the Queen recently erected at the eastern end of the Victoria Embankment, to construct underground lavatories in Thames-street, near London Bridge, at a cost of £4,000, and to repave Mincing-lane, Abchurch-lane, Clements-lane, Aldermanbury, Long-lane, and Philip-lane with asphalt at a cost of £3,630.

Business continues very active at the Estate Mart, although the supply still falls short of the requirements of investors. The aggregate realisation this week is £91,787, as compared with £73,318 in the corresponding week of last year, a result which places 1897 still further in advance of its predecessor. So far as can be judged, the prospects of the season are very favourable.

We learn that Mr. Philip E. Pilditch (Messrs. Pilditch, Chadwick, and Co.), architect, surveyor, and valuer, has, in consequence of the projected demolition by the Government of Parliament-street, where the firm has practised for the past twenty years, removed to more centrally-situated and convenient premises at No. 2, Pall Mall East, Charing Cross, at the corner of the Haymarket and Pall Mall, and adjoining Barclay's Bank.

The new board schools, Shrewsbury, are being warmed and ventilated by means of Shorland's patent Manchester grates and patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The jubilee of the consecration of St. Luke's Church, Reddall Hill, Cradley Heath, was celebrated on Sunday by the unveiling of a stained-glass window representing the Good Samaritan, which has been placed on the north side in memory of the late Dr. Thomas Standish. The window was designed and erected by Messrs. O. C. Hawkes and Co. (Limited), of Birmingham.

Mr. Charles F. Wentworth, of the firm of Cram, Wentworth, and Goodhue, architects, of Boston, Mass., died on February 8th at Coronado Beach, Cal., where he had gone on account of his health. He was a native of Boston, and his entire professional life had been spent in partnership with Mr. R. A. Cram.

Yesterday (Thursday) the Bishop of Chester (Dr. Jayne) consecrated the new parish church of St. George, Heaviley, Stockport. The church has been erected at a cost of some £40,000 by the Christy family.

In the case of W. R. C. Waters, architect and surveyor, whose present address is unknown, a discharge from bankruptcy has been granted.

The works of the late Richard Beavis, R.W.S., of Campden Hill-square, were sold by auction at Christie's between Wednesday and Saturday of last week, and reached in all £1,849.

In connection with the opening of the Royal Scottish Academy, the Scottish Arts Club gave a reception and musical evening on Friday in their rooms, Rutland-square, Edinburgh. Professor Baldwin Brown, president of the club, received the guests, and there was a brilliant and crowded gathering of ladies and gentlemen present.

A company has been formed in Worthing for the conversion of the existing Assembly Rooms into a theatre more in keeping with the requirements of the town. A handsome front will be erected to Bath-place, and a new proscenium, dress-circle, and stage will be built. A large hall will also be erected in connection with the theatre, available for dances, banquets, &c. The work, which will be of an extensive character, will be carried out from plans prepared by Mr. Alfred T. Cooke, architect, of Worthing.



## Our Office Table.

THE Lord Mayor has kindly promised to open the Building Trades' Exhibition at the Agricultural Hall, Islington, on Saturday, March 20, at 12 noon. His lordship's visit will be in full state, and it is probable he will be accompanied by the sheriffs and other civic dignitaries. The building trades of the Metropolis and the exhibitors generally will be gratified by this kindly manifestation of good feeling by the chief magistrate of the Metropolis, and we congratulate Mr. H. Greville Montgomery on the additional recognition of his efforts to make the Exhibition really worthy of the great industries it represents.

It is satisfactory to learn that under the will of the late Lady Wallace, the whole of the collections at Hertford House, Manchester-square, so far as they are contained on the ground floor, the first floor, and the galleries, have been bequeathed to the British nation, on condition that the Government shall provide a site in some central part of London and build a museum to contain the collections, which are to be kept together and styled the "Wallace Collection." The collection, which was valued for probate at over a million sterling, is the finest private one in the world. It is especially rich in modern French and the old Dutch works. Of the former there were 349 oil paintings and drawings, of which two are by Claude, 11 by Watteau, nine by Lancret, 15 by Pater, 11 by Boucher, 22 by Greuze, five by Nattier, 15 by Delaroche, four by Troyon, 34 by Decamps, 15 by Meissonier. There are also 169 Dutch paintings—eleven by Rembrandt, one by Hals, 11 by Cuyp, six by Metz, two by Terburg, two by De Hooch, four by Ruysdael, five by Hobbema. The English works include examples of Gainsborough, Lawrence, Reynolds (13), Romney, Wilkie, and Hopner; among Spanish works there are 11 by Marillo and eight by Velasquez, and, of the Flemish artists, Rubens is represented by 11 works, Van Dyck by six, and Teniers by five.

In a letter to the *Times* on the completion of South Kensington Museum, Mr. Aston Webb, the author of the selected design, says that he considers that a large amount of inside decoration would be quite out of place in such a building. The report which accompanied his design explained that the walls of the courts and galleries had been purposely left without architectural embellishment, being arranged solely with the view of placing objects upon them, decoration being confined to the entrance-hall and staircase. After Mr. Webb's formal appointment as architect in 1891, the internal planning of the building was very carefully considered in conference, both with the Office of Works and the Museum authorities, and he was further considering the exterior design when the drawings were stopped, and he has since been anxiously awaiting instructions to proceed. Mr. Webb adds "That the best architecture for a museum is that which interferes least with the objects shown, and that good lighting and planning should be the leading considerations for such a building is perfectly true, but beyond this it is the duty of the architect to remember that he is intrusted with the erection of a great national building to shelter some of the nation's greatest art treasures, and that he would not be properly fulfilling his duty by the provision of a mere utilitarian structure."

THE annual dinner of the members of the Surveyors' Institution was held at the Hotel Cecil, Strand, on Wednesday night. Mr. Daniel Watney, the president, occupied the chair, and the company numbered about 200. After the loyal toasts, the president proposed "The Houses of Lords and Commons." Mr. Jesse Collins, M.P., replied. The toast of "The Bench and the Bar," proposed by Mr. C. Oakley, was acknowledged by Mr. Justice Grantham and Mr. E. J. Castle, Q.C. Mr. G. de L. Willis proposed the toast of the evening—"The Surveyors' Institution." He said the institution was established in the year 1869, and incorporated by Royal Charter in 1881. The institution, which was a public authority under the London Building Act, 1894, and other statutes, was now erecting at a cost of £30,000 a handsome building in Great George-street for a permanent home. He stated, in conclusion, that the president had provided an endowment of £10 per annum for the best work in the science and practice of forestry. The president responded. Professor Aitchison,

A.R.A., the president of the Royal Institute of British Architects, and Mr. N. C. Macnamara, the vice-president of the Royal College of Surgeons, responded for the toast of "The Kindred Societies," proposed by Mr. C. J. Shoppee. Other toasts followed.

THE Carpenters' Company, who are coming prominently to the front in technical education, have just issued their new programme of the annual course of free weekly lectures on architectural and building subjects, to be given at their hall in London-wall. The first of the course was delivered on Wednesday evening last by Professor T. Roger Smith, F.R.I.B.A., who took as his subject, "Our Ancient Cathedrals," illustrating it with numerous lantern views and designs. The chair was occupied by Professor Aitchison, A.R.A., P.R.I.B.A. Next Wednesday, at 8 p.m., Professor J. A. Fleming, F.R.S., will lecture on "The Work of the Electric Current," when Lord Roay has promised to preside; and the other fixtures are, for March 10, "Is a National 20th-Century Style of Architecture Probable?" by Professor Banister Fletcher; March 17, "The Chemistry of Certain Metals Used in Building Construction," by Professor J. M. Thompson, F.R.S.E.; and March 24, "Practical Plumbers' Work," by Mr. J. Wright Clarke.

THE General Purposes Committee of the London County Council reported on Tuesday on the course of action which the Council should adopt in the case of the contemplated destruction of any building of historic or architectural interest. In their opinion a list, as complete as possible, should be obtained of all such buildings in London. They appointed a sub-committee to deal with the matter, and a conference was arranged with various institutions and societies. The conference passed resolutions to the effect that it was desirable to make such a list in a form to permit of amplification as information came to hand, and to appoint a general committee, to include representatives of the different societies interested in the matter, with representatives of the Council. The conference also resolved that the General Purposes Committee should consider the desirability of printing the register from time to time with suitable drawings and illustrations. It was also agreed that the existing committee for the Survey and Registration of the Old Memorials of Greater London, having already made a register of buildings in the East-end of London, should be requested to continue its work, and that it was desirable that similar registers should be compiled for the rest of London, it being understood that the registers so compiled should be for the use of the London County Council. The committee have, since the conference, considered these resolutions, and are of opinion that they should be adopted. They have given directions for a circular to be sent out to members of the Council, asking them to assist in the collection of particulars for a register of the nature suggested.

ACCORDING to recent experiments at Sutton and other places, the usual "settling tanks" of sewage treatment processes will soon be converted into bacterial beds. The experiments made by Mr. W. J. Dibdin, chemist of the London County Council, have been so far successful, according to one journal, that the Sutton Urban Council have allowed that gentleman to make experiments in a settling tank, and a complete system of under drainage was laid down, and water containing the organisms *micrococcus candidans* was pumped upon a specially-prepared bed, which received the raw sewage. No chemicals were used, but the sewage was left to be operated on by the bacteria for a couple of hours. It is stated that the effluent obtained after these organisms had done their work was much clearer than that which comes from the settling tanks, and might be turned into the stream without fear of consequences, but it is to be further pumped by passing through filters or over the land. We shall await the result of this important new departure in sewage treatment.

THE ninth of the series of fortnightly lectures in Glasgow Corporation Art Galleries was delivered on Saturday evening by Professor F. M. Simpson, of University College, Liverpool, whose subject was "The History of the Arch." Professor Simpson said that, although the lintel form of construction was older than the arch form, the latter was more ancient than was generally supposed. It was known to, and used by, the Egyptians 3,000 years before the birth of Christ.

The most interesting discovery had been that of the gates of Khorsabad, in Assyria, which dated from 721 B.C. Both the pointed and semi-circular headed forms were used by the ancients, although the former shape was generally not constructed with radiating voussoirs, but with stones projecting one in front of the other, the joints being horizontal. The godfathers of the arch were really the Etruscans. From them the Romans learned it, and used it universally in their buildings. All the Roman arches were semi-circular, and were constructed on true arch principles. So were the arches used by the Byzantine and Romanesque builders. The pointed form reappeared in the Saracenic work of the 9th or 10th century, and was adopted by the Medieval architects to solve certain difficulties in construction, principally those of vaulting over oblong spaces. It was constructed properly with radiating voussoirs, but the old idea that the Gothic men invented the pointed arch was a mistake. At the end of the 14th century the arch became again semi-circular, and this continued until the Gothic revival at the end of the last century once more brought the pointed form into fashion.

THE excavations which have been carried out at the Plemmyrium promontory, near Syracuse, during the past fortnight, under the direction of the Conservator of Monuments, the Chevalier Reina, have led to the discovery of the foundations of a colossal angle tower, which is believed to date from the Greek epoch. These foundations consist of enormous blocks of marble and Egyptian granite, which are closely joined together. Portions of columns, which evidently used to surround the main building, have also been found. These also were constructed of solid blocks of marble and granite. Excavations to isolate completely the Ara near the Greek Theatre have also been resumed, and have resulted in the discovery of a bronze statuette, various vases, lamps, and coins.

### CHIPS.

New Roman Catholic day-schools for the parish of St. Augustine, which have been erected at a cost of over £6,000 in Stone-street and William-street, off Great Howard-street, Liverpool, were opened on Sunday. The schools will provide accommodation for 750 scholars. They have been built from the designs of Mr. M'Cann, of Malvern, the contractors being Messrs. Hughes and Stirling, of Bootle.

New York city has fewer churches in proportion to its population than any other large city in the United States. New York has one church for every 2,837 people, Chicago one for every 2,199, Brooklyn one for every 2,105, Philadelphia one for every 1,576.

The proposed widening of Renshaw-street, Liverpool, formed the subject of a Local Government Board inquiry at the Liverpool Town Hall on Monday, when evidence in favour of and in opposition to the scheme was adduced.

The Edinburgh Town Council received and adopted on Tuesday a report by the Lord Provost's Committee recommending approval of elevation plans of buildings to be erected on both sides of North Bridge-street, by the authors of the design adjudged first (Messrs. Scott and Williamson), and failing satisfactory offers from outside parties, recommending that the corporation should undertake the work of reconstruction, and craving a remit to instruct the preparation of working plans for the corner blocks; meantime, to obtain estimates for the work, and report.

The Isle of Man Tramways and Electric Power Company, owners of the Douglas Bay, Laxey, and Snaefell Mountain Tramways, are applying to the Tynwald Court for a Bill to empower them to extend their electric system from their Laxey terminus to Ramsey. The new line will mean a large accession of traffic to the company, which has paid 7½ per cent. on existing electric lines.

After much vexatious delay, owing to the formalities to be observed in the different departments in the War and the Woods and Forests Offices respectively, the Scarborough Corporation have received permission to proceed forthwith to construct the proposed drive and sea-wall round the Castle Hill to form the connecting link between the two foreshore roads. Messrs. B. Cooke and Co., of Battersea, the contractors for the work, will send down a representative immediately to direct the commencement of active operations. The amount of the contract is £69,270, and as the corporation has only borrowing powers for £70,000, they are asking for the sanction of the Local Government Board to their borrowing a further £10,000 for contingencies. The town has already, by poll, assented to the extra loan.



## MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Edinburgh Architectural Association. Visit to North British Brewery, Gorgie-road. 3 p.m.

MONDAY.—Royal Institute of British Architects. Business Meeting. 8 p.m.

Society of Engineers. "Proposed By-Laws of the L.C.C. with respect to House Drainage," by J. P. Barber. 7.30 p.m.

Society of Arts. "The Industrial Uses of Cellulose," Cantor Lecture No. 3, by C. F. Cross. 8 p.m.

Liverpool Architectural Society. Address by W. E. Willink, A.R.I.B.A.

TUESDAY.—Institution of Civil Engineers. 8 p.m.

WEDNESDAY.—Carpenters' Hall Free Lectures. "The Work of the Electric Current," by Professor J. A. Fleming, F.R.S. 8 p.m.

Society of Arts. "English Orchards," by George Gordon. 8 p.m.

Edinburgh Architectural Association. "The Practical Designing of Iron and Steel Roofing," by Alex. Drew. Royal Institution. 8 p.m.

Edinburgh Architectural Society. "Artistic Work and Influence of the late William Morris," by R. S. Lorimer, A.R.I.B.A. Dowell's Rooms. 8 p.m.

THURSDAY.—Society of Arts. "The Mechanical Production of Cold," Howard Lecture No. 6, by Professor James A. Ewing, F.R.S. 8 p.m.

FRIDAY.—Architectural Association. "Greek Sculpture and Greek Legend," by F. S. Granger, D.Litt.Lond. 7.30 p.m.

## CHIPS.

Mr. H. H. Bridgman, F.R.I.B.A., had to undergo another serious internal operation on Sunday week; but we are glad to learn that he is progressing favourably towards recovery.

Permission to excavate the site of old Corinth, between the Acrocorinthus and the modern city, has been granted to the American School at Athens by the Greek Government.

The Walsall Town Council have resolved to purchase a piece of land at the bottom end of Lichfield-street, between the County Court and the public baths, as the site of municipal offices at some future time. The council have deferred for twelve months a decision as to what should be done with the land in Park-street and the competitive plans for the proposed town hall on that site.

The new town hall for Rotherhithe will be opened about the end of March. Mr. Howell J. Williams, of Bermondsey, is the builder, and Messrs. Murray and Foster, of John-street, Adelphi, are the architects of the building, which is Free Renaissance in style, is faced with Portland stone and red brick, and has cost about £15,000. We illustrated the town hall by double-page perspective in our issue of September 20, 1895.

The annual exhibition in connection with the Border Master Painters' Association was held at Kelso on Friday and Saturday, the judges being Messrs. James Clark, Edinburgh; Charles Carlton, Glasgow; and J. W. Thomson, Leith. The prizes were offered for plain and ornamental panels, plain and ornamental lettering and figuring, relief decorations, &c. The principal prize-winners were:—Apprentices—J. Mackison, Galashiels (first year); A. G. Lindsay, Galashiels (second year); Alex. Lauder, Galashiels (third year); Adam Armstrong, Galashiels, and E. Vannan, Galashiels (fourth year); John Brownlie, Galashiels (fifth year); John Wood, Galashiels, and W. Wilson, Galashiels (sixth year). Journeymen—D. Hope, Galashiels; W. Laurie, Peebles; and Philip Dodds, Galashiels. At the annual meeting it was agreed to affiliate with the National Association.

Both the Lady Windsor deep dock at Barry Dock and the Vale of Glenmorgan Railway will be formally opened for traffic in June. The contractor for the dock is Sir J. Jackson, while the contractors for the railway are Messrs. Pethick Brothers. Messrs. Price and Wills, the contractors of the new dock of the Barry Graving Dock and Engineering Company, Limited, have put a large staff of men on the works this week, and the contract is being pushed forward with all practicable expedition.

A meeting of the parishioners of St. John's, Ipswich, was held last week in the schoolroom, Cauldwell Hall-road, to consider what steps should be taken to provide more church accommodation for the rapidly-growing working-class district. The present church was opened on Feb. 19, 1857, just forty years ago, and, as enlarged twelve years later, only seats 380 persons, whereas the parish has a population of 5,000. Sir Arthur Blomfield, A.R.A., has been consulted as to the possibility of enlarging the structure; but reported that a satisfactory reconstruction would cost from £6,000 to £7,000, whereas a new building to seat 800 could be erected for £8,000. The meeting decided to take steps to build a church on adjoining land, the present building to be utilised as a parish-room. Towards the £6,000 required for the first section, about £1,200 has been promised.

## Trade News.

## WAGES MOVEMENTS.

GLASGOW.—Wages in the building trade in Glasgow are regarded as very good at present. Masons, bricklayers, and joiners are being paid at the rate of 9d. an hour, with ½d. an hour extra when the men are engaged in outlying districts. The joiners, however, have sent in an application for ½d. an hour advance, and the plumbers, who have been in receipt of 8½d. an hour, are pressing for an increase of 1d. per hour. The demands will be discussed shortly at a joint conference.

KILMARNOCK.—At a meeting of the operative joiners of Kilmarnock on Tuesday night, a communication was received from the Masters' Association, intimating that they could not agree to a series of by-laws with regard to working hours, wages, &c., which the men had drawn up and submitted to their employers for approval. The men accordingly resolved that unless the masters accepted these by-laws by Saturday (to-morrow), they would not resume work on Monday.

TAMWORTH.—The plumbers, bricklayers, carpenters, painters, and bricklayers' labourers of Tamworth and the district have all made a demand on the employers for an increase in wages. The plumbers ask for an advance of 1d. per hour, and the others ½d. per hour.

Of the 29 stone figures required for filling in the niches of the west front of Beverley Minster, 18 have already been promised.

Mr. Joseph Chamberlain, who for several years represented Stapenhill and Winhill Ward on the Burton-on-Trent Town Council, died at his residence at Stapenhill, on Sunday morning, at the age of 58. He was formerly in business at Barton as a builder, and carried out some large contracts, including the building of the Market Hall.

The Light Railway Commissioners held an inquiry at the Crewe Arms Hotel, Crewe, on Wednesday week, as to an application by the British Electrical Traction Co. for powers to construct and work electric tramways in the main streets of the borough of Crewe, and from Crewe to Haslington Church. Mr. Stephen Sellon, the engineer to the promoters (the British Electric Traction Co.) said he had prepared the plans of the scheme. He described the various lines proposed to be constructed. The total length of the tramways in the borough and outside was seven miles six furlongs and seven chains, and the estimated cost about £50,000. The lines will be worked by electricity. The commissioners estimated that, subject to certain conditions, consent to the scheme will be granted.

In connection with the Highgate Archway improvement, the improvements committee reported to the London County Council, on Tuesday, that they had had several designs before them for the new structure, with the result that they had selected one for a single arch bridge of 120ft. span, with steel ribs. In December last the Council adopted estimates amounting to £28,100, for the work. Having regard to the nature of the undertaking, the committee believed that the Works Department would desire the Council to order it to be carried out by a contractor, and the committee advised the Council accordingly. The report was adopted.

An inquiry was held on Friday at the Town Hall, Newcastle-under-Lyme, by the Earl of Jersey (chairman), Colonel Boughey, and Mr. Gerald Fitzgerald, members of the Light Railways Commission, into an application by the British Electrical Traction Company (Limited) for an order to authorise light railways projected for the Potteries and Newcastle district. It was explained by Mr. Sellon, the engineer, that the British Electrical Traction Company proposed to utilise the disused tramway lines in the borough of Longton, to run lines to Trentham and Blyth Bridge, to continue the authorised line from Hanley to Newcastle by extensions to Silverdale (nearly three miles), to Chesterton (a distance of over two miles), from Newcastle to Wolstanton, and a short line to connect Tunstall with the Burslem and Wolstanton junction at Trubshawe Cross. The application was strongly opposed by the North Staffordshire Railway Co.; but the commissioners decided to grant an order, subject to the insertion of certain protective clauses.

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## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6	to £6 0 0
Rolled-Steel Joists, English.....	6 0 0	" 6 10 0
Wrought-Iron Girder Plates.....	6 15 0	" 7 10 0
Bar Iron, good Staffs.....	7 0 0	" 8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0	" 17 10 0
Do., Welsh.....	5 15 0	" 5 17 6

## Boiler Plates, Iron—

South Staffs.....	7 17 6	" 8 0 0
Best Snedshill.....	10 0 0	" 10 10 0

Angles 10s., Tees 20s. per ton extra.  
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	to £11 0 0
Best ditto.....	11 5 0	" 11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0	to £8 10 0
Cast-Iron Stanchions.....	6 0 0	" 8 10 0
Cast-Iron Sash Weights.....	—	" 4 2 6

## Cast-Iron Socket Pipes—

3in. diameter.....	5 10 0	" 5 15 0
4in. to 6in.....	5 5 0	" 5 10 0
7in. to 24in. (all sizes).....	4 15 0	" 5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

## Pig Iron—

Cold Blast, Lilleshall.....	105s. to 110s.
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.

## Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

Gas-Tubes.....	75p.c. Fittings 77½p.c.
Water-Tubes.....	70 " 72½
Steam-Tubes.....	62½ " 65
Galvanised Gas-Tubes.....	60 " 62½
Galvanised Water-Tubes.....	55 " 57½
Galvanised Steam-Tubes.....	45 " 47½

## Sheet Zinc, for roofing and work—

	Per ton.	Per ton.
ing up.....	£22 15 0	to £23 15 0

Sheet Lead, 3lb. per sq. ft. super.....	13 17 6	" 14 17 6
Pig Lead, in 10wt. pigs.....	13 5 0	" 14 5 0
Lead Shot, in 28lb. bags.....	16 5 0	" 17 5 0

Copper Sheets, sheathing and rods.....	63 0 0	" 65 0 0
Copper, British Cake and Ingots.....	53 0 0	" 53 10 0
Tin, Straits.....	61 17 6	" 62 17 6

Do., English Ingots.....	66 10 0	" 67 10 0
Spelter, Silesian.....	18 15 0	" 19 15 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£8 15 0	" 9 15 0
Cut Floor Brads.....	8 10 0	" 9 10 0

## Wire Nails (Points de Paris) —

0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9		per cwt.

## TIMBER.

Teak, Burmah.....	per load £13 10 0	to £16 10 0
" Bangkok.....	" 11 0 0	" 16 0 0

Quebec pine.....	" —	" —
" Oak yellow.....	" 2 5 0	" 4 5 0
" Birch.....	" 5 0 0	" 6 0 0

" Elm.....	" 3 15 0	" 5 10 0
" Ash.....	" 3 10 0	" 4 15 0
" Dantsic and Memel Oak.....	" 2 15 0	" 4 0 0

Fir.....	" 2 15 0	" 4 15 0
Wainscot, Riga p. log.....	" 2 10 0	" 4 15 0
Lath, Dantsic, p.f.....	" 4 10 0	" 5 10 0

St. Petersburg.....	" 5 0 0	" 6 10 0
Greenheart.....	" 8 10 0	" 9 0 0
Sequoia, U.S.A. ...per cube foot.....	0 2 0	" 0 2 2

Mahogany, Cuba.....	" 0 0 4½	" 0 0 6
" Honduras.....	" 0 0 5	" 0 0 6½
" Mexican.....	" 0 0 4	" 0 0 5

Cedar, Cuba.....	" 0 0 4½	" 0 0 5
" Honduras.....	" 0 0 4	" 0 0 5
" Saline.....	" 0 0 7	" 0 1 0

Walnut, Italian.....	" 0 0 3½	" 0 0 7
Deals, per St. Petersburg Standard, 12ft.—12ft. by 1½in. by 1½in. —		

Quebec, Pine, 1st.....	£21 0 0	to £23 0 0
" 2nd.....	14 10 0	" 16 10 0
" 3rd.....	7 0 0	" 10 10 0

Canada Spruce, 1st.....	9 0 0	" 11 0 0
" 2nd and 3rd.....	7 10 0	" 8 15 0
New Brunswick.....	7 10 0	" 8 0 0

Riga.....	7 10 0	" 8 10 0
St. Petersburg.....	9 10 0	" 13 10 0
Swedish.....	8 10 0	" 16 10 0

Finland.....	9 0 0	" 9 10 0
White Sea.....	10 10 0	" 17 0 0
Battens, all sorts.....	5 0 0	" 20 0 0

## Flooring Boards, per square of lin. —

1st prepared.....	0 9 0	" 0 16 0
2nd ditto.....	0 7 6	" 0 12 6
Other qualities.....	0 5 9	" 0 7 0

## Staves, per standard M:—

Quebec pipe.....	—	" —
U.S. ditto.....	35 0 0	" 42 10 0
Memel, cr. pipe.....	230 0 0	" 240 0 0
Memel, brack.....	200 0 0	" 210 0 0

## OILS.

Linseed.....	per ton £15 0 0	to £15 10 0
Rapeseed, English pale.....	" 27 10 0	" 28 0 0
Do., brown.....	" 20 10 0	" 26 15 0

Cottonseed ref.....	" 15 10 0	" 16 0 0
Olive, Spanish.....	" 29 0 0	" 30 0 0
Seal, pale.....	" 23 15 0	" 24 0 0

Cocanut, Cochin.....	" 27 15 0	" 28 0 0
Do., Ceylon.....	" 23 10 0	" 23 12 6
Palm, Lagos.....	" 23 0 0	" 24 10 0

Oleum.....	" 19 0 0	" 20 0 0
Lubricating U.S.....	per gal. 0 6 3	" 0 7 6
Do., black.....	" 0 4 9	" 0 6 6

Tar, Stockholm.....	per barrel 1 0 0	" 1 2 6
Archangel.....	" 0 12 6	" 0 15 0
Turpentine, American.....	per ton 21 0 0	" 21 10 0



## LIST OF COMPETITIONS OPEN.

Felixstowe—Laying-out Cliffs and Erecting Buildings .....	£50, £15	Jennings and Haward, Felixstowe .....	Mar. 1
Swansea—Workhouse Additions .....	10gs. (merged in commission) .....	G. B. Haynes, Clerk, 8, Fisher-street, Swansea .....	17
Enniskillen—Town Hall (£7,500 limit) .....	£50, £20, £10	Thomas Elliott, Borough Surveyor, Enniskillen .....	20
Christiania—Railway Terminal Station Plans .....	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s.	Railway Offices, 6, Victoria-terrace, Christiania .....	31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Wash- ington Browne, A.R.S.A., Edinburgh, Assessor) .....	£100 (merged in 4 per cent.), £50, £25	A. Macdonald, Town Clerk, Hillock House, Govan .....	31
Sheffield—Westbar Fire & Police Station (local Architects only) .....	Four premiums of £15	H. Bramley, Town Clerk, Sheffield .....	31
Guernsey—States Assembly Hall (£15,000 limit) .....	£100, £50	N. Dommale, Supervisor of Harbour, States Offices, Guernsey .....	April 17
Halifax—Police Station and Court House (no Assessor) .....	£51, £25	Keighley Walton, Town Clerk, Halifax .....	30
Elinc, France—Water Supply Scheme (3,300 inhabitants) .....		L. Marie, Elinc, Pyrenées Orientales .....	July 1
Carlton, Victoria—Children's Hospital .....	£101, £50, £25	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia .....	(1898) Jan. 30
Bolton—Fire Station (£12,000 limit, local architects only) .....	£50, £20	R. Gudgeon Hinnell, Town Clerk, Bolton .....	—
Nuneaton—Conservative Club (£3,000 limit) .....	30gs.	J. H. Bland, Solicitor, Nuneaton .....	—
Wandsworth Workhouse Infirmary—Nurses' Home .....	50gs. (merged in 2 p.c.), 20gs., 10gs.	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth .....	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Rishworth—Engine-House and Shed .....	Ryburn Mill Co. .....	R. Horsfall, Architect, 15, George-street, Halifax .....	Feb. 27
Purysburn, Belfast—Gate Lodge at Asylum .....	Commissioners of Control .....	G. E. Shanahan, Assistant Secretary, Board of Control, Dublin .....	27
Brynawr—New Church .....	Vicar .....	Nicholson and Hartree, Architects, Hereford .....	27
Bradford—Nurses' Home, Infirmary .....	Board of Management .....	Nilmes and France, Architects, Bradford .....	27
Folkestone—Mortuary at Cemetery .....	Burial Board .....	H. B. Bradley, Clerk, 52, Sandgate-road, Folkestone .....	27
Faughan—Renovation, Presbyterian Church .....	Gaslight Co. .....	Wm. Barker, Architect, 25, Orchard-street, Londonderry .....	27
Sheffield—Retort House, Coal Stores, &c. .....	United Gaslight Company .....	Hanbury Thomas, Secretary, Commercial-street, Sheffield .....	27
Rochdale—Three Houses, Albert Road's-street .....	Corporation .....	Bamford and Brockelbank, Surveyors, 58A, Yorkshire-st., Rochdale .....	27
Sheffield d—Retort House and Coal Stores .....	Harbour Commissioners .....	Hanbury Thomas, Manager, Commercial-street, Sheffield .....	27
Andover—Alterations to Town Hall .....	County Council .....	T. E. Longman, Town Clerk, Andover .....	27
Kingswear, Dartmouth—Alterations to Lighthouse .....	Geo. Ivers .....	E. H. Back, M.S.A., Dartmouth .....	27
Stotfield, Elgin—House and Shop .....	Board of Guardians .....	Reid and Wittet, Architects, Elgin .....	27
Durham—Bandroom, Earls House Industrial School .....	Committee .....	Wm. Crozier, County Surveyor, Shire Hall, Durham .....	27
Cork—Additions to Inchera, Durlkettle .....	A. Cameron .....	Jas. F. McMullen, M.S.A., 30, South Mall, Cork .....	27
Croydon—Schools in Dering-place, South Croydon .....	Corporation .....	B. Rule, Clerk, Catherine-street, Croydon .....	27
Newport, Mon.—Eisteddfod Pavilion in Cattle Market .....	Committee .....	T. L. Evans, Hon. Sec., 3, Commercial-street, Newport, Mon. .....	27
Gateshead—Houses and Shops, High-street .....	A. Cameron .....	J. G. Crowe, Architect, 50, Grainger-street, Newcastle-on-Tyne .....	1
Glasgow—Killing-rooms and Piggeries, Moore-street .....	Corporation .....	J. D. Marwick, Town Clerk, City Chambers, Glasgow .....	1
Culmington—Church Tower Restoration .....	Committee .....	Rev. D. E. Holland, Culmington Rectory, Salop .....	1
Hereford—St. Peter's Parish Hall .....	Great Northern (Ireland) Railway .....	Nicholson and Hartree, Architects, Hereford .....	1
Londonderry—Additions, County-Court House .....	Great Northern (Ireland) Railway .....	A. C. Adair, Architect, Londonderry .....	1
Clontarf—Station .....	Corporation .....	T. Morrison, Secretary, Amiens-street Terminus, Dublin .....	1
Termascoe, Armagh—Gatekeeper's Cottage .....	London County Council .....	T. Morrison, Secretary, Amiens-street Terminus, Dublin .....	1
Castlederg—Schoolhouse .....	A. Glover .....	Rev. Jas. Connolly, P.P., Urney, Strabane .....	1
Canterbury—Beane Institute and Library .....	School Board .....	H. Fielding, Town Clerk, 15, Burgate-street, Canterbury .....	1
Horton, Surrey—Foundations of County Lunatic Asylum .....	The Duke of Richmond .....	R. W. Partridge, Clerk, 21, Whitehall-place, S.W. .....	1
Morley—Mill .....	Co-operative Society .....	T. A. Buttery, Architect, Queen-street, Morley .....	1
St. Bee's—Alterations, Main-street, Schools .....	Corporation .....	F. W. Jackson, Clerk, 10, John-street, Workington .....	1
Gretna Green—House .....	School Board .....	—, McDougall, Gretna-green, N.B. .....	1
Dramin—Houses and Repairs on Gordon Richmond Estates .....	North-Eastern Breweries .....	—, Thomson, Architect, Fife Keith, N.B. .....	1
Wigan—Alterations to Premises, Powell-street .....	Vestry .....	Secretary, 93, Wallgate, Wigan .....	1
Marytavy, Tavistock—Re-seating Wesleyan Chapel .....	Geo. Fletcher .....	Rev. J. W. Simpson, West-street, Tavistock .....	1
Southend-on-Sea—Underground Conveniences, High-street .....	J. and T. Sawyer .....	W. Gregson, Clerk, Southend, Essex .....	1
Castlederg—Schoolhouse .....	Bellamy's Trustees .....	Rev. Jas. Connolly, P.P., Urney .....	1
Mole—School Enlargement .....	Great Western Railway Company .....	H. C. Roberts, Clerk, 16A, Wrexham-street, Mold .....	1
Middlesbrough—Additions, Cannon Hotel .....	Grand Jury .....	J. M. Bottomley, Architect, 28, Albert-road, Middlesbrough .....	1
Camberwell—Additions, rear of Vestry Hall .....	Leyton Urban District Council .....	O. S. Brown, Surveyor, Camberwell, S.E. .....	1
Hull—House and Stable, Gillett-street .....	Urban District Council .....	Gelder and Kitchen, Architects, 76, Lowgate, Hull .....	2
Middlesbrough—Buildings, Newport-road .....	Great North of Scotland Railway Co. .....	W. G. Roberts, Architect, 61, Albert-road, Middlesbrough .....	2
Rotherham—Four Almshouses .....	M. Halliwell .....	J. E. Knight, Moorgate-street, Rotherham .....	2
Brislington, Bristol—Passenger Station .....	Health Committee .....	G. K. Mills, Secretary, Paddington Station, W. .....	2
Comersal—Additions to Wesleyan Schools .....	J. E. Roberts, M.P. .....	J. W. Burrows, Architect, Birstal, Yorks .....	2
Corsycare and Drumcannon—Rebuilding Bridge .....	Joint Hospital Board .....	E. H. Archdall, Secretary, Enniskillen .....	2
Folla-Rude, N.B.—Additions, St. George's Church .....	Corporation .....	A. Clyne, Architect, 123A, Union-street, Aberdeen .....	2
Leytonstone—Sheds at Electric Light Station .....	Tuam Board of Guardians .....	Wm. Dawson, M.I.C.E., Town Hall, Leyton .....	2
Tottenham—Fire Station, Minster-road .....	Steam Laundry Co. .....	P. E. Murphy, Engineer, 712, High-road, Tottenham .....	2
Auchmacoy, Boddamin, Cruden, Longhaven, Pitburg, and Port Erroll—Houses .....	Corporation .....	The Engineer-in-Chief, 80, Guild-street, Aberdeen .....	2
Rochdale—Four Houses, Belfield-road .....	Leeds Industrial Co-operative Socy. .....	Bamford and Brockelbank, Surveyors, 58A, Yorkshire-st., Rochdale .....	2
Sheffield—Baths, Sutherland-road .....	Lees Knowles, M.P. .....	C. F. Wike, City Surveyor, Sheffield .....	3
Acrefair—Villa, Llangollen-road .....	Board of Guardians .....	—, Jones, Architect, Acrefair, Ruabon .....	3
Bangor—Alterations to Four Houses, High-street .....	Midland Railway Co. .....	R. Glyne Davies, Architect, 220, High-street, Bangor .....	3
Keighley—Pavilion to Fever Hospital .....	Corporation .....	Judson and Moore, York Chambers, Keighley .....	3
Southend Pier—Winter Garden .....	Joint Hospital Board .....	W. Gregson, Town Clerk, Southend-on-Sea .....	3
Abbey, Tuam—Dispensary .....	Tuam Board of Guardians .....	The Clerk, Tuam .....	3
Marsden—Alterations, Mechanics' School .....	Steam Laundry Co. .....	J. Kirk and Sons, Architects, Huddersfield .....	3
Dewsbury—Nine Houses, Cemetery-road .....	Corporation .....	J. Barton and Son, Architects, Halifax-road, Dewsbury .....	3
Dewsbury—Two Shops, High-street, West Town .....	Corporation .....	J. Barton and Son, Architects, Halifax-road, Dewsbury .....	3
Yarm—Primitive Methodist Chapel .....	Corporation .....	T. W. T. Richardson, Architect, 57, High-street, Stockton .....	3
Canterbury—Additions to Laundry .....	Corporation .....	W. J. Jennings, Architect, Canterbury .....	3
Kirkcaldy—Villas, St. Brycedale-avenue .....	Corporation .....	R. Little, Architect, 4, St. Brycedale-avenue, Kirkcaldy .....	3
Sheffield—Public Baths, Brightside .....	Corporation .....	H. Bramley, Town Clerk, Sheffield .....	3
Leshmahagow—Additions, Parish Church .....	Corporation .....	A. N. Paterson, Architect, 156, Wellington-street, Glasgow .....	4
Dewsbury—Seven Houses, Northfield's Estate .....	Corporation .....	Kirk and Sons, Architects, Dewsbury .....	4
Gloucester—Three Showrooms, George-street .....	Corporation .....	G. S. Blakeway, Town Clerk, Guildhall, Gloucester .....	4
Droumreague—Schoolhouse .....	Corporation .....	Rev. Wm. O'Donovan, P.P., Presbytery, Kilnamartyra, Macroom .....	4
Renanvarree—Schoolhouse .....	Corporation .....	Rev. Wm. O'Donovan, P.P., Presbytery, Kilnamartyra, Macroom .....	4
Renanvarree—Additions to Church .....	Corporation .....	Rev. Wm. O'Donovan, P.P., Presbytery, Kilnamartyra, Macroom .....	4
Clayton—Vicarage, Chrisbarben Park .....	Corporation .....	Sam. Spencer, Architect, 34A, Great Horton-road, Bradford .....	4
Horsforth—Twenty-one Houses, New-road Side .....	Corporation .....	J. W. Fawcett, Secretary, 10, Albion-street, Leeds .....	4
Strangford—Rebuilding Manse .....	Corporation .....	Rev. R. A. Beatty, LL.B., Strangford .....	4
Streatham—Completing Eight Houses, Telford Park .....	Corporation .....	F. H. Harvey, F.S.I., 183, Lavender-hill, S.W. .....	5
Weston-super-Mare—Alterations to Boulevard Baptist Chapel .....	Corporation .....	Price and Wooler, Architects, Weston-super-Mare .....	5
Mullingr—Dispensary .....	Corporation .....	Jas. Kenny, Hon. Secretary, the Dispensary, Loughnavalley .....	5
Derby—Wagon-repairing Shop .....	Corporation .....	Jas. Williams, Secretary, Derby .....	5
Gigha, N.B.—School .....	Corporation .....	Hugh Douglas, Gigha, Argyshire .....	5
Coventry—City Hospital Extension .....	Corporation .....	G. and I. Steane, Architects, Little Park-street, Coventry .....	5
Burnley—Fever Hospital, Kebble Bank .....	Corporation .....	W. T. Fullalove, Clerk, Town Hall, Burnley .....	5
Lydiard Millicent—Isolation Hospital, Parbon Stone-lane .....	Corporation .....	R. J. Bestwick, M.S.A., Fleet-street, Swindon .....	5
Middleton, Lancs.—Firemen's Dwellings .....	Corporation .....	Wm. Welburn, Borough Surveyor, Town Hall, Middleton .....	5
Yarm—Police Constable's House .....	Corporation .....	Walker Street, County Surveyor, Northallerton .....	5
Dovercourt—Three Shops and Houses .....	Corporation .....	New Town Estate Office, Main-road, Dovercourt .....	5
Chelmsford—Seven Houses .....	Corporation .....	F. Whitmore, Architect, 17, Duke-street, Chelmsford .....	5
New Hey—Rebuilding Baptist Sunday School .....	Corporation .....	E. J. Clegg, 160, Huddersfield-road, New Hey, Rochdale .....	5
Hebden Bridge—Additions to Croft Mills .....	Corporation .....	W. Wrigley, M.S.A., Crossley-terrace, Hebden Bridge .....	5
Saltash—14 Terrace Houses .....	Corporation .....	Mrs. Box, Beech-grove, St. Austell .....	5
Colchester—House .....	Corporation .....	Wm. C. Street, Architect, 7, Victoria-street, Westminster .....	5
Grithorpe, Flvey—House .....	Corporation .....	J. B. Fraser, A.R.I.B.A., 8, Park-square, Leeds .....	5
Halifax—King Cross Constitutional Club Additions .....	Corporation .....	Jackson and Fox, Architects, 22, George-street, Halifax .....	5
Grange-over-Sands—Cottages and Retort House .....	Corporation .....	H. Hibbert, Broughton-grove, Grange .....	5
Colchester—Erection of Buildings .....	Corporation .....	W. C. Street, Architect, 7, Victoria-street, S.W. .....	5
Londonderry—Shirt Factory, Great James-street .....	Corporation .....	Wm. Barker, Architect, 25, Orchard-street, Londonderry .....	5
Waterloo, Liverpool—Tower, Vestries, & Chapel at Christchurch .....	Corporation .....	Austin and Paley, Architects, Lancaster .....	5
Gosport—Alterations, Workhouse .....	Corporation .....	H. A. F. Smith, Architect, High-street, Gosport .....	5
Gacwen, Anglesey—Restoration of Church .....	Corporation .....	P. S. Gregory, Architect, Bangor .....	5
Chelmsford—Laboratory in Duke-street .....	Corporation .....	J. H. Nicholson, Secretary, County Offices, Chelmsford .....	5
Worcester—Chief Constable's House .....	Corporation .....	H. Rowe, City Architect, Pierpoint-street, Worcester .....	5



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### EXPERTS AND GENERAL PRACTITIONERS.

LONDON practice is necessarily more restricted than that which falls to the provincial architect. To a large extent it runs in "grooves"; certain special departments being taken up to the neglect of a general "all-round" knowledge of the profession. That there are distinct advantages accruing from such a specialisation or division of the profession is manifest to all. An intensity of vision, of study, and of experience is brought to bear upon a particular department of building that must, in the nature of things, be beneficial, and tend to the development of that particular branch. The skilled expert in a profession, whether it be in law, medicine, or architecture, looks at his subject in a very much more restricted and critical manner than the ordinary "general practitioner" can possibly do. His mind is not diverted or distracted by a multitude of details of a general business kind, and he can direct with a more microscopic eye his attention to points which would escape the attention of the Joneses or Robinsons of the profession. While they are, perhaps, "hazarding a guess," or "beating about the bush" for some clue or mode of procedure, the expert sense and keen eye of the specialist can at once detect the mode of operation which will produce the desired effect. He goes at once to the root of the problem, whether it be a legal question, the seat of a disease, or the plan of a building. If his fees are higher than the average run, the client at least has the satisfaction of knowing that his interests and wants are being looked after by one who is master of his business. In the case of the architect, this skill is not valued so much as it is in respect of property or matters of health, as we have only to look at the thousands of people of supposed intelligence, who purchase jerry-builders' houses, and obtain plans from builders. But the man who goes to a builder rather than to an architect does so for cheapness; he is satisfied with ordinary convenience, and has no preference for art or any high standard of plan. It would be as hard for him to distinguish between good and bad design as between good and bad music or painting. Not that the expert is always a genius; he is often devoid of it; and his skill consists in having devoted all his study and time to one class of work. In the plan, say, of a school, he knows the conditions of success, as laid down by the Education Department or the London School Board; exactly what a good plan ought to consist in—the location of classrooms to hall, of windows and doors, desks and other fittings, and we know this knowledge is half the battle in getting a plan passed. His knowledge is definite and exact, while the average designer has but a vague notion of what is necessary. In ecclesiastical work it is the same. How many a design has been rejected by the Ecclesiastical Commissioners for a faulty observance of rules as to width, wall thicknesses, seating, and other arrangements. So in buildings like hospitals, baths and washhouses, and those for technical instruction. It is worth while, certainly, to possess this exact knowledge, and it can only be obtained by practice in a large city, where the architect can get sufficient work of one kind to make it worth his while to devote himself exclusively to it. But in a small provincial town it would not be pos-

sible to limit one's attention even to two or three kinds of buildings. So it comes to this, that the professional expert can only flourish in a large city or metropolis like London, and the general practitioner is best off in the provinces. Whether architecture as an art is on the whole benefited by such a division of effort is doubtful. We will not now enter into this question. Divergent lines of thought are favoured by allowing each man to pursue his own bent. It is in many senses desirable that there should be those who devote themselves to the surveying or the artistic branches of the profession, for it is by this division of labour that each is relieved of work for which he has no liking. What can be more uncongenial and repugnant than for a man of cultivated taste, and who has mainly studied the art side of his profession, to find himself in a practice in which quantities, building accounts, and valuations are the main demands on his attention? Not a few enter the profession who are quickly undeceived as to the real nature of the business. It is a thorn to a great many men that the profession of architect is of this two-sided character, and probably the only way of making things pleasant is to take a partner, and agree to follow each his own kind of work.

The profession may be roughly divided into three classes—surveyors, plan experts, and artistic designers, and in the country town these three classes of practitioner are combined. Unless in a firm of two or three members, the several duties have to be discharged by the same individual. It cannot be denied that this combination of duties has a distracting effect on the mind. An immense number of details of business has to be transacted. Say it is the building of a country residence. This generally means a great deal more than straightforward architectural work—the purchase of the estate, valuations, drainage of site, the taking out of quantities, all of which work may be done just as well, if not better, by a surveyor; but the provincial architect finds it remunerative to take them. But the plan and architectural design of the house suffice. If the architect takes out his own quantities his time is too much occupied to enable him to give to the plan or the drawings the study and attention they demand. All the possible arrangements of plan for a given site which the plan expert is able to consider are out of the question; those niceties of adaptation which the artistic designer is able to turn to the best account in his exterior are ignored, and the external design suffers in consequence. The habits acquired in the "taking-off" quantities and bringing all features to the test of measurement and price is certainly not conducive to a free artistic hand; to a certain degree it is beneficial in avoiding extravagance of feature, but it is certainly not inspiring where the design is cut down to the level of the quantities or made to tally with price. We do not think the objection is removed when the bill of quantities is prepared by an outsider, for the arrangement often means a reduction of the plans to meet the ideas of the surveyor. For instance, a quantity surveyor often omits a break in a wall to save a hip and valley, or a gabled projection. The omission of a string-course may save a little at the sacrifice of a great deal, and we have known plain sash-windows inserted where mullioned casements were shown, completely destroying the character of the design. All this kind of concession is more practicable in the provincial town, where the contracted class of buildings are keenly competed for.

In questions of planning, the provincial practitioner holds his own in all the requirements of ordinary building—the country residence or villa, business premises, farm buildings, labourers' cottages, and the like, and, as a

rule, he gets on better where he can combine this with shrewd business qualities. The landed gentry, farmers, and agriculturalists generally are keen on plan, and they look for it. Much as they may like attractive-looking exteriors, they are unwilling to give up their own ideas as to what a good plan for a house or homestead ought to be. And all things considered, we think the average provincial architect is stronger in planning such buildings than his Metropolitan rivals. Take, for example, the plans for small dwellings and labourers' cottages. Many of our Metropolitan blocks of flats for the working classes are failures by comparison. The planning is cramped and ill-studied, and the men and women who unfortunately have to come to London and are housed in them complain of the meagre accommodation provided. The problem seems to be how to squeeze so many families in a flat. We instance this kind of building to show how a regulation plan in a great city falls short of the work done by an architect who has better means of studying the wants of the wage-earning class. Those we have enumerated belong to the class of buildings which the country or general practitioner has made his own. When he is called upon to prepare designs for a workhouse, a union infirmary, an asylum, his opportunities are less favourable than those of his brother competitor in London, who has a larger run of work of a similar kind within reach. Concentrated thought, division of labour, and special training come into play in the plans of the latter. Exactitude, precision of plan, economy of space, and a clear grasp of the conditions of the particular problem are observed.

As to the third division we have named the artistic, the difference between London and the provincial town is strongly marked. Although the provincial architect may possess higher artistic powers, he has fewer opportunities of turning them to account than his Metropolitan brother. In the first place, there is less really architectural work open to him. Every provincial practitioner is aware how few are the opportunities he has for the design of churches, municipal buildings, town-halls, and the like; whereas the architect in London, who has "gone in" for this sort of work, may be entirely engaged on it. The most gifted artist can get "rusty." A few years of hard work on commercial buildings, taking-off quantities, making surveys, and other everyday practice will incapacitate the most facile brain, and render the hand unable to express with satisfaction any artistic idea. No one better than the man who has cultivated his art faculties, and has entered into a provincial "all round" class of practice, can understand this. The hand, as well as the brain, becomes habituated to a particular kind of work, and it is only by great effort that they can recover their early capacity.

There are particular kinds of work which are open to the young architect who has an artistic bent—those connected with the various crafts. He may, for example, give designs for "artistic joinery" or furniture; for wall decorations, wall-papers; for iron and metal work, painted glass work, and ceramic work. Designs for these branches may be made remunerative sometimes, and some of them are quite within the range of the architect's profession. But in few even large towns would these branches be likely to be remunerative, where the architect of a building would undertake the decorative fittings himself, or hand them to a large firm of decorators. In the Metropolis it is possible to take up a particular branch of design with success. The expert may, by his skill, obtain a large connection among architects, decorators, and manufacturers. The conditions of study are more favourable; the work of design requires a studio, and facilities for easy reference to good examples, and these make it hard for



the general practitioner to take to it, whatever his ability may be. The question is no doubt a serious one with the profession in these days of ceaseless competition. In what department, or group of departments, can the architect turn his attention to make the best of his ability? Year by year it becomes more difficult for the general practitioner to obtain a footing in competition with men in special branches of work; year by year the field of practice is becoming more narrow, and it seems necessary for him to turn his attention to one or more particular lines of practice. A few leading architects have done this. In short, the evil of a large mixed practice is that, unless the work is subdivided, the details of business become so overwhelming that any satisfactory architectural effort is almost out of the question. We do not believe in delegating design to draughtsmen, as is often done in such cases; yet this course seems to be the only one open to men whose time is taken up so largely with details of surveyor's work, quantity taking, and builder's accounts. On the other hand, there may be an injurious restriction in the case of those who confine their attention to special branches. They lose the sense of proportion. The expert in one kind of building is apt to neglect a general sense of architectural design; he confines himself to absolute requirements, such as plan and fittings, and leaves himself little time or thought for the artistic treatment of his work. Or, again, the specialist in design is constantly ignoring the practical part of his art, so true it is that the life and work of every individual are conditioned or restricted by the lives and labour of others in the same vocation.

### THE LIGHT AND AIR DIFFICULTY.

**L**IGHT and air disputes are troublesome and vexatious matters which, in nine out of ten cases, can be more satisfactorily settled out of court, if only the parties could bring themselves into a calm and proper state of mind. Indeed, a large number of the cases that come into court are settled by some kind of compromise or arbitration in the end. Unfortunately, those who seek redress are not disposed to come to an amicable agreement at the outset. There is the sense of wrong on one side which is too irritating to pass over; on the other side, a sense of retaliation which is too strong to render any concession or apology. When a building owner raises his building to such a height that it practically overshadows his neighbour's windows, without saying what he is going to do, or offering any compensation or explanation, it is not surprising if his neighbour resents the obstruction, and that an unpleasantness takes place, which cannot always be allayed in time to avert legal proceedings. Those who are responsible for these building obstructions—and architects as well as owners are generally alike to blame—are the parties which should make the first advance, and not expect that the injured party—who may be the dominant owner—will quietly acquiesce or allow himself to be obscured. On the contrary, it is the injured party who generally has to complain after the mischief has been done. Of course, there is this to be said: each party may think he is in the right, and a dominant owner till the matter is taken in hand; but, at any rate, a meeting between the two parties—the dominant and servient owners—or their representatives is desirable, and will be found often to make it possible to settle the question by arbitration. The rights or position of each of the parties cannot always be known until their respective professional advisers meet to consider their claims and arrange matters again. The dominant owner often over-estimates

his right; while the servient owner is inclined to under-value light and air, in which case, unless the question can be decided by reference, legal proceedings are the only course open.

The most elementary facts of law are often overlooked in these questions. For example, how often an owner of a house with a window overlooking an adjoining plot of land belonging to another person, through which he claims a right of light, finds himself in the wrong. So long as the owner of the land adjoining agrees to the right of the dominant owner, all goes well; he may, in fact, sign an agreement acknowledging the house-owner's right; but should he sell the land to another party who knows nothing of the agreement, the latter may build so as to obstruct the light. But few buyers of houses so situated are aware of the fact that an agreement between the owners of servient and dominant tenements does not bind the purchaser of the servient tenement unless he has notice of this fact—a reasonable principle, when we come to consider it. Again, how often we find the acquiescence of an owner of a tenement, especially when he shows any consent, costs him trouble and litigation. The owner of premises adds a story or two, with the consent of his next-door neighbour. The latter afterwards wishes to build, but is prevented owing to his own acquiescence.

In an appeal case lately before the House of Lords, "*Chastey and Another v. Ackland*," reported in our "*Legal Intelligence*," the question was raised whether the owner of premises is entitled to protection not only in respect of his ancient lights, but also of a free circulation of air over and through the premises. Certain owners and occupiers of freehold premises in Exeter, carrying on business as lodging-house keepers, were the appellants, and the owner of an adjoining house, a dentist, the respondent. The appellants applied for a mandatory injunction and for damages for obstructing ancient lights and the free access of air, owing to certain alterations made by respondent. Mr. Justice Cave showed that there had been an interference with appellants' lights, and he assessed the damage at £10; that the new building made the appellants' basement damp and the rooms less healthy, caused smells, and, by checking the draught of the piers, caused the chimneys to smoke, and prejudicially affected the ventilation, &c. An injunction was granted, ordering the respondent to pull down a portion of the new building. The respondent went to the Court of Appeal, which reversed the decision of Justice Cave, on the ground that although the want of ventilation and the absence of means of carrying off the bad smells on the appellants' premises had been aggravated by the new building, yet nothing hurtful or disagreeable had been committed by anything that the respondent had done; that the appellants had no legal right to a free passage of air which would remove disagreeable smells created in their own premises. The appellants now sought to have this decision reversed, and that of Mr. Justice Cave restored. Ultimately it was suggested by Lord Herschel and the other lords that the matter might be settled by arrangement, and it was agreed by the parties that the appeal should be withdrawn, on the terms that the damages awarded on the appellants' claim for obstruction of light should be increased to £300; that the respondent should pay the appellants' costs; and that, even if it were decided they had a legal right to require the respondent's building to be pulled down in respect of air-circulation, they should not enforce it.

Into the merits of the case as reported it would be impossible to enter. The arrangement proposed was the only reasonable one, as, although it was proved there had been obstruction to light and to circulation of air, the

enforcement of the right to pull down the new building would have been questionable. The question of right to access of air is not so often in dispute, because such right is not acquired under the Act, as in the case of light; and there is seldom an action brought for loss of air without claim for light at the same time. The foregoing case is of some importance at a time when so many of our new lofty buildings in the crowded parts of London are threatening the healthfulness of premises occupied during the week by men, women, boys, and girls in lower stories and basements. Not only light, but the free circulation of air about buildings, is being cut off from premises that have always enjoyed both these valuable elements. It seems reasonable that access of air, as well as light, should be protected, and that the law should interfere to prevent a serious curtailment of either. Those who are engaged in such questions, will find many cases of interest and some useful observations on the subject in Professor Banister Fletcher's treatise on the question. From all the decisions that have been given there appears to be a general opinion that any interference with the access of air, impeding ventilation of lower rooms, causing dampness in basement stories, checking the draught necessary for flues, causing smoky chimneys, and other inconveniences are evils against which an action will lie. The pecuniary loss caused by these inconveniences is in many instances considerable, and compel owners or lessees to let those stories at much lower rents, which is, after all, the measurable damage sustained.

### NOTES ON THE PROPOSED BY-LAWS OF THE LONDON COUNTY COUNCIL WITH RESPECT TO HOUSE DRAINAGE.\*

By J. P. BARBER (Member of Council),  
M.Inst.C.E.

**T**HE absence of a uniform code of regulations on the subject of house drainage, applicable to the Metropolis, has for a long time caused great confusion and inconvenience to those engaged in the preparation of schemes for such work, as well as to those who have had to execute the work. Arrangements which are permitted in one district are objected to in another; whilst the requirements respecting the work vary considerably according to the views of the members of the local authorities on the subject, some considering that those who build houses should accept the responsibility of providing satisfactory drains and sanitary arrangements thereat, others, that the local authority should themselves prescribe in more or less detail what work is to be done and the manner in which it is to be carried out. The proposal of the London County Council to frame by-laws relating to house drainage has therefore raised some hope that in a little while uniformly satisfactory work will be insisted upon in every district in the Metropolis. The County Council have at length prepared draft by-laws which are at the present time under the consideration of the local authorities by whom they will have to be administered. Having regard to the area which will be affected by the proposed by-laws, it seems desirable that they should be carefully considered by engineers and others who will have to comply with them in all drainage works connected with buildings in the Metropolis on which they may be engaged. This paper has accordingly been prepared with a view to bringing the proposed by-laws to the notice of the members of this Society, and more with a hope of eliciting their opinions respecting them than the expectation of being able to say anything new upon the subject of house drainage. The proposed by-laws will be made pursuant to Section 202 of the Metropolis Management Act, 1855, by which the Council have power to make by-laws "for regulating the dimensions, form, and mode of construction, and the keeping, cleansing, and repairing of the pipes, drains, and other means of communicating with sewers, and the traps and apparatus connected therewith." The same section provides that no penalty shall

\* Read March 1, 1897, before the Society of Engineers.



be imposed by any by-law to be made by the Council unless the same shall be approved by one of Her Majesty's principal Secretaries of State. They are primarily applicable to drains, &c., at new buildings, and the extent to which they affect work at existing buildings will be referred to hereafter.

## BY-LAW I.

provides that no sub-soil drain shall communicate directly with a sewer, but that a suitable and efficient trap shall be provided, with a ventilating opening, at a point in the line of the sub-soil drain as near as practicable to such trap. This by-law does not prohibit the connection of a sub-soil drain direct to a drain which conveys sewage, or which communicates directly with a sewage drain; but in the author's opinion such a connection should not be allowed, as the foul air from the sewage drain will enter the sub-soil drain as readily as that from the sewer. In all three cases the trap is necessary, and it should be placed as near as practicable to the point where the sub-soil drain joins the sewer or either of the drains referred to, and should be ventilated directly into the open air. The pipes between the trap and the sewer or drain into which a sub-soil drain discharges should be of the same description, and should be laid and jointed in the same manner as those used for conveying sewage. This is necessary in order to prevent the escape of foul air from either the sewer or the drain into the trenches in which the sub-soil drains are laid.

## BY-LAW II.

requires that a pipe or channel provided for the purpose of conveying to a sewer any water falling on the roof of a building shall discharge over a trapped gully, or into such a gully above the level of the water in the trap. An addition to this part of the by-law is needed in order to make it compulsory that water falling upon the roof of a building and upon paths, areas, and paved surfaces within the curtilage of the premises shall be discharged into properly-trapped gullies and conveyed to a sewer, or shall be disposed of in some equally effective manner to the satisfaction of the surveyor to the local authority. It will be seen that, as the by-law is at present framed, no provision at all need be made for disposing of water from roofs, areas, paths, &c. Unless a satisfactory method of dealing with such water is insisted upon, the practice of erecting buildings or bay-windows without eaves gutters and of allowing the rain-water therefrom to fall upon and saturate the ground adjoining the building, and of making what are termed soak-away drains will be continued. It is, moreover, not uncommon for the rain-water from bay-windows, porches, and porticos to be conveyed therefrom by means of a down-pipe which terminates in the ground close to the building, and there is little doubt that unless this is made illegal by an alteration in the by-law, such a plan of disposing of the water will still be adopted. The second paragraph of the by-law will make it illegal for any solid or liquid matter from a waste-pipe, from a bath, lavatory, or sink, or from a soil-pipe, or waste-pipe, from a slop-sink, or from a urinal to be conveyed into a pipe or channel conveying rain-water. The arrangement at present allowed by many local authorities by which waste-pipes from baths, lavatories, and sinks discharge into the open head of a rain-water pipe, will not be permissible under this by-law. The following are the objections to the arrangement:—(a) Smells arising from the decomposition of refuse and greasy matter accumulated in the rain-water pipe and head. (b) Stoppage of the upper part of the rain-water pipe and head during frost, and the consequent overflow of water from the waste-pipes. (c) Inaccessibility of head of rain-water pipe for the purpose of cleansing and removal of obstructions. The smells referred to in (a) might not be injurious in cases where the pipes are situated some distance from windows or other openings to buildings; whilst the liability to the stoppage mentioned in (b) can be reduced by placing the waste-pipes in the head of the rain-water pipe in such a manner as to avoid splashing. The author thinks that the by-law should be so framed as to leave the local authority at liberty to sanction the fixing of waste-pipes from baths or lavatories so as to discharge into the open heads of rain-water pipes in cases where they are of opinion that the arrangement would be satisfactory; but that waste pipes from sinks should be prohibited from discharging in this way, as the greasy matter and small

portions of solid material which are frequently discharged through such pipes would be more likely to cause nuisances than the discharge from bath and lavatory wastes. The Council's proposal will involve a small increase in the cost of plumbing work at certain buildings where the rain-water pipes might be used to take the discharge from baths and lavatories to the gullies; but it cannot be objected to on sanitary grounds. Some local authorities require that a rain-water pipe shall discharge in an impervious channel, in the open air, leading to a trapped gully 12in. or 18in. distant from the point where such pipe discharges into the channel. The object of this provision is, no doubt, the prevention of foul air from the drains passing up rain-water pipes when the gully traps become unsealed. Although the arrangement referred to is frequently impracticable in town houses, the proposed by-law of the County Council might be altered so as to allow the arrangement to be carried out by those who prefer it, provided the channels are wholly within the curtilage of the premises. Water falling upon land, roofs, areas, or forecourts should not be discharged upon any part of the public way, and it would be for the comfort and safety of the public if the proposed by-law prohibited this being done.

## BY-LAW III.

deals with the materials for, and the sizes of, drains, jointing, concrete round pipes, means of access to drains, trapping of inlets, and other details. The by-law provides that pipes used for drains communicating with a sewer, other than subsoil drains, shall be of glazed stoneware, semi-vitrified ware, cast iron, or other equally suitable material. There appears to be no reason for the words "communicating with a sewer," for the drain referred to in the by-law should be of "good sound pipes," formed of the materials specified, whether it communicates with a sewer, with another drain, or with a cesspool. The thickness of metal for cast-iron pipes 3in. diameter is to be  $\frac{1}{8}$ in., and  $\frac{3}{16}$ in. for 4in., 5in., and 6in. pipes. The thickness of pipes formed of either of the other materials is not specified; but it seems desirable that the by-law should state that for 3in. pipes the thickness of the material should not be less than  $\frac{3}{16}$ in., and not less than  $\frac{1}{4}$ in. for 4in. and 6in. pipes. Pipes must be socketed and put together with cement or other equally suitable material. Cement is a suitable material with which to make the joints of pipes formed of stoneware or semi-vitrified ware; but lead is a more suitable material for the joints of cast-iron pipes. The by-law should, therefore, make the use of lead compulsory for jointing cast-iron pipes, otherwise disputes will arise when cement is used for jointing such pipes, and it will become a question for a magistrate to decide whether the use of cement in such cases is a breach of this by-law. The by-law should also specify that cast-iron pipes are to be coated with Dr. Angus Smith's composition, or other suitable material, in order that the pipes may be protected from corrosion, and that the inside may be glazed; also that the annular space for the lead with which the joints should be made shall, in 3in. and 4in. pipes, be not less than  $\frac{1}{4}$ in. in width, and in 5in. and 6in. pipes, not less than  $\frac{3}{16}$ in. A drain is to be of adequate size, and, if for conveying sewage, it must be not less than 4in. internal diameter, and be laid in a bed of good concrete not less than 6in. thick. The width of the bed of concrete is not specified, nor does it seem to be intended that the sides of the pipe should be incased in concrete. A pipe laid in such a manner as to comply with the proposed by-law would be very imperfect. An alteration in this by-law is necessary in order to provide that pipes shall be more secure after being laid. It is intended that underground drains of cast-iron shall be laid in a bed of concrete; but a thickness of 6in. for such bed is scarcely necessary, 3in. being sufficient for the accurate laying and solid bedding of the pipes. Cast-iron pipes are seldom laid on concrete; but having regard to the ease with which the accurate laying of the pipes can be carried out, and the perfect bedding obtained, this method is much better than the ordinary one, in which the pipes are laid on the bottom of the trench. A suitable fall must be given to a drain; but no minimum fall is mentioned. The drain must be constructed so as to be water-tight, and must be capable of resisting a pressure of at least 2ft. head of water. A drain must not pass under a building, except where any other mode of construction may be impracticable. So much of a drain as passes

under a building must be laid in a direct line, and be incased in 6in. of Portland cement concrete. Iron drains are not required to be covered with concrete, and they may be carried above ground if properly supported at each joint by piers or other sufficient supports. Whenever practicable, means of access must be provided at each end of that portion of a drain which is under a building. All inlets, except those provided for ventilation in accordance with By-law 4, are to be efficiently trapped; and the fixing of bell-traps, dip-traps, and D-traps is prohibited.

## BY-LAW IV.

requires that an intercepting trap shall be fixed in every main drain or other drain which shall communicate with a sewer. The trap is to be placed within the curtilage of the building. Means of access to the intercepting trap must be provided, for the purpose of cleaning, either by a separate man-hole, or other separate means of access. Intercepting traps and the means of access thereto would have to be inside buildings having no forecourts, vaults, or areas in front. In cases of this kind the Islington vestry has required the man-holes containing the intercepting traps to be placed under the footway; their reason for this requirement being the necessity for preventing the entrance of bad smells from manholes placed inside houses on the removal of the covers for the purpose of inspecting or clearing the intercepting traps. Under exceptional circumstances man-holes have been constructed inside buildings, and the vestry has required them to be provided with two air-tight covers, in order that smells might be excluded by the lower cover when the upper one became disarranged or damaged by the passage of people or goods over it. Great inconvenience would be caused by the cleansing of intercepting traps placed, in accordance with the proposed by-laws, inside shops or houses, unless there were basements to the premises. It seems desirable, therefore, that the proposed by-law should be modified to the extent of allowing some discretion to vestries as to the position in which the intercepting traps shall be placed, in the case of buildings having neither basements, vaults, areas, nor forecourts. The by-law contains no reference to the materials to be used in the construction of a manhole or other means of access to an intercepting trap. If passed in its present form, builders will be at liberty to use whatever material they choose for these appliances, and however improper the materials or the construction may be, no local authority will have power to interfere. Every advantage would be taken of this by those who seem to think that any quality of material is suitable for drainage work, and who will do nothing properly except under the strictest supervision, or until a summons has been issued against them.

## BY-LAW V.

prohibits right-angled junctions, and requires that a branch drain shall join another drain obliquely in the direction of the flow of such drain. If the words "and as near as practicable to the invert thereof" were added, it would prohibit a branch drain being joined to another at or near the top of the drain, and the risk of solid matter being deposited on the invert or splashed on the sides of a drain would be avoided. It is desirable, also, that the use of double Y-junctions should be prohibited on account of the tendency of a portion of the liquid and solid matter discharged by the branch drains to be washed up one or other of the branches, or up that part of the main drain immediately above the junction of the two branch drains.

## BY-LAW VI.

requires that the drains shall be ventilated in the manner generally adopted—viz., by two untrapped openings to the drain. One of the openings is to be near the surface of the ground, and is to communicate with the drains by means of a suitable pipe, shaft, or chamber; the other is to be obtained by carrying up from a point in the drains, as far distant as practicable from the first opening, a pipe or shaft, vertically, to such a height, and in such a position, as to afford a safe outlet for foul air. The sectional area of every ventilating pipe or shaft is to be not less than that of the drain with which it communicates. A soil-pipe or the waste-pipe from a slop sink may be used as the pipe or shaft which this by-law requires to be carried up from the drains, provided its situation, sectional area, height, and mode of construction are in accordance with the requirements applicable to the pipe or shaft to be carried up from the



drains. Any such soil-pipe or waste-pipe which has an internal diameter of not less than  $3\frac{1}{2}$  in., and which complies in all other respects with the requirements of the by-law as to the pipe or shaft to be provided for the ventilation of any drain, shall be deemed to provide adequate ventilation for any drain having an internal diameter of not more than 4 in. It appears unnecessary to require that where a person chooses to have a 6 in. drain to a house he should be required to fix ventilating pipes 6 in. in diameter, as one of 4 in. diameter would be sufficiently large to ventilate the drain. In all cases it is prudent to place the ventilating opening which is to be near the level of the ground as far as practicable from any door, window, or other opening to a building, as such ventilating openings, although commonly regarded as "fresh-air inlets," are found to act at times as outlets for foul air. The proposed by-law does not recognise this; but it might be safer to make the necessary addition, which would direct attention to the matter, as the ventilating openings referred to are often placed near windows or doors, and though provided with valves for the purpose of preventing the outlet of foul air, the valves become defective, or are prevented from closing by the accumulation of dust or other substances which are blown into them. It is the author's practice not to require the ventilating opening near the surface of the ground to be provided at a building where the drains can be satisfactorily ventilated by means of two soil-pipes carried above the roof, and he considers that the by-law should be altered in order to allow a similar practice, and also to permit both the ventilating openings, which the by-law requires to be provided, to be furnished by pipes carried to such a height as will provide a safer outlet for foul air. The material of which ventilating pipes are to be made is not specified. The by-laws should contain provisions similar to those in By-law 8, and the suggested additions thereto relating to soil-pipes and ventilating pipes. The by-law should prohibit the connection of a rain-water pipe or a waste-pipe from a lavatory, bath, or sink, except a slop-sink, to a ventilating pipe.

## BY-LAW VII.

is directed against the fixing of gullies inside a building in such a manner as to be connected to a drain communicating with a sewer. There are cases in which this arrangement cannot be avoided, and it is, therefore, desirable that it should be allowed, subject to the sanction of the local authority. The by-law further provides for the trapping of waste-pipes from baths, lavatories, and sinks. The traps are to be ventilated into the open air whenever necessary for the preservation of the seal of such traps. The waste-pipes are to be taken through an external wall, and are to discharge in the open air over a trapped gully, or into such a gully above the level of the water in the trap. Waste-pipes from baths or lavatories should, with the consent of the local authority, be allowed to discharge into the open heads of rain-water pipes, as stated in connection with By-law 2. The material of which waste-pipes and traps are to be formed is not mentioned, nor is the method of jointing them specified. The author has seen houses in which waste-pipes have been formed of zinc, the joints being made by pushing the end of one length of pipe into that of the adjoining length, and smearing the junction with putty. Those whose ideas of sanitary work are so low will readily take advantage of the proposed by-law, and provide waste-pipes of a similar description, unless the by-law is amended, and the material of which waste-pipes and traps shall be formed is specified. The only materials which should be allowed for such pipes and traps are drawn lead, galvanised wrought iron, stoneware, or material equally suitable, and the joints should be respectively wiped soldered joints, screwed sockets, or Portland cement. Another necessary addition to the by-law is a provision that the traps referred to shall be provided with movable caps for the inspection and cleansing of the traps. The necessity for prescribing that waste-pipes shall discharge over gullies or into gullies above the level of the water in the traps will be appreciated by those who have seen, as the author has, waste-pipes discharging into eaves gutters and even upon zinc flats and roofs, which have thereby been covered with grease and filthy refuse, the smell from which has been most offensive and injurious to the occupants of the houses. The by-law also requires that the overflow-pipes from cisterns and from safes under

baths or w.c.'s shall discharge into the open air. The overflow-pipes from lavatories or baths should be required to discharge into the waste-pipes on that side of the trap which is nearer to the lavatory or bath. This provision has been omitted from the proposed by-law.

## BY-LAW VIII.

relates to soil-pipes and the materials of which they are to be formed; also to the method of connecting traps thereto and of connecting soil-pipes and waste-pipes to drains. At new buildings soil-pipes are required to be placed outside wherever practicable—a proviso not contained in the existing by-law of the council, which requires that soil-pipes to such buildings shall in all cases be placed outside. The proposed by-law, by requiring that soil-pipes outside buildings shall be formed either of drawn lead or of cast iron, will prevent the use of zinc or stoneware for such soil-pipes, such materials being allowed under the existing by-law in consequence of the council having omitted to prescribe the material of which outside soil-pipes shall be formed. No soil-pipe is to be less than  $3\frac{1}{2}$  in. diameter. The weights of lead and of iron soil-pipes are specified, the former being equal in thickness to 8 lb. lead. Cast-iron soil-pipes  $3\frac{1}{2}$  in. and 4 in. diameter are to be not less than  $\frac{1}{4}$  in. thick, 5 in. and 6 in. must be not less than  $\frac{1}{2}$  in. thick. The sockets of cast-iron pipes must in no case be less than  $\frac{1}{2}$  in. thick. It is important that cast-iron soil-pipes should have a smooth interior, and that they should be protected from corrosion; and ventilating pipes through which no water is discharged need to be specially protected internally from corrosion, otherwise the bends connecting them to the drains become stopped by rust and the ventilation of the drains impeded. The by-law should therefore require that all cast-iron soil-pipes and ventilating pipes shall be either galvanised or coated inside with Dr. Angus Smith's composition. It is perhaps the experience of most engineers who have to deal with house drainage, that a cast-iron soil or ventilating pipe perfectly constructed is difficult to obtain. Usually the spigot ends are ragged and weak, the bottoms of the sockets badly formed and sloped so that the spigots get little or no bearing upon them, and the width of the sockets insufficient, so that when the molten lead is run in it seldom fills the sockets, but forms a shallow band round the upper part only. With such pipes firm and sound work is impossible, and it appears to be necessary that the by-law should specify that cast-iron pipes used for soil or ventilating pipes shall be made with the spigot ends beaded, with the bottom part of the socket at right angles to the axis of the pipes, and that the annular space for the lead with which the pipes are to be jointed should not be less than  $\frac{1}{4}$  in. wide. The method of connecting lead or iron soil-pipes with the traps of w.c.'s and with drains is the same as the County Council's by-laws at present in force. Whilst the subject of the connections of soil-pipes and waste-pipes to drains is dealt with in detail by the by-law, it might be still further extended so as to describe the construction of the pipe forming the connection between the soil or waste-pipe and the drain. This usually consists of an ordinary bend, which, unless incased in a block of concrete, is liable to slip, and the movement would destroy the joints at its upper and lower ends. Better and sounder work would result by the use of a bend with a flat foot or base attached. In all cases where a "wiped or overcast joint" is referred to, the word "metallic" should be inserted, so that the by-law may read "wiped or overcast metallic joint." The proposed by-law differs from that at present in force by requiring that the open end of a soil-pipe shall be carried to such a height as to afford a safe outlet for foul air, instead of to a point above the highest part of the roof of the building to which it is attached. An important omission from the by-law is the requirement that a wire guard should be provided for the protection of the open end of every soil-pipe.

## BY-LAW IX.

provides for the ventilation of the traps of w.c.'s, in order to prevent their being siphoned by the discharge from other w.c.'s connected with the same soil-pipe. The ventilating pipe provided for this purpose is to be formed of drawn lead, and with wiped joint if inside a building. This pipe should in all cases be formed of drawn lead, and if it has an open end, a wire guard should be provided for its protection. The word "metallic" should be inserted between the words "wiped" and "joint."

## BY-LAW X.

relates to the construction of slop-sinks and the traps and waste-pipes connected therewith. Similar provisions to those referred to in connection with cast-iron soil-pipes under By-law 8 should be added to this by-law with respect to cast-iron waste-pipes. A wire guard should be specified for the open end of every waste-pipe.

## BY-LAW XI.

requires that the pipes, drains, traps, and apparatus connected therewith at any building shall be maintained in a proper state of repair by the owner of such building.

## BY-LAW XII.

provides that any person offending against any of the foregoing by-laws shall be liable to a penalty of £2 for every such offence, and in the case of a continuing offence to a further penalty of 20s. for each day after written notice of the offence from the vestry. The last,

## BY-LAW XIII.

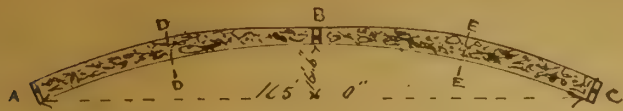
is as follows:—"These by-laws shall, so far as practicable, apply to any person who shall construct any pipe or drain or other means of communication with sewers, or any trap or apparatus connected therewith, so far as he shall effect any such works in any buildings erected before the confirmation of these by-laws, as if the same were being constructed in a building newly erected." From this by-law it would appear that the by-laws will, as mentioned at the commencement of the paper, apply primarily to work at new buildings, and, in the case of existing buildings, only to new work thereat, and that the local authority will have no power to require that the repair or reconstruction of drains shall be carried out in accordance therewith. Section 202 of Metropolis Management Act, 1855, under which the proposed by-laws are being made, does not limit the power of the Council to the making of by-laws for the purposes of regulating the construction of drains, &c., but included the "repairing of pipes, drains, &c.," in the list of matters respecting which by-laws may be made. It is, of course, important that the repair or reconstruction of drains, &c., at existing buildings should be properly carried out, especially as the necessity for the work generally arises from nuisance and illness caused by the defective condition of the drains and sanitary arrangements. Frequently the owner of the building, after the receipt of a notice from the local authority requiring the abatement of a nuisance, will have as little work carried out as possible, and where the whole of the drains need reconstructing to improved lines and levels he will do no more than re-lay them on the existing lines, and will then defy the local authority to compel him to do more, so long as the nuisance is abated. Having regard to such cases, it seems desirable that the words "or repair" should be inserted after "construct" in the by-law if the Council is advised that it would not be contrary to the Section under which the by-laws are made.

## MATTERS NOT DEALT WITH.

The following is a list of matters not dealt with in the proposed by-laws, and the necessity for by-laws relating to them will probably be self-evident:—(1) The submission to the local authority of plans and sections of proposed drainage works. (2) The scales to which the plans and sections are to be drawn, and the particulars which are to be shown thereon. (3) Work not to be commenced until plans, &c., have been approved by local authority. Manner in which such approval is to be given. (4) Work to be carried out in accordance with approved plans, &c. (5) Time for completion of work. (6) Work not to be covered until inspected and approved. (7) Notice to be given when work is completed and ready for inspection and testing. (8) Persons responsible for execution of work to fill drains with water in order that they may be tested by officials of local authority. (9) Work covered before being inspected and approved to be uncovered within 48 hours after notice so to do. (10) Time to be fixed during which work found contrary to by-laws is to be constructed so as to comply therewith. (11) Thickness of material for drains 9 in. and 12 in. diameter. (12) Materials of which gullies are to be made; covers to gullies; method of fixing gullies. (13) Surfaces adjoining gullies to be formed so as to prevent overflow of liquid discharged on grating, and to be paved with impervious paving where



FIG. 1.



necessary. (14) The construction of urinals, and the traps, pipes, and flushing arrangements connected therewith.

### CONSTRUCTION OF ARCHES IN CONCRETE.—I.

UNTIL any new design, machine, patent, or new material intended for the purposes of construction has passed a certain preliminary stage with assured success, it fails to attract the serious regard of either the professional and scientific man, or of the public in general. Once, however, it has emerged triumphantly from the fiery ordeal of severe tests, trials, and experiments, and has substantiated its claims to be fully recognised of public utility, its future progress is a mere matter of money, management, and intrinsic merit. Such is the present state of the structures constituting the title of our article. So long as they were constructed of spans so insignificant as to serve for little better than larger sized culverts and sewers, but scant notice was taken of them, and but scantier information existed concerning them. The first reproach, as will be presently demonstrated, has been effectually removed from them; but the latter still remains very forcibly in evidence. Indeed, we could not quote any one branch of architectural and engineering construction of which so little real and reliable knowledge is in possession of those most desiring and most requiring it. It is this open lack of technical information which has led us, in the interest of our readers, and particularly of our younger brethren, to take up the subject. It is our intention to supply this want, to furnish those perusing our columns with the necessary rules, data, and the best modern methods in use for calculating the strength of arches in concrete, to whatever especial character (for there are more than one) of design they may belong, and whatever especial features may be embodied in the building of them. There are, it is true, some properties common to all arches of whatever material they may consist, whether timber, brick, stone, concrete, or of metal. But while in some few points a similarity is to be found, it is far more of a theoretical than a practical nature. In the case of concrete arches, the latter are of so essentially different a description that, while they do not perhaps altogether obliterate the former, they modify it to so great an extent, as almost to deprive it of its peculiar and individual characteristics.

The example to which we are about to only briefly allude at present is put forward here, not as an excuse for our subject; but as a proof that the dimensions of arches built of concrete have advanced so rapidly and with such great strides within the last few years, that it is quite time that the whole question should be treated with the same amount of care, attention, research and skill, which have been bestowed upon similar structures of iron and steel. At home, it cannot be said that we have done very much to increase the dimensions of concrete arches. It is possible that the check given some years ago to building in concrete arrested the development of the arch, in exactly the same manner as the use of cast iron was partially abandoned, and owing to the same cause. It is well known that concrete, in the period to which we refer, was employed in situations and under conditions for which it was exceedingly unsuited, as was the case with cast iron. Thus both materials were ousted from what was their legitimate sphere of employment and certain utility, because they naturally failed to give satisfaction and afford reliable results when subjected to conditions and placed in positions for which they were entirely unfitted. But in France, Belgium, Germany, Austria, and in the United States, the construction of arches in concrete has been very much extended of late years. The example to which we draw attention as vindicating the validity of the statement respecting the increased dimensions of structures of this character is that of the Munderkingen concrete arch erected about four years ago over

the Danube. Its principal dimensions are:—Span = 165ft., rise = 16.5ft., and width between parapets 30ft. Even in these days of gigantic stretches, 165ft. is—over land and water—a very respectable length of chord, especially when concrete is the material in question. In order to draw the arch to scale, it will be first necessary to find the radius. Construct the diagram shown in Fig. 2, in which AC = the span of the arch = S. AD = DB = radius = R and BE =  $\frac{S}{10}$ , one of the Non-iron data. Then from the diagram—

$$R^2 = AE^2 + DE^2.$$

But by construction, in the triangle ADE—

$$AE = \frac{S}{2} \text{ and } DE = \left(R - \frac{S}{10}\right),$$

so we have for the value of  $R^2$ —

$$R^2 = \left(\frac{S}{2}\right)^2 + \left(R - \frac{S}{10}\right)^2.$$

Expanding the right hand side of the equation, it becomes—

$$R^2 = \frac{S^2}{4} + \left\{ \left(R^2 - \frac{R \times S}{5} + \frac{S^2}{100}\right) \right\},$$

from which we obtain—

$$R^2 = \frac{S^2}{4} + \left(\frac{5R^2 - R \times S}{5} + \frac{S^2}{100}\right).$$

Clearing of fractions, the value of  $R^2$  becomes—

$$100R^2 = 25S^2 + 100R^2 - 20RS + S^2.$$

Cancelling and reducing, the result is—

$$20RS = 26S^2$$

from which, finally,

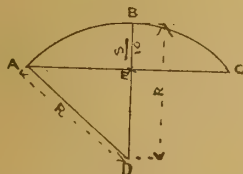
$$R = \frac{26 \times S}{20} = \frac{13 \times S}{10}$$

Substituting for S, its present value 165ft., we have—

$$R = 214.5\text{ft.}$$

which equals the radius required. There are one or two practical points deserving of attention, in connection with this concrete arch of maximum span. In the first place, it will be seen, on referring to Fig. 1, that the arch is pivoted or hinged at the crown B, and at both the springings A and C. The hinges, shown by the thick black lines, are of the best steel, and prove incontrovertibly the advances recently made in the erection of arches of this material, and the great care bestowed upon their location. Hitherto, hinges, pivots, or articulations have usually been limited in their application to arches of iron and steel. Another noteworthy feature in the Munderkingen structure is that the maximum thickness—and this is a somewhat novel and

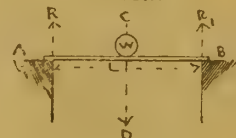
FIG. 2.



peculiar arrangement—of the arch does not occur at the springings, as is usual with similar designs in brick and stone, and of metal as well, but at the haunches. In Fig. 1, the thickness of the arch has been purposely exaggerated to render clearer this peculiarity. The greatest thickness is at the lines DD and EE, and amounts to 4.6ft., while the thickness at the crown equals 3.4ft., and at the springings 3.6ft. Elaborate tests and experiments have just terminated, which have been carried out in determining the strength and other valuable properties of concrete arches over a very considerable period of time in Austria and elsewhere, involving an expenditure of over £50,000. There ought to be a future for arches built of concrete.

In all experiments undertaken to determine the transverse, compressive, tensile, or shearing strength of any material intended for constructive purpose, the initial tests invariably fulfilled three conditions. These were, in fact, the unalterable data selected by the experimenters to be rigidly adhered to, and comprised, first, that the test-piece should take the form of a rectangular bar, of which all the three dimensions were comparatively very small; secondly, that the bar should be supported upon two immovable supports; and, thirdly, that the breaking weight should be applied at the centre of the, or exactly midway between the, two supports or abutments, as they may be termed. It is thus obvious that the resistance to transverse stress or cross-breaking was the first desideratum sought for. The other stresses mentioned were in some instances mathematically deduced from the foregoing; but the results were all more or less erroneous. Galileo fell into a fatal mistake by reasoning *à priori ad universale* in this particular instance. He was thus led to place the neutral axis of a rectangularly shaped timber beam nearly along the longitudinal edge instead of its proper position. Subsequently, further experiments were conducted with the direct object of ascertaining the powers of resistance of

FIG. 3.



beams and girders to other stresses, besides those of a transverse nature. The results derived therefrom were of a two-fold value. They not only demonstrated the fallacy of the preceding conclusions, based upon inductive reasoning, but established reliable data from which rules were derived which, with some after modifications, constitute the groundwork of our present knowledge on the subject of those stresses to which every description of architectural and engineering structure is constantly exposed. While it is admitted that experiments with test loads—which, it must be borne in mind, are *à outrance*—that is, prolonged to the actual breaking point of the specimen—do not coincide precisely with those afforded by the same crucial trials upon larger examples, yet they are of the greatest practical importance, and when they slightly err it is on the safe side.

The early experiments upon the resisting powers of concrete were made upon rectangularly shaped bars. The arrangement was similar to that represented in Fig. 3, with the exception that, instead of the weight W being superimposed on the beam, it was sometimes suspended from beneath. It is preferable to place the weight as shown in the illustration. The diagram itself is self-explanatory, and the arrow-heads indicate the direction in which the weight at the centre, and the reactions R and R1, at the points of support are supposed to act. These preliminary tests of rectangular concrete bars were instituted for the purpose of discovering the modulus of rupture, or of the modulus of the absolute fracture of the material. This is sometimes termed the coefficient of bending strength of the material, and as this definition is rather vague, it will be as well, for the benefit of our younger readers, to define it more clearly, to show how it is obtained, and its applicability to the subject of our article. Let M equal the bending moment, or moment of stress, produced by the weight W, at the centre of the bar or slab in Fig. 3. Let L = the span, b the breadth of the slab, and d its depth. Put F equal to the modulus of rupture, which is the greatest stress produced by the weight in those fibres or layers of the material, which give way first under the breaking stress, whether it be one of compression or tension. First, let us consider the attacking force, or that tending to fracture the bar at the centre. As the weight, which is the attacking force, is situated at the centre of the bar, if R and R1 represent the reactions, we have the general equation—

$$R = R_1 = \frac{W}{2}.$$

But the moment of a force is equal to the force itself multiplied by the shortest or perpendicular distance from its own locus to the point where the



stress is required. In other words, in order to obtain the moment of the force, it must be multiplied by its leverage about the same point. In the present case this perpendicular distance or leverage from either abutment is equal to half the span. If we put  $M$  as before for the bending moment, and  $P$  for the perpendicular leverage, the equation becomes—

$$M = R \times P = R_1 \times P,$$

but since  $R = R_1$  and  $P = \frac{W}{2}$ , we obtain for the value of  $M$ —

$$M = \frac{W}{2} \times \frac{L}{2} = \frac{W \times L}{4} \dots\dots(1)$$

But it is necessary for the purposes of equilibrium that, when near the point of rupture, the resistance of the slab should be just equal to the attacking force or bending moment. The moment of resistance of the concrete bar is equal, as already shown in our columns, to the moment of inertia of the section with reference to the neutral axis, multiplied by the coefficient of its bending strength, and divided by the distance of its extreme layer from the neutral axis. Let  $y$  = this distance, and  $I$  = the moment of inertia; then if the moment of resistance of the bar be equal to  $M_1$ , we have—

$$M_1 = \frac{F \times I}{y} \dots\dots\dots(2)$$

But  $M = M_1$ , and therefore  $M$  may be written—

$$M = \frac{F \times I}{y} \dots\dots\dots(3)$$

Our readers are aware that the value of  $I$  for a rectangular slab of any material is—

$$I = \frac{b \times d^3}{12}.$$

Since, also,  $y$  is the distance of the fibres or layer furthest from the neutral axis, its value is equal to  $\frac{d}{2}$ . Transposing, we find for  $F$  the modulus required—

$$F = \frac{M \times y}{I} \dots\dots\dots(4)$$

From above—

$$M = \frac{W \times L}{4}$$

and  $q = \frac{d}{2}$  so that substituting these values and that of—

$$I = \frac{b \times d^3}{12}$$

in equation (4), the formula becomes—

$$F = \frac{\frac{W \times L \times d}{4 \times 2}}{\frac{b \times d^3}{12}}$$

Cancelling extremes and means and reducing, we finally have for  $F$  its value—

$$F = \frac{3 \times W \times L}{2 b d^2} \dots\dots\dots(5)$$

It must kept be in mind that this is altogether an empirical formula, and that the value of  $F$  must not be confounded with that of the tensile strength of the material, as it sometimes has been. The contrary could very easily be proved by actually fracturing a few bars in a testing machine, and then calculating  $F$  by the formula given in equation (4).

A numerical value in the case of the concrete slab before us can readily be determined if we assign certain dimensions to the slab. Let  $b = 4\text{in.}$ ,  $d = 4\text{in.}$ ,  $L = 3\text{ft.} = 36\text{in.}$ , for all dimensions must be of the same denomination. Substituting these values in (5) we obtain—

$$F = \frac{3 \times W \times 30}{2 \times 4 \times 16} = 0.703125 \times W.$$

The value of  $F$  for rectangular beams of wrought iron and steel has been proved by the experiments of Sir Benjamin Baker to be greatly in excess of the actual tensile strength of the material. This proportion will be found to hold in the case of rolled joints of both iron and steel, although in those examples the value of  $F$  is less than what it is in the solid rectangular section. It is obvious that by testing bars of any material to the point of fracture, a number of values of the moduli of rupture may be determined, from which an average can be arrived at. In our next article we shall pass on to experiments conducted at different times, in which arches built of concrete were broken, either by direct weighting, or when the examples became too large for this

mode of fracture, by suitable testing machinery. Where possible, the employment of direct loading is to be preferred to the stresses produced by the intervention of apparatus in which the principle of the lever comes largely into play. At the same time, it must be admitted that the majority of the testing machines in use are marvels of accuracy, strength, and delicacy of adjustment.

## THE SOCIETY OF ARCHITECTS AND STATUTORY REGISTRATION.

THE monthly meeting of the Society of Architects, held on Thursday evening in last week at St. James's Hall, Piccadilly, took the form of a "smoker" and conversational discussion on the Architects' Registration Bill. The President, Mr. Robert Walker, J.P., of Cork, occupied the chair, and there was a good attendance of members. Mr. Herbert Henry Martyn, of Cheltenham, having been elected by ballot as an Associate, Mr. ELLIS MARSLAND, hon. secretary, introduced the subject of the evening in a brief and concise address. He referred to the action taken as the result of the conference of architects held in the Freemasons' Tavern in April, 1886—nearly eleven years ago, when it was resolved that steps be taken to obtain an Act "making it compulsory for all architects to hold a Government diploma." A committee was subsequently formed, and a Bill was introduced into Parliament in 1887, which included architects, civil engineers, and surveyors. Owing to the opposition evinced by the last two bodies, a fresh Bill was subsequently introduced, which was ordered by the House of Commons to be printed in March, 1893. Having thus traced the history of the movement, Mr. Marsland observed that the Society had no wish to take the lead in this much-needed reform, and if the Institute would but take the matter up in earnest, they would have the hearty co-operation of the Society. He asked: What was meant by Registration? In the present it meant that all men practising architecture should be duly enrolled in an official register under an Act of Parliament, and should be duly responsible for their professional actions, and that none should be allowed to practise until they had been duly enrolled. In the future it meant that none should be allowed to practise architecture until they were duly qualified, and had been found so by undergoing a qualifying examination. Why, if admission to the professions of the Church, Law, and Medicine was only to be gained after passing a qualifying examination, was Architecture not similarly protected? Could it be wondered at that architects were unrecognised, while the public had no guarantee that the class who called themselves architects were any better qualified to plan and design their buildings than the contractors who carried them out, and no warranty, should they employ an architect, that his knowledge was greater than that of the builder. He epitomised the advantages that would arise from registration, as closing the doors to incompetent men, raising the standard of the profession, and obtaining the confidence of the public, and State recognition. One objection often raised was that in starting they would have to register some of the very men whom they regarded as incompetent. This was quite true; but unless they did so, and respected vested interests, Parliament would not listen to their pleas. Another objection was, that it was impossible to examine in artistic qualifications. This was true; but an artist was no worse an artist because he had studied anatomy, perspective, and the chemical composition of the materials he used. In conclusion, he sketched the chief provisions of the Architects' Registration Bill, remarking that while he believed it met with the general approval of members of that Society, they were not, as a body, pledged to it in all its details.

Mr. HENRY LOVEGROVE, in opening a discussion, said he believed no architect was opposed to the principle of Registration; the only objection to the Bill was that just mentioned by Mr. Marsland—that it proposed to recognise the unqualified men who at present floundered along in the obscurity they merited; but the longer it was delayed, the longer would it be before this class of men—of whom he gave some ludicrous instances from his own experience—were extinct. Now that dentists and chartered accountants were registered, he did not see on what grounds Parliament could refuse similar protective powers to architects, provided they were sufficiently united in demanding them. The building owner,

occupier, and even the passer-by in the streets all suffered from the architect's want of knowledge and training. Registration in some form ought, he held, to go forward; but he feared it would be long before the Bill was passed, for the public were ignorant as to architects, and knew still less of architecture. Mr. G. A. T. MIDDLETON said he went a long way with Mr. Marsland. The argument that Registration would raise the position of the profession in the eyes of the public had better be dropped, for it was brought forward by opponents who averred that those who supported Registration wished to be hall-marked, whereas at present the architect took his position according to his eminence, independently of his profession. The Institute examinations had been entirely remodelled of late years: there were three in place of one, and the final was now so extraordinarily severe that no man in practice could afford the time necessary for preparation and for making the so-called "drawings of approval." An ordinary man needed to devote his entire evenings for two years for this final examination, and he did not think, therefore, that they ought to be the qualifying standard under the proposed Registration Act. As to the so-called artist-architect, it was desirable that even he should be examined to ascertain if he possessed a practical knowledge of the grammar of his art. Architects were, in that room, at any rate, so heartily convinced that the principle of Registration was right that there was really nothing more to be said. It had been politic, no doubt, to keep back the question for a time; but he trusted that when a favourable opportunity occurred it would be pressed forward.

MR. EDGAR FARMAN, hon. secretary to the Architects' Registration Committee, remarked that if the Bill had been promoted by the Royal Institute of British Architects, it would probably have been law at the present moment. He referred to the staunch support which had been given to the Registration movement by their President ever since it was originated at the Freemasons' Hall meeting eleven years ago. The Registration Committee were thoroughly in earnest; they were pegging on, and were going to carry the Bill into Law; and although, as with other measures relating to the medical and other professions, it would take time, he was confident that it would eventually pass.

MR. COOPER, of Hastings, strongly supported the Bill, giving instances from provincial experience as to its necessity. He believed that the R.I.B.A. was influenced in its opposition by a few influential men.

MR. R. COVENTRY DICK also supported the measure.

In closing the discussion, the PRESIDENT remarked that the meeting seemed to be in perfect accord with the promoters of the Bill, and he was especially pleased to see present so many of the earlier supporters of the movement. It was now going forward underground, and at the proper time it would emerge into the daylight. There were now many incompetent men in the profession; but directly the Bill passed there would be an end to incompetence. In eloquent and enthusiastic terms he urged the members to do all in their power to press forward the Bill.

## NOTES FROM EDINBURGH.

EDINBURGH, since the year began, has been exceptionally favoured, and little more than a sprinkling of snow accompanied the severe frost, which, however, did not suspend for more than a few days ordinary outdoor operations. The slater generally suffers most in such weather, and the days are short. Little remains now of the old North Bridge, and the three spacious spans of its successor can be plainly seen. The town council have decided to proceed at once with the portion of the improvement of North Bridge-street, which will make the appearance of the street from the other side more in harmony with the bridge when the time of the completion of the latter has arrived, and probably facilitate the proper junction of the two. The properties required for this have been acquired; but it remains to be decided whether the work is to be carried out by public or private enterprise. The design by Messrs. Scott and Williamson, the first premiated plans, will be carried out with any necessary alterations.

In the matter of industrial developments, and their effect on architectural design, Mr. Gibson, of Edinburgh, is perhaps the first to suggest the



application of some or other of the various methods of fireproof construction to domestic city architecture. To give a practical turn to what is more than likely to be found an expensive or impracticable innovation, he has offered £30 in prizes, confined to members of the Architectural Association here, to show, on the plans of an Edinburgh dwelling-house provided for the purpose, how it can be best and most economically made practically fireproof—especially in its floors, and walls, and roof.

He gives some interesting hints to competitors from his experience of houses built in the Argentine Republic, and objects to the heavy and costly concrete arches generally employed in making concrete floors. He thinks slate roofs should have the slating fixed on iron sheets, and screwed on from the under side, &c. The use of wood or inflammable material is not disallowed, and the object to be attained is to provide all the comforts and elegancies of the modern houses, while reducing the amount of timber in construction of the skeleton of the building, so that even if the furnishings were ablaze, the structure would remain intact. The result of the competition, if the adjudicators consider the plans to have met the conditions, will be interesting, as estimates of the comparative cost of the old system and the new are to be given. The prizes are not large, or likely to induce anyone, except through the attractiveness of the problem itself, to undertake the task. The state of the case suggests grave doubts as to the necessity of fireproof construction for Edinburgh or other city houses, and this is a damper to exertion in the cause. It is doubtful if any dwelling-house in Edinburgh has been burnt down with all the attendant mischief deplored by Mr. Gibson, within the memory of the oldest inhabitants, and Fire Insurance Companies are well aware that the premium for house insurance could be much reduced. Still, it would be well to save insurance altogether, and city conflagrations would be heard of no more.

The 71st exhibition of the Royal Scottish Academy has just been opened with 727 exhibited works, which is about 50 more than in '96, and half the number sent for exhibition. The general arrangements are as in recent years—i.e., the works placed are limited to those which can find room within a reasonable space above and below the line. The pieces of sculpture, which are moderate in bulk, are distributed through the galleries. The small octagon room has this year been made the gallery of architectural design and other etchings. The room has a bad name; but it is well adapted for drawings which are not meant for inspection except near at hand, and when the sky is clear there is abundant light. The interest of the exhibition this year centres in the selection of some characteristic and well-known examples of the work of the late Sir J. Millais, who was an hon. member. One of them, "Ophelia," is placed on a stand by itself. There are seven altogether, of which the one most likely to be generally interesting is his portrait of Mr. Gladstone. As usual, there are many portraits, but not so many on a large scale. There is no great picture to monopolise the interest of visitors other than those already noted. But a cursory inspection of the galleries is enough to indicate that in landscapes, as in portraiture, the exhibition is likely to be as attractive as any of its precursors. Subjects appealing to the imagination, of poetic or historic character, are, as usual, rather few and far between. Sir Noel Paton sends a small work "Puck," with a motto from "A Midsummer Night's Dream," recalling Carlyle's philosophy as to people being "mostly fools." W. G. Lockhart sends a very interesting sample of his genius in "A Mirror of Chivalry." "After Killiecrankie," by G. Ogilvy Reid, arrests the eye at once by the group gathered round the death-bed of Claverhouse. The scene is represented in a bright light, which gives full effect to the portraiture of the principal figure.

The water-colour department, to which the South Room has been set apart exclusively, is a much larger collection than it has been for years. It comprises a great variety of subjects. The "Black Watch at Fontenoy" is a large picture by W. S. Cumming, representing Col. Gardiner standing, when the regiment were ordered to fall down, under fire. Mr. Thorn Scott sends "A Scottish Mosstrooper," also a large picture.

Architectural designs are confined to the small octagon, and are much the same in number as last year; but there are fewer large drawings, and more of water-colour. There are two

interesting Soane Medallion drawings by Albert H. Hodge—the first premiated design for N. Bridge-street, and two drawings of the second premiated design by Marshall and Bradley. There are no large mansion houses, but several others, and only one church in course of erection. Thos. Bonner sends some large drawings in minute detail of decorative design, and there are many others which cannot be noticed in a cursory inspection.

The site for the Usher Hall is still under consideration by the committee; but the treasurer of the city has proposed another improvement scheme which has for its object the purchase of the Port Hopetown and Port Hamilton canal basins from the N.B. Railway, where, of course, a site for the hall can be obtained without disfigurement of any public squares or destruction of any valuable property. It is doubtful if the railway company will condescend to name a price till the council make up their mind to make an offer for the subjects. If the scheme gets over this initial difficulty, it will be at once put into operation, and will effect a great and much-needed improvement. The site provided for the hall would meet every requirement of the case, being central, conspicuous, and with ample means of access.

The new asphalt paving (with ground cork), which, at least, succeeds in removing the objectionable slipperiness of the material, has been laid in the Caledonian Railway Station, and will be used also in the new Waverley Station, where its durability will be fairly tested.

#### ADAPTABLE SPECIFICATIONS.

—XXXIII.\*

##### NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued.)

IN olden times tiled roofs, even in high-class buildings, were often constructed *without any lead whatever*. To form them so needed care and skill; but they have lasted all the better through having dispensed with the most troublesome material which the builder employs. It has been said, "the arch never sleeps." It might be said much more truly, that leadwork never sleeps. By day and night, in sunshine and shade, in heat and cold, it is alternately expanding and contracting; "creeping" down slopes, tearing itself away from fastenings, splitting into cracks, wearing into holes, sagging here and bursting there, till it wears out everybody who has to do with it, save those alone whose business in life is to doctor up its everlasting ailments. From these worries the possessor of a sound tiled roof was, so far, delivered. Of course, he had *tile hips, and valleys and ridges*, as we still have in such cases. But he also had *tile substitutes for flashings*, and step-flashings and soakers. The modern tiler likes these in lead, because they give his work what he calls "a tidy appearance." What he means by that is, that they allow the tile-courses to run straight and level everywhere, as if they had been ruled in by machinery. The ancient tiler preferred them to look as if they had been put in by a live man with his wits about him. Where the courses began at the gable verge, he boldly tilted them back, to keep the water from flowing over. Where they abutted against a wall, he tilted them up still more. If the bricklayer had provided him there with a raking string to cover their ends, he took advantage of it, and made them weather-tight underneath it with some composition of lime and sand and hair, which still remains fairly tough after the exposure of a century or two. If there was no raking string, he inserted, or had built in for him, a series of tiles projecting horizontally, each a course or two above the rest, and so contrived that driving rain, running down the face of the work, would catch on these and fall off on to the general roof-surface, well away from the wall. The system is cheap and picturesque; but probably the modern workman, who never seems happy unless he is turned into a mere machine, would object to it, and possibly even strike against it. In one respect, however, the modern tiler, or tile-maker, has really improved on the earlier one—he has learnt to make nibs to his tiles. In former times they only had holes. Then an oak peg had to be driven through each hole. In driving these pegs many tiles were split, and others failed afterwards, if the pegs absorbed moisture and expanded. With less

porous tiles than our ancestors had, and no danger of injury from pegs, we could easily make much better tiled roofs than they did—if our workmen were still craftsmen, and not mere cheap substitutes for steam-power and mechanism.

As it is, the *plumber* seems likely to remain amongst our roofs, at least, for the present. His work and the slater's are inextricably mixed up, and at this stage it will naturally come under notice. One of the architect's obvious duties here is to see that *the lead is of the right thickness*. An easily remembered rule is that 4lb. milled lead is as nearly as possible  $\frac{1}{16}$  in. thick, 5lb. lead  $\frac{1}{12}$  in., and 6lb. lead  $\frac{1}{10}$  in. In measuring it, care must be taken that the edge measured has not been thickened-out by the process of cutting. If this has happened, the true thickness can be arrived at by removing the edge for  $\frac{1}{2}$  in. back by a coarse file or rasp. *The quality of the lead* and its freedom from minute holes and other defects are quite as important as its thickness. Cast lead, not milled, is specially liable to imperfections, and has to be used thick to lessen the risk of them. If the lead supplied for each part of the work is sound and of the proper weight, the next thing to do is to see that it is used of the *proper size*. Do the gutters—especially at the wider part of each length—turn up to the proper heights under the roofs and against the walls? Do the cover flashings lap over them as far as they should do, and are they let far enough into the walls, well fixed with lead wedges, and pointed with cement? Many flashings are so carelessly fixed that a sharp pull will remove them. Then the architect is likely to find himself at variance with the plumber with regard to the *length between drip and drip* in a gutter, and the *length and width of lead sheets in a flat*. The greater these lengths and widths are, the less labour there is in laying the flats and gutters at first, and the sooner will come the time for "necessary repairs." Of course, the bigger a sheet of lead is, the more it is constantly expanding and contracting, and the sooner the expansion and contraction tear it apart and let through the rain. In Mediaeval work, lead sheets were commonly about 2ft. wide from roll to roll, and the less they exceed this, the longer they will last; 8ft., again, is quite enough for the distance from drip to drip, and the dimensions in each case should be clearly stated in the specification, and not exceeded in the execution of the work.

In the *jointing of sheet lead* it is an object to avoid solder and rigid fixings. The freer the metal is to expand and contract, the less liable it is to pull itself to pieces. Sometimes the end of one sheet of lead simply *laps over* the top of the sheet below it to a distance of 4in. or 5in. But even when this happens on a roof whose pitch is great enough to keep the water from being blown up or sucked up under such a lap, the lead is still liable to be disturbed there by the wind; while on a nearly flat surface, or where sheets meet side by side, a simple lap would, of course, not keep water out at all. In the latter cases *rolls* of one type or another are used at the lateral junctions. A roll should always run parallel, or nearly parallel, with the fall or "current" of the lead, unless in extremely steep roofs or spires, where the rolls often run diagonally. On one system the *roll joint* is made by fixing a wooden roll, varying from  $\frac{1}{4}$  in. to 2 in., or even 2  $\frac{1}{2}$  in., in diameter, on the top of the boarding on which the lead is laid. The edge of one of the lead sheets is then "dressed" over the roll, so as to fit closely to it and just cover it, and the edge of the adjoining sheet is dressed again over this. This upper covering of the roll should not be wide enough to absolutely touch the lead sheet on the further side, but a space of  $\frac{1}{4}$  in. or so should be left for the lead to expand into in hot weather. A *more trustworthy roll* may be made without any wooden cylinder beneath it. To form this the two edges of the adjoining sheets are not merely lapped and bent, but are folded together, so that each margin hooks into the other, and is not easily pulled away from it. The double margin thus formed is then curled up into the shape of a roll, and as it consists of several thicknesses of lead, it requires no additional support to stiffen it.

In lead flats or gutters, and in lead roofs of very low pitch, the joints at the ends of the sheets, and any other joints which form a large angle with the line of slope, are made by "*drips*." A drip is, essentially, a low step or riser. The end of the lower sheet turns up against this riser (which should not be less than 2in. high), and the end of the upper sheet is bent down vertically,

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and covers it. The latter should not quite touch the bottom of the drip, but should leave a small space for the expansion of the upper sheet. *Nailing lead* to woodwork is sometimes unavoidable. If iron nails are used, their heads should first be dipped into melted lead to prevent oxidation: they are then called "*lead-headed nails*." In securing lead to vertical surfaces, such as the sides of dormers, "*solder dots*" are often used. The point having been decided on at which a nail or screw is to be passed through the lead to secure it to the woodwork, the latter is hollowed out or "*countersunk*" in a circular area round the position for the nail or screw. Then the lead is dressed into this saucer-like hollow; a strong nail or screw is passed through the central part of the dressed lead into the wood below; and, lastly, to give the nail or screw a firmer hold on the lead, and to prevent it from rusting, its head and the surrounding hollow are covered up with solder. *Close-nailing with copper nails* is sometimes done to secure the top of a flashing, where it happens to run along a wooden surface instead of a wall. The lead to hips and ridges (when this metal is used for them) is generally only dressed over a wooden roll, and as this roll is not half so securely fixed to the wooden hip or ridge-piece beneath as it easily might be, the expansion and contraction of the lead ultimately work it off. Colonel Seddon suggests an improvement on this. The lead which is to be dressed over the roll may be used double, and folded on to itself on each side, so that it can easily expand and contract. For this purpose a strip of 4lb. lead, about 2ft. wide, is needed.

*Zinc*, which is even more affected than lead by changes of temperature, is best laid on *Brady's* or *Tyler's* system. In these systems, rigid fastenings are ingeniously avoided, and yet the roof is secure against all ordinary causes of disturbance. The "*folding-in*" plan is largely relied on; solder and nails are got rid of as attachments to the sheets of zinc, and *zinc clips* substituted. The quality of the zinc is of the highest importance. Spotty or speckly zinc is impure; and the impurities set up galvanic action and cause rapid decay. *Lime* and *lime mortar* will also destroy zinc, and nothing but *Portland cement* should be used for pointing the flashings. The tannic acid in oak timber likewise acts on it. *Drips* should not be more than 7ft. 6in. apart, and they should be 2½in. deep. *Flats* should have, if possible, besides the drips, a regular fall of 3in. in 10ft. If they can be made to fall as much as 1½in. in a foot, no drips will be needed, as the junction between the end of the sheets can then be safely formed by simply folding the metal. Gutters should have a fall of at least 3in. in 10ft. The gauges of *Vieille Montagne* zinc suitable for roofing are Nos. 14, 15, and 16, the first being only adapted to the very cheapest work. No. 15 gauge weighs about 2½lb. to the square foot.

*Copper roofing*, which is as light as zinc, and at least as durable as lead, seems likely to come more and more into fashion, especially for spires, domes, and similar architectural features. It is less affected than these other materials by changes of temperature, and it is free from the softness and heaviness which cause lead to fail by "*creeping down*" steeply-pitched roofs. Its comparative expense is the only thing which prevents it from coming into general use.

\* \* A correspondent, "W. J. P.," sends a communication relating to Article XXXII., on slating, illustrated by a diagram, which, as far as the section of the roof is concerned, seems to have been adapted from one of the popular examination handbooks. As it was remarked in the article, opinions are divided as to the best position for the nailholes in a slate. "W. J. P." prefers them, where there is a 3in. lap, to be about 1½in. above the middle of the slate, and in his experience it is the common practice to put them there. A standard work on the subject says, on the contrary, that "*it is laid down in most books that slate should be holed as near to the heads as practicable without breaking the edge, or to within 1in. or 1½in. of the head*," and having found this to be the prevailing custom in most parts of England since my acquaintance with slating began, some 35 years ago, I so described it. The merits and defects of both systems are pointed out in Article XXXII. When the nailholes are near the middle of the slate, there is some risk of getting rain through them; for, if the slate above is broken, there is nothing there to keep rain out. When the nailholes are, on the contrary, near the head of the slate—that is,

under the lap—there are two slates above them, and they are still protected, even if the upper slate is partly gone. On the other hand, the wind acts with more leverage when the nailholes are near the head; but unless the slates are very long and very light, this, in ordinary situations, is not important. The subject was fully discussed years ago, and apparently "W. J. P." can add nothing to what was long since said about it.

May I suggest to him in return that it is scarcely wise, in his section, to show the wall carefully stopped off at a rake which touches the undersides of the common rafters, and which thus leaves an open space 4in. or 5in. deep all the way along behind the eaves, for wind, birds, and snow to get in at? It can hardly have been the intention of his diagram to recommend this very primitive arrangement. But builders, when supplied, as they sometimes are, by junior members of the profession, with sections so drawn, have been known to execute the work in conformity with them, the result being a long bill for subsequent filling and making good before the building could become habitable.

#### TESTING IRON AND STEEL.

IN an instructive article on "Testing of Iron and Steel," which appears in the *Engineering Magazine*, by P. Kreuzpointner, the author shows that iron and steel are by no means the rigid, immovable bodies they are supposed to be by engineers and others who use these metals for structural purposes. The idea is entertained that their power of resistance does not change until they are worn out or break under a great force. On the other hand, they are shown to be most sensitive, and susceptible to outside impressions. All metals, even the hardest steel, are plastic and elastic. Iron and steel "*flow*" like viscous bodies under the application of sufficient time, pressure, or heat. The difference in the elasticity of iron and steel is one of degree only, and the greater the degree of, or the less the pressure is required to make it flow, the greater or the less is its elasticity. This property must, therefore, decide the value of either iron or steel for a given purpose, and the engineer who can best utilise this property or ascertain it is the better able to deal with iron and steel structures. The author proceeds to narrate an incident that occurred in his experience when testing a bar of spring steel 1in. wide, ¾in. thick, and 20in. long, with a tensile strength of 110,000lb. per square inch. To ascertain the elastic limit, micrometers measuring to the ten-thousandth part of an inch had been attached to ends of the test-piece, with wires leading to an electric bell, so causing it to ring whenever the points of the micrometers came into contact. When the piece was stretched however slightly, contact was broken, and the bell ceased to ring. One gentleman took up the steel test-piece and pulled it apart to explain the action of the testing machine to some visitors. The electric bell ceased to ring, showing that he had stretched the piece sufficiently to break the contact. This is recorded to show what small forces can affect steel, and the value of testing: With some apparatus, like Bouschinger's Mirror Apparatus, it is possible to measure the stretch of steel to 25000 part of a millimetre. Even for a stretch of this infinitesimal kind, a permanent set takes place, showing that the elastic limit is one of degree, and the most delicate forces operate. The author's conclusions and tables of results are important, and show the value of a uniform and standard shape and size of test-piece and methods of testing. He shows, in fact, that if the test-piece is not of the proper size and shape the "*flow*" will vary as these factors; and "if it takes more load to make the metal flow in one test-piece than in another that test-piece is at fault, and the test will be misleading by the difference in the loads respectively necessary to make the metal flow in one properly shaped and one improperly shaped." The test-piece ought, therefore, to be of a certain size and shape, that the metal may flow and continue to flow at the same rate under a load approximately equal to that to which the structure on which it is to be used is subjected. The engineer takes no account of these refinements of testing, and often reduces the sizes of his members to such an extent as to make them too weak. The object of testing ought, in a word, to be directed to ascertain the rate of flow of the metal and the force necessary to do so; but this can only be obtained by using

a test-piece of a given size and shape corresponding to the actual section to be used. The remarks and tables of results given are of interest to the engineer and architect.

#### WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XII.

THE differences in the methods of manufacture of iron and steel affect the dimensions of the rolled sectional forms. The first are light, the second are heavy; the first are short, the second long; the first are often, more or less, unsound, the second are generally homogeneous. We have seen that puddled iron cannot be prepared in masses so large as steel ingots, and that the larger the masses the more likely are they to become contaminated with dirt and scale, unless so much labour is expended on them as to render the cost very much higher than that of steel. When rolling wrought-iron, therefore, a single solid bloom of ordinary puddled iron is not sound enough to be rolled into a sound sectional bar, and it becomes necessary to build up piles of iron from smaller bars and weld them together into a form very roughly resembling in section that of the section to be rolled. This of two evils is the lesser, because the chances of dirt and scale being present are diminished; on the other hand, there is a risk of imperfect welds. The pile is made of a section much larger than the cross sections of the plate, angle, tee, or joist to be rolled, and this is reduced in section and extended in length by the process of rolling; bars of better quality are usually laid on the outside, and bars of inferior quality within. The rolling of large sections of iron is, therefore, not a question of machinery at all, since that which is available for steel might be available for iron also. It is a question of manufacture in the puddling furnace and of piling, in which it is impossible to deal with large masses in a satisfactory manner. Deep sections in wrought-iron were formerly produced by welding; such sections are now produced in steel without welding and of larger dimensions. At the present time there are few, if any, sections, which are not obtainable in steel. This was not the case in the early days of steel-making, partly because machinery was inadequate, partly because deep sections presented difficulties which could be got over in iron by piling and welding; the result is that sections in iron are being to a great extent superseded by those of steel. For some purposes iron is still used largely for tie rods and for buckle plates, and for some work in which welding is unavoidable; and for plates, angles, tees, and other sections in iron there is still some demand. Some of the great steel houses roll the majority of their sections both in iron and steel.

In all iron and steel which is rolled to dimensions and shapes there are two general limitations which exist—the first has reference to dimensions and weight, the second to sectional forms. These limitations are the chief reason for the necessity of building up the various members of large works; but for these limits the largest proportion of the riveting done could be avoided, and labour and weight saved. Lengths, widths, thicknesses, areas, weights govern constructional details, so that it often becomes a question of extra cost for material or extra cost for labour in jointing and riveting. As it is, by far the largest proportion of structural work is built up by half-a-dozen elementary rolled forms; these are the plate, the flat bar, the angle, the tee, the channel, the joist, the rail, and a few special sections which may be considered modifications of the above. The elements are very simple, the dimensions obtainable are very numerous, the combinations possible are most extensive, and, for all massive work, unavoidable.

It is not possible to obtain a column, or a stanchion, a larger girder, nor even heavy bracing without combining elementary forms by riveting. In reference to the limitations imposed by the sectional forms, which are of practical attainment, it is impracticable to roll any sections in which the webs are in any way undercut, or to roll sections in which the flanges bear an excessive proportion of depth to thickness. Even the cruciform section, which would be so useful, cannot be rolled of sufficiently large dimensions to be of much value for columns and stanchions; hence, when a large cruciform section is wanted, it must be compounded of other sections. If the universal rolling mill could be so perfected as to utilise the pressures of horizontal and vertical



rolls on large masses, firms could be produced which are not at present available. Efforts have been made in this direction by Continental designers, but without producing important results.

In reference to the other difficulty, that of rolling deep sections, the mills will roll channels and joists with specially thick webs, but not with very wide flanges; it is difficult to get a steel joist with flanges wider than  $7\frac{1}{2}$  in., though they can be had as wide in the web as 20 in.

The flanges of joists and channels are situated unfavourably for rolling; the action of the rolls is not regular and normal to the surface, as on the web. It is a squeezing of the material downwards, and, finally, laterally into the web, the action taking place along arcs of circles. As this is continued during several passes of the section the bar loses its heat too rapidly, and with it its plasticity, and the conditions are unfavourable to good results.

The nature of the limitations which are imposed upon the dimensions of sections is apparent from the foregoing; but considerable differences exist in the dimensions obtainable of the different houses. It is desirable to have definite knowledge of what is obtainable or otherwise, because designs would, without this knowledge, have to be altered, or, if carried out, would be unnecessarily costly. The limits of dimensions and weights obtainable for ordinary quotations are very easily passed; yet, with caution, it is possible to build up large structures without incurring much of extra expense on this account. The extras run broadly in two directions—extras for increase in dimensions, and extras for diminutions in dimensions.

Within certain limits the ordinary list-prices for iron and steel plates and sections hold good; beyond those limits prices are advanced at very variable rates. The limits are not quite absolute and uniform, however, since some firms roll sections at ordinary prices larger and smaller than those for which somewhat higher prices are charged by other firms; averages are, however, fairly constant. It is a question of plant, and therefore it is desirable to consult the lists of several houses before buying much material of maximum or minimum dimensions. The following may be summarised from various firms:—Iron plates and sheets are rolled by the Lillishall Company as follows, selecting only such thicknesses as usually come within the range of constructional work:—

TABLE X.

MAXIMUM DIMENSIONS OF IRON PLATES.

Thickness in inches.....	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{1}{4}$
Length in feet.....	12 0	12 0	30 0	30 0	30 0	30 0	30 0	30 0	30 0	30 0	30 0
Width in feet.....	4 0	4 0	4 6	5 0	5 6	5 6	6 0	6 0	6 0	6 0	6 0
Maximum area in superficial feet.....	20 0	36 0	45 0	50 0	60 0	70 0	80 0	80 0	80 0	80 0	80 0

The table below gives the maximum dimensions of sheets and plates rolled by the Steel Co. of Scotland, and also by the Dalziel Steel Co.

TABLE XI.

MAXIMUM DIMENSIONS OF STEEL PLATES.

Thickness in inches.....	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{1}{4}$
Length in feet.....	22 0	27 0	27 0	30 0	34 0	36 0	40 0	45 0	50 0	50 0	50 0
Width in feet.....	4 6	5 0	5 0	6 0	6 6	7 0	7 3	8 0	9 6	10 0	10 0
Maximum area in super. feet.....	28 0	54 0	75 0	100 0	120 0	135 0	150 0	165 0	220 0	225 0	250 0

The maximum dimensions are length, width, and area. But all cannot be had at once; if one is in excess the others must be reduced, because maximum dimensions mean that an ingot of a certain maximum weight is rolled to have an excess in length, or width, or thickness, or in two dimensions, but not in a third; the limit of weight of ordinary iron plates is 10 cwt., of steel from 40 cwt. to 60 cwt. An iron plate over 6 ft. wide is beyond usual limits, but steel plates are rolled up to 10 ft. wide; an iron plate of 30 ft. in length is the maximum possible, steel plates of 50 ft. are usual. For a plate, say, of  $\frac{3}{4}$  in. thick in iron, the maximum area is 80 ft., but in steel, for the same plate, it is 180 ft., or more than twice as much. The economy of the use of steel for much constructional work, therefore, particularly in bridge and girder building, is great, because the number of joints and rivets is lessened, with reductions in labour and dead weight; moreover, steel plates can, by reason of their massiveness of ingots, be rolled thicker than iron plates—1 in. is the limit of thickness in iron,  $1\frac{1}{2}$  in. in steel.

Since the limit of length and area varies with thickness, maximum length and maximum width cannot be combined; one can only be obtained by sacrifice of the other. Area divided by length in feet gives width in feet, area divided by width gives length. When maximum or minimum

dimensions are exceeded, then the large and rather puzzling list of "extras" comes in.

The Cleveland list of limits and extras for iron plates gives 10 cwt. for weight, and over that 10s. per ton for every hundredweight or portion of a hundredweight; length 20 ft., and widths, varying with thickness, from 12 in. to 48 in. Sketches, or sketch plates, are 20s. per ton extra and curved sketches 40s., but  $\frac{1}{4}$  in. of taper is allowed before counting as sketches; the ordinary limit of weight for the Yorkshire iron is only  $3\frac{1}{2}$  cwt.

The following is a summary of the principal extras charged by the Scottish steelmakers:—In plates from  $\frac{1}{16}$  in. to  $\frac{1}{2}$  in. thick, 4 cwt. is the limit of ordinary weight, and 17 ft. by 48 in. of dimensions; plates from  $\frac{3}{8}$  in. to  $\frac{3}{4}$  in. thick can be had of 10 cwt., and 23 ft. long by 60 in. wide. The limit of dimensions increases with thickness, so that, while for a  $\frac{3}{4}$  in. plate the limit is 26 ft. by 66 in., the limit for a  $\frac{1}{2}$  in. plate is 35 ft. by 90 in.; if a plate is only 3 in. wider than the maximum allowed for any thickness it costs 5s. per ton more. Increase in weight soon runs up. Thus, a plate of 90 cwt. costs 30s. per ton more than one of 60 cwt., for 5s. is added for each 5 cwt. over 60 cwt.; on the other hand, if thin plates are wanted of less weight than the minimum weight, 15s. per ton is charged for  $\frac{1}{16}$  in. plates and 30s. a ton for  $\frac{3}{8}$  in. plates.

The limits of steel plates supplied by Bolckow, Vaughan, and Co. are: Weight, 18 cwt.; length, 23 ft.; width, from 12 in. to 60 in.; area, 80 sq. ft.; 10 per cent. of sketch plates is allowed without extra charge, and nothing having more than 9 in. taper is counted as a sketch. Above 18 cwt. 10s. per ton is charged for every hundredweight or portion of a hundredweight, 5s. per foot extra in length about 23 ft., 10s. for every 3 in. above 5 ft. in width, and 5s. for every inch under 12 in. wide, 1s. per ton for every square foot above 80 sq. ft., 20s. for sketch plates. In general, plates for galvanising are usually charged 10s. per ton extra. Plates of 20 ft. in length and upwards, but under 12 in. broad, are charged 10s. per ton extra; sketch plates are charged at a rate of 20s. extra per ton. Any plates which are not parallel-sided are sketches; in some cases, 10 per cent. of tapered plates is allowed without extra charge. When a testing limit is narrowed to two tons tensile strain an extra of 20s. per ton is charged.

It is usual to order all plates of the correct shapes and sizes at the steelworks, leaving only

which a bar or plate shall be cut or arranged, and the second is able to bend and set steel bars or plates in one direction as well as in another. In the case of wrought-iron the strength crossway is three or four tons less than that lengthway; while, if severe bending or setting is done crossway, none but the very highest brands of iron will endure it without cracking.

J. H.

## BUILDING TRADES EXHIBITION.

WE remind readers that this exhibition at the Royal Agricultural Hall will be open from March 20th to the 27th. The Right Honourable the Lord Mayor, accompanied by the Sheriffs of London, will open the exhibition on Saturday, March 20, at noon. The following official visits will be paid, and meetings held during the week:

SATURDAY (OPENING DAY).—Visit of the Architectural Association, at 3 o'clock.

MONDAY.—Visit of the Association of Municipal and County Engineers, at 4 o'clock.

TUESDAY.—Annual Meeting of the Institute of Clay-workers.

WEDNESDAY.—Visit of the Builders' Merchants' Association of London.

THURSDAY.—Conference of House Painters and Decorators, at 7.30.

A good display of architects' drawings will be on exhibition; also loans from South Kensington Museum, the Corporation of London, the City Companies, &c.

## NOTES FROM PARIS.

THE new buildings of the Galeries du Museum, in the Jardin des Plantes, are nearing completion, and will form a very interesting architectural feature in this old quarter of Paris, which only a short time past was covered with picturesque but dilapidated old houses and laboratories. The principal portion of the buildings on the Rue Buffon is completely terminated, and already contains the important palaeontological collections transferred from the old museum. The architect, M. Dutert, has given to these new galleries a style of architecture of a simple but imposing aspect. The principal building is constructed of stone and terracotta; the decoration and compositions of sculpture are full of high artistic value. The central pediment contains a remarkable piece of sculpture by M. Allar, representing the three kingdoms of Nature; the keystone of the entrance arch contains a sculpture by M. Gardet. In the panels of the blind walls of the first story are a number of bronze and marble bas-reliefs, signed by a number of well-known sculptors, amongst whom are MM. Noel, Lanson, Marqueste, Fremiet, Gauquié, and Barrias. The bronze bas-relief representing the horse tamed by man, the work of M. Marqueste, and that of the Nubian slaying a crocodile, by M. Barrias, are worthy of special remark as *chef d'oeuvre*. The mouldings around the window-openings are decorated with corbels, on which are sculptured a number of various animals studied from nature.

The galleries are abundantly lighted, on the ground floor by the wide openings, and on the upper floor by means of a luminous ceiling, giving light from the roof. The walls of the large vestibule are decorated with paintings by Cormon, representing various palaeontological subjects. Above the pillars are a large number of various small animals carved in stone, and around the first pillar of the principal staircase a most realistic serpent has been carved. Besides the large museum galleries, the building contains several amphitheatres, laboratories, and rooms for the professors.

M. Henri Chardon, the general secretary to the Exposition of 1900 has just distributed to the various illustrated Parisian journals small scale reproductions of the designs for the two new palaces of fine arts to be erected in the Champs Elysées. The drawings for the smaller building are signed by the architect, M. Girault, and those of the large palace by the three architects, MM. Deglane, Louvet, and Thomas, with the visa of M. Girault, chief architect, and MM. Picard and Bouvard, commissaries to the Exposition. The collaboration of several architects for the design and construction of the same building is, therefore, an established fact. It remains now to see if the whole work can be carried out smoothly under such an arrangement. The drawings show that the design is harmonious and carefully thought out; but, although the style of architecture is certainly grandiose, the drawings do not reveal any special or interesting

sufficient margin for machining or for test-pieces if such are wanted in the contractor's works.

The weight of a cubic foot of Siemens steel is 490 lb. a square foot; a square foot 1 in. thick therefore weighs 40 lb.; on this basis the weight of plates can be calculated. The weight of a cubic foot of iron is 480 lb., and a square foot 1 in. thick therefore weighs 40 lb.; 5 per cent. is usually allowed on the weight of plates  $\frac{1}{4}$  in. thick and over; for sheets less than  $\frac{1}{4}$  in. thick 10 per cent. is allowed. The weight allowed to be received by the Admiralty is subject to a latitude of 5 per cent. above and below the weight specified for plates under 20 lb. per square foot, and to a latitude of 5 per cent. below (nothing above) for thicker plates. The average weight per foot of the material ordered is to be ascertained by weighing not less than 10 tons at a time when larger parcels than 10 tons are delivered; in smaller deliveries than 10 tons the average is to be ascertained by weighing the whole parcel.

One of the advantages which steel possesses over iron is that there is practically no difference in the strength in the direction of or across the direction of rolling; specifications seldom take any account of such a difference, but stipulate for the same behaviour in each direction; this greatly simplifies the work of the pater and smith. The first is not hampered in regard to the direction in



feature. The design is essentially Classic and Academic, and might be criticised as being scarcely in keeping with the modern views of design and rational construction of this *fin de siècle*. The Minister of Commerce has approved the plans for these two buildings, and the adjudication for the work of excavating and foundations for the larger palace will be made on the 15th of next month; the sum at which the tenders will start has been fixed at £22,000 for this work alone.

The committee specially formed to study the various interesting ideas proposed by a number of persons as attractive features for the coming Exposition has sent in its report, and has chosen for further examination about 80 schemes, some of which are exceedingly ingenious and interesting. The Académie des Beaux Arts has elected M. Maccari, of Rome, as foreign correspondent in the section of Painting, in the place of the late Mr. Manuel de Fonseca, of Lisbon. The Fould scholarship in sculpture, of the annual value of £50 during five years, is awarded to M. Maurice Benedetti, pupil at the Sevres manufactory.

French art will probably be well represented at the Universal Exposition at Brussels this year, and a certain amount of disagreement has taken place over the proposed arrangement for the composition of the French jury. The Minister of Fine Arts had fixed the composition of this jury in the proportion of five-eighths recruited from the ranks of the members of the Society of French Artists—i.e., the Champs Elysées section, and three-eighths from the National Society of Fine Arts—i.e., the Champs de Mars section. The Society of French Artists, however, sent in its protests against this proportion, stating that whilst this society numbers 2,716 exhibitors at the Salon of the Champs Elysées, the rival society, exhibiting at the Salon of the Champs de Mars, united only 340 members, and that therefore the proportion of votes granted to the latter society was unfairly high. It has at last been decided, after a certain amount of squabbling, that the proportions shall be two-thirds and one-third respectively.

The town of Versailles has borrowed the sum of three million francs for the purpose of rebuilding the town hall, and a competition in view of this has been opened between French architects. The principal portion of the existing hall will be preserved, and special care will be taken for the preservation of the well-known magnificent woodwork and paintings existing in the salons and galleries of the present hall.

The question of the utility and best routes for the proposed metropolitan railway for Paris has been put to the public vote, and 20,000 opinions have been inscribed by the Parisian public as to the various directions which this railway should take, the larger number voting for the route along the quays of the Seine. A curious protest has been made by the General Omnibus Company against the establishment of any railway or other means of public conveyance in the interior of Paris, as being contrary to the monopoly granted to this powerful company. It is to be hoped that such protest and rights of monopoly will not be allowed to hold good, for Paris is greatly in want of its metropolitan railway, for there is no other means of conveyance in common at Paris but by the omnibus and tramways of this company, and these are almost useless for the necessities of getting about the city in any practical manner.

A committee has been formed by the Minister of Fine Arts for the purpose of studying the question of insuring the proper installation of the Salons of 1898 and 1899, now that the Palais de l'Industrie is being demolished and the galleries of the Champ de Mars required for the coming Exposition. During the two years, therefore, until the new palaces of fine arts have been completed, temporary installations will have to be made for the annual salons of the two rival art societies.

The Assistance Publique is urgently following up the question of the construction of new hospitals at Paris capable of accommodating 2,000 additional patients suffering from consumption under the best possible conditions of isolation. The construction of the new hospitals and the rearrangement of the existing ones will require a sum of at least 30 millions of francs. A large surface of ground is being bought in the 18th District for holding a new hospital destined to relieve the present hospitals of Lariboisière and Bichat. Other buildings will be constructed in the other quarters of Paris for the purpose of

relieving the district hospitals from their excedent of patients, and as it is proposed to employ the most modern and scientific systems of installation and isolation, this work will no doubt be an interesting one to follow up later on.

At the Ecole des Beaux Arts, the annual competition founded by old American students, and entitled the American Competition, had for its subject the planning and designing of a large factory in Alaska, formerly Russian-America, where the temperature falls sometimes to 50° below zero. The building, to be constructed entirely of pine wood cut from the neighbouring forests, should comprise: a comfortable dwelling-house for the director of the establishment and his family, a common hall for the use of the trappers and military guard, and a small barracks capable of accommodating 40 men. The buildings for the business of the port, such as stores, sheds, &c., for containing the furs, cloths, arms, munition, &c.; an Orthodox chapel, and a Protestant church; covered galleries forming communication with the whole building, and a building for stabling the reindeer and dogs. The climate would necessitate thick walls, double windows, and especially an arrangement of door openings, the door-steps of which should be at least 4ft. from the ground, in order to allow for the heavy fall of snow in winter, and the ground-floor of the building therefore at the same level. The entrance to the building would be fortified, and be furnished with a draw-bridge. The laureate of this competition, very different to those of strict Classic style usually adopted at the Ecole, is M. Gougeon, whose clever design and ingenious method of construction entirely of pine logs carried off the unanimous vote of the school jury.

The official examination which has been made by the Court of Epinal for the purpose of establishing the final responsibilities resulting from the catastrophe of the Bouzey reservoir, which in April, 1895, cost the lives of 96 persons, has been terminated. The experts have proved that the reservoir dam would have perfectly resisted if the level of the water had not been allowed to rise to its maximum height—viz., an additional 53,000,000 ft. of water over the average cubage of ordinary years, and that the engineers, MM. Denys, Hauser, Holtz, and Henry, were guilty of negligence in allowing the reservoir to reach its maximum height of water without making immediate observations of this fact to the proper authorities. The above gentlemen have, therefore, been assigned to the Court of Epinal under the charge of homicide by imprudence, and the affair will come before this court on April 2 next.

#### HEPPLEWHITE'S CABINET-MAKER'S GUIDE.\*

WE lately noticed an admirable *fac simile* reproduction of Tijou's Book of Drawings of Ironwork published by Mr. B. T. Batsford, and we now have before us a copy of his lately-published reproduction of Hepplewhite's scarce book, "The Cabinet-Maker and Upholsterer's Guide, or Repository of Designs for Household Furniture." Careful reproductions of scarce editions of notable books or artistic crafts are valuable additions to the architect's and connoisseur's library. The revival of furniture in the Chippendale and Hepplewhite styles has not abated, nor can we wonder at the hold these fashions of furniture have taken on the minds and tastes of the cultured classes, considering the wretched kinds of designs which have been and still are produced. There can be no doubt these designs are distinguished for more simplicity and elegance. In this scarce edition of Hepplewhite we can trace the introduction of a more refined taste for furniture. A great deal of the so-called Chippendale work was spoilt by a floridness of manner that we do not see in Hepplewhite's work. These comprise, in the words of the old title-page, "a great variety of patterns" for sundry articles necessary in a complete suite of furniture "in the plainest and most enriched styles." In looking over the plates, of which there are 125, we find that all the designs are devoted to examples of furniture. Unlike the designs attributed to Chippendale, there is an avoidance of Rococo ornament, Chinese, French, and Gothic details, a refined treatment being seen in many of the designs. "To unite elegance and utility"—to adopt the opening words of the preface—was the chief aim of Hepplewhite, who

worked in the spirit of late 18th-Century work. The 300 designs are, further, practicable—any cabinet-maker may work to them. The chairs include the chief types used by this famous maker. The "shield-back," in various forms, including the swag-and-feathers device, so notable a variety of the author, are to be observed in the chairs given. Many of these are intended to be executed in mahogany, or in painted or "japanned" work, a prevailing fashion of the period, which mode of decoration enabled colour to be introduced, and afforded a variety of grounds. The backs and seats are of red or blue morocco leather; the backs in some cases have medallions printed or painted on silk. The japanned chairs had mostly cane bottoms. But it is the refined and simple treatment of the backs and frames which elicit our admiration, as those on plates 1, 2, 5, 6, 14, especially the square-framed back. The cabriole chairs with stuffed backs, the hall chairs of carved and painted wood, some with vase backs, are of interest. Stools, window stools, sofas come next, and include many unique designs, as on plates 25 and 26; the latter is a "bar-back" sofa. The "confidante" is a design of French origin. The designs for sideboards include many of extreme simplicity and elegance, with and without drawers; some are intended to fit into a recess. The author says it is the general custom to make them from 5½ ft. to 7 ft. long, 3 ft. high, and from 28 in. to 32 in. wide. Many of the designs are intended to be carved, inlaid, or painted. We particularly note those on plates 29, 30, with shaped fronts; 31, a very classical and refined rectangular-shaped table; also Nos. 32 and 34. The other plates illustrate many unique examples of pedestals and vases, cellarets, book-cases, tectadies, tea-trays, card-tables, dressing-tables, many of charming design and arrangement; but we cannot refer to all the subjects treated. Messrs. Batsford's reproduction of Sheraton, published some months ago, is now fittingly supplemented by this replica of Hepplewhite, which is more exhaustive and generally useful. The Late 18th-Century style still continues to enjoy the popularity it deserves, by reason of its quiet and refined mode of treatment. By the way, in this third edition of the author, the name is spelt "Hepplewhite," not as usually written, "Heppelwhite." Which is the correct way? The price of this beautiful replica is only £2 10s., and every admirer of the author and the period should possess a copy.

#### LAUNDRY APPLIANCES.

DURING recent years, laundry machinery has been much improved. The catalogue published by Messrs. D. and J. Tullis, of Kilbowie Ironworks, near Glasgow, and of 52, Queen Victoria-street, E.C., show the development of the laundry trade, and ought to be studied by all designers and builders of public laundries. Various machines are illustrated, and their size, speed, weight, and horse-power are described. Tullis's patent rotary pressure washing and disinfecting machine appears to combine every requisite. It is made in four sizes, 40 in. by 52 in., 47 in. by 52 in., 49 in. by 52 in., and 59 in. by 52 in.; these sizes have a capacity varying from 110 to 260 sheets. These machines are fully described, and are made of metal, with an outside shell of mild steel, boiler-plate with ends of cast iron, strongly ribbed. The inside shell is made of sheet-brass, perforated, riveted to strong cast-iron ends. The gearing is arranged so that each machine may be worked separately, or together. The inside shell is reversed every two revolutions, which prevents the goods becoming entangled. These machines can be worked easily and safely. The rotary washing-machine is made in three sizes, and consists also of an outer shell of mild-steel plate, in halves, riveted to cast-iron ends, and the inside shell is of heavy sheet brass, perforated and riveted to cast-iron ends. The V-shaped rubbers fixed to inside periphery are hollow, and fill with water as the inside shell revolves, which causes a continual showering, and helps the washing and rinsing greatly. The details of these machines have been ably worked out, and the automatic reversing gear is simple, and works well. Illustrations are given of a wooden washing-machine, and of the patent brass inside shell for washers, which can be easily fitted to any of the Tullis machines. These inside shells are made so as to minimise the wear on the goods. We notice also illustrations and descriptions of

\* London: B. T. Batsford, 94, High Holborn, London.



the "self-balanced hydro-extractor," Tullis's system of drying-closets, which are worth the attention of architects. These closets show several improvements. Steam radiating coils or hot air may be used, the hot air being delivered at the bottom, and the moist air carried away by large air-tubes at the ends of chamber. Those specifying machines and fittings for laundries will find Messrs. Tullis's catalogue useful.

#### A CHALLENGE TEST.

THE quality of the ordinary pipes supplied by Messrs. John Knowles and Co., of 38, King's-road, St. Pancras, N.W., being challenged by an engineer to one of the Metropolitan local authorities, they requested him to take any pipes haphazard from their depot stock of ordinary quality, and submit them to a test. He accordingly marked three 6in. pipes of their stock of ordinary pipes then on hand at the depot, and sent them himself to the Broadway Testing Works, Westminster, S.W. The following is an extract of the certificate of the three pipes submitted to the bursting test:—

BROADWAY TESTING WORKS, WESTMINSTER, S.W.

W. Harry Stanger, M.Inst.C.E., F.C.S.

BURSTING TESTS.

W. S. H. Test Number.	Marks.	Pressure at which Pipe Burst. Pounds per sq. in.	Remarks.
8797	John Knowles & Co. Wooden Box.	250	No signs of "sweating."
8798	Burton-on-Trent. Ditto.	625	Ditto.
8799	Ditto.	250	Ditto.

The value of such a test, of course, consists in the fact that it was entirely unpremeditated, and was applied, not to pipes specially prepared for testing, but to ordinary pipes such as the firm usually supply. The test proves conclusively that "Vitrified" Stoneware is not inferior to any manufacture of stoneware in the kingdom. The point is worth noting by all architects and builders in the face of the fact that many engineers continue to specify goods made in, or with, clay from a certain district. All readers may, we are sure, continue to specify "Vitrified" Stoneware as equal in every respect to that of any other make or district.

#### QUANTITY SURVEYING.\*

THE third edition of this very useful handbook by Mr. J. Leaning contains much that is new to the reader of the older editions. One very important feature in the volume is the item in each trade as it is introduced in the bill of quantities, which adds much to the practical value of the work to students. The measurements of each trade is also fully set forth. Thus, under "Bricklayer" every direction will be found full and explicit on points of doubtful practice. Thus it is stated, "Where the stonework of a building consists principally of quoins it is sometimes not deducted; but the course adopted should be clearly stated in the bill." Again, "No deductions are made for flues under 2ft. square in diameter; but a flue of such size would certainly be for a furnace chimney. In such cases measure the shaft and deduct the void. Keep the brickwork separate, and state that it has been measured net, and what it is." The instruction to measure external walls up to a convenient level, such as the ground-floor level, then the internal walls up to the same level, is not often strictly followed. After that, the projections are to be taken up to the same level. The rule to finish measuring the whole of brickwork up to a certain level before anything is taken above is desirable, though we are afraid it is often broken. So, again, it is recommended to leave all chimney-breasts and shafts till after the general brickwork is taken off, then take one stack at a time from concrete to finish. The directions given on "facings" as "extra on common brickwork" are clear. Of course, it is important to take the kind of "pointing" with the superficial measurements, the kind of brick, bond, &c., used, and to

deduct all openings and gauged arches. The author measures the full depth of the reveals as facing, instead of only half. The items given under this heading are clear, as for example:—

1,850ft. 0in. -supl.—Extra on common brickwork for facings of picked stocks laid in old English bond, finished with a neat struck bevelled joint as work proceeds.....

Extra on picked stock facings for gauged arches in Brown's best red rubbers set in cement, &c. ....

Or, if a better sort of facing in bands and quoins is used, the item will run:—

"Facings of Lawrence (Bracknell) best red facing bricks, laid Flemish bond in small quantities in quoins and bands, and raking out and pointing with blue ash mortar."

The mason is treated with much comprehension, and the items of bill given in each case; and so of the other trades. The chapters on "Abstracting," with examples, are very useful, also that on "Billing," is very full. The chapters on "Restorations," Schedules, Accounts, Prices, Approximate Estimates, the Law as it Affects Quantity Surveyors, and the Examples of Taking Off, illustrated by the plan and details of a dwelling-house, are valuable additions. There is a good index, and Mr. Leaning's practical work will long be recognised as a standard textbook on the subject.

#### CHIPS.

Plans prepared by Mr. R. Philip Day, A.R.I.B.A., have been adopted for a new church, to be built at Herne Bay. The style is Early Decorated, and the building will consist of nave, aisles, chancel, and chanceries, with a vestry and a narthex. Provision is made for a western tower when funds are forthcoming. The estimated cost of the building is £7,000, towards which £2,000 is promised.

The promoters of the Deane Valley Railway Bill have deposited an estimate of £580,475 as the cost of the whole of the 23 miles of railways and other works proposed to be constructed. This expenditure includes £57,000 for tunnelling, £40,000 for viaducts, and £11,431 for a dock on the river Deane.

The Committee of Glasgow Corporation Improvements Trust have recommended that specifications be prepared and offers invited for the erection of tenements on the south side of Stobcross-street, and also at the corner of Stobcross-street and Clyde-street. The probable cost of the Stobcross-street tenements is calculated at £10,130, and the rents will give a return of £743 8s. 0d. The probable cost of the other tenements is £5,440, and the gross rental at £197. The proposal to erect tenements at the corner of Bain-square and Gallowgate, William-street, Greenhead-street, and Cumberland-street was also considered. The committee recommended that the erection of these tenements be delayed for a year.

Steps are being taken at Harrogate to raise subscriptions for building a technical institute and school of art as a memorial of the Queen's reign.

Mr. John Tweed, of Chelsea, a young artist of the Glasgow School, has been commissioned to execute the statue of Mr. Cecil Rhodes which is to be placed in Bulwago. Mr. Tweed has just completed a colossal statue of Van Riebeck, the first Dutch Governor of the Cape, which is now being cast at the foundry at Thames Ditton. He also executed the pediment on Mr. Rhodes's house at Rondebosch, recently destroyed by fire, representing the first landing of the Dutch at Cape Town.

The city council of Coventry adopted last week a report by a committee recommending that the alterations and additions to the police buildings be carried out at once. The committee further reported that Mr. C. Gray Hill, of Coventry, whose tender was accepted for the proposed works, had sent in an application for an allowance on his contract on account of the prospective rise of wages in the building trade. They added that the longer the commencement of the work is delayed the greater will be the effect of the increase of wages on the cost. The contractor was willing to accept an addition to his tender price of £300, making a total of £13,141, and an extension of the time for completion from nine months to twelve, on condition that he is allowed to proceed with the work at once. The committee recommended that these terms be accepted, and the report was adopted.

Tenders have been accepted amounting to £1,850 by the Wesleyan Church at Marsden for the enlargement of the chapel and schoolroom, the addition of a suite of classrooms, and the provision of larger rooms for the meetings of the young people of the church.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—On Monday, the 22nd February, Mr. A. N. Paterson, M.A., in the chair, Professor F. N. Simpson, of Liverpool, delivered a lecture on "Reticence in Art." All art, the professor said, had its limitations, but no hard-and-fast rules could be laid down. The quality of restraint was the best quality an artist could possess, and the power of selection the best proof of a man's strength. No compositions of art, said the lecturer, were more original, and displayed more reticence than were to be seen in the paintings and writings of Mr. Whistler. The limitations of architecture were more strict, as the possibilities were greater than the sister arts. A building should harmonise with its surroundings, and form a part of the landscape. Old buildings always harmonised with each other, the principal reason being that reticence was given full place to in their design. Over-elaboration, said the professor, was one of the greatest evils of our modern buildings. A building may be a noble monument of architecture with practically no ornamentation at all. Referring to decoration, the professor stated that the fewer colours used the more satisfactory would be the result. In wall decoration, no more than two main colours should be used. In a living-room, the professor opined, the two colours should cover the chairs, hangings, and other furnishings; other colours should be used sparingly. The lecturer then treated on the subject of mural decoration. This, he said, was the noblest branch of the painter's art. In England it was much neglected in the past, and was not yet properly encouraged. In Italy mural decoration was to be seen at its best, and the lecturer enumerated a number of the best well-known examples. The worst art in the whole world, said the professor, was embodied in the modern school of Italian sculpture. Reticence they simply did not understand. In sculpture a greater amount of reticence had to be observed when it was related to architecture than when it stood alone. Concluding, the professor said that if the work we do be done honestly, it will be good, no matter whether it be rich or whether it be simple. On the motion of Mr. Wm. Jas. Anderson, seconded by Mr. Chas. R. MacIntosh, a hearty vote of thanks was accorded the professor for his lecture.

#### THE ARCHITECTURAL ASSOCIATION OF IRELAND.

—A meeting of the above association was held on Tuesday evening in the Grosvenor Hotel, Westland-row, the president, Mr. R. Caulfield Orpen, in the chair. Amongst those present were Mr. Albert E. Murray, R.H.A., Mr. Geo. M. Ross, M.A., B.E., Mr. Joseph Holloway, M.R.I.A.I. (vice-president), Mr. T. Slevin, C.E., Mr. M. J. Tighe, C.E., and Mr. R. Butler (secretary). Mr. W. Kaye Parry, M.A., B.E., gave a lecture on "Drainage and Sanitary Construction." The lecturer gave a most interesting account of the progress of sanitary engineering in recent years. He illustrated his remarks with a large number of diagrams. The lecture was followed with the closest interest by a large and appreciative audience. Mr. M. Tighe proposed, and Mr. Geo. Ross seconded, the vote of thanks, which was supported by Mr. Albert E. Murray, and passed with acclamation.

An altar, designed and executed by Mr. F. Curley, of Flood-street, and dedicated to St. Joseph, has just been erected in the church of Our Most Holy Redeemer, Upper Cheyne-row, Chelsea, S.W. It has been given in memory of the late Rev. Father Osborne of the London Oratory, by his cousin.

The commission to work out the provisions that are required in framing a building act for Calcutta will shortly be appointed. The Hon. Mr. Risley will be president of the commission, which will consist of twelve members.

A stained-glass two-light window has been placed in the north wall of Allesley Church, in memory of the late Mrs. James Maycock, of Coventry. The subject is one suggested by the last chapter of Proverbs, describing the virtues of "The Good Woman." At the top, under canopies of white and gold, of the Perpendicular period, are angels holding scrolls with suitable texts referring to the subject, upon ruby backgrounds. The right-hand light is occupied with a female figure, bearing a child in her arms, and holding another by the hand. The left light contains a central male figure seated, surrounded by six other figures standing. The window was designed by Messrs. Ward and Hughes, 67, Fritch-street, Soho-square, London, W.

\* Quantity Surveying, for the use of surveyors, architects, and builders, by J. LEANING. Third edition, revised and enlarged. London: E. and F. N. Spon, Strand.



## Building Intelligence.

**ABERDEEN.**—The plans of the laboratory and marine aquarium proposed to be erected to the north of the sea-bathing station have been completed for a company by Mr. Rust, City architect. The building will consist of two flats, designed in the Italian style, to harmonise with the sea-bathing station. There will be a central block, 56ft. by 40ft., and two end wings, each 32ft. by 52ft. The front elevation will be to the sea. The cost, in granite, would, it is estimated, be £6,000, and in brick £5,000.

**LICHFIELD.**—The reopening of St. Chad's Chapel on the south side of the choir of Lichfield Cathedral took place on Tuesday after restoration. The chapel was, the Dean states, "destroyed when the rest of the cathedral was laid in ruins, in 1643, the siege beginning on St. Chad's Day, March 2, of that year. Little was left; the four walls remained in a broken condition, with the vaulting shafts and caps for the springers of the stone groining, and the wall-ribs, to mark its original lines; also the very beautiful Early English windows—twelve lancets in groups of three—which, singularly enough, were little injured. Externally these are very plain, but internally they are full of interest, and there is nothing better of the kind in the cathedral. After the destruction the chapel must have been left roofless for years, as, on breaking up the floor which had been raised by some accumulation of rubbish, the workmen found roots of shrubs imbedded in it. At some time, quite unknown, the chapel was roofed in again, and the tops of the walls rebuilt where they had been broken down. A flat plaster ceiling was inserted, and, being divided into two rooms, the old chapel was filled with cupboards and used till last year for the custody of the muniments. The recess still remains in which antiquarians suppose that St. Chad's relics were preserved." All the stone groining and the wood and ironwork have been completely restored under the direction of Mr. J. Oldrid Scott. There are some pieces of old stone figure-work, which have been preserved. The new bosses and corbels have been carved with subjects from the history of St. Chad, the chief of which shows him being mounted on horseback by Archbishop Theodore; his protection of the hart that fled to him for refuge; and his death in his cell surrounded by angels. The reredos, of Staffordshire alabaster, replacing one, the existence of which at the east end is clearly indicated, has been designed by Mr. C. E. Kempe. It consists of an altar-piece of ornamental arcading, surmounted by three tall, canopied niches, in which are placed sculptured figures, representing the Crucifixion, St. Mary, and St. John. These are supported by angels bearing shields. All the windows are filled with stained-glass by Mr. Kempe, and contain choirs of angels singing the Confessor's Hymn or Psalm cxii. The stone and alabaster work has been executed by Mr. Bridgeman; the ironwork is by Mr. Culwick; both of Lichfield.

**SOUTHAMPTON.**—A music-hall, to be known as the Royal York Pavilion, is about to be built at Above Bar, Southampton. The construction will be fireproof. The roof over the stage will be of wood, with a large lantern light in the centre. The façade will be of artificial stone, and red bricks with the ornaments in sgraffito. The hall will consist of three tiers—viz., pit and stalls, grand circle, and gallery. The openings in the proscenium wall will be shut off by iron doors hung tilted so as to close of themselves. The stage will be dominated with sprinklers on the non-automatic system, and hydrants will be provided on the stage and flies. The whole of the steel construction will be incased in wire and plaster. The shops, rooms over, and the saloon at the side of the hall will be entirely shut off from the hall. The accommodation will consist of stalls 150, pit 450, grand circle 350, gallery 650, four private boxes (four persons in each) 16—1,616. Promenades about 500. The hall will be decorated in the Renaissance style. Mr. Walter Emden, J.P., V.P.S.A., of 105, Strand, London, W.C., is the architect, and Messrs. Beer and Gash, of London, are the contractors.

The city council of Coventry elected, on Tuesday, Mr. J. E. Swindlehurst, at present borough surveyor of Burton-on-Trent, as city engineer and surveyor, at a salary of £500 a year.

## COMPETITIONS.

**BLOWICK.**—In a limited competition for a new Wesleyan church at Blowick, near Southport, the designs of Messrs. Green and Brockbank, Adelphi Bank Chambers, Liverpool, have been placed first and accepted. The church will cost about £3,500, and will be built of brick with stone dressings.

**SPALDING.**—A special meeting of the Urban District Council was held last week for the consideration of the eight plans sent in for the enlargement of the Corn Exchange and Butter Market in response to a premium of fifteen guineas. The choice of the council lay between two signed "F.B.O." and "Old and New." The proposal in each case was to carry the Exchange Hall, with stage and retiring rooms, right through to the extremity of the council's property to Double-street, and to enlarge the butter market by extending it underneath the Exchange, the floor of the hall being raised 2ft. to allow of that. The estimated cost in each design lay between £1,900 and £2,000. After discussion, it was resolved by a practically unanimous vote to accept the plans signed "F.B.O.," and those proved to be by Mr. J. B. Corby, of Stamford. A committee was appointed to confer with the architect (who will have the control of the work) as to a number of points of detail. The plans placed second, contributed under the motto "Old and New," were by Mr. C. A. W. Smith, of Grantham. The work will be put in hand as early as possible, so that the Exchange may be ready for use after harvest.

**WALTHAMSTOW PUBLIC BATHS.**—The award of the assessor appointed by the District Council (Mr. Rowland Plumbe, F.R.I.B.A.), is as follows:—First, "Hygiene" (Mr. J. Williams Dunford, M.S.A., F.I.Inst., 100c, Queen Victoria-street, E.C.); second, "Experience" (Messrs. Spalding and Cross). The District Council have appointed Mr. Dunford their architect, subject to the plans being approved by the Local Government Board.

In the Parliamentary Estimates for public works and buildings now under consideration, so as to expedite the construction of block 2 of Messrs. Leeming and Leeming's new Admiralty Buildings, a sum of £40,000 is asked, as against £25,000 in 1896-97. An increase of £25,000 for Public Buildings, Great Britain, is due mainly to the Patent Office extension, the New Record Office, and the extension of the General Register House, Edinburgh. Under the surveys estimate, which shows a net increase of £7,151, increased provision is sought for the revision of the 1in. map of Great Britain, and for employing outside contractors to assist in engraving maps.

Mr. W. Hamilton Dalrymple, of North Berwick, writes protesting against the Vandalistic determination of the corporation of that borough to demolish the old Town House, and erect on its site a suite of new municipal buildings. The old Town House in Quality-street, with its little clock tower and outside stair, is, he remarks, a feature in one of the most picturesque streets in Scotland, and its destruction will be deeply regretted by all lovers of beauty and the majority of the inhabitants in this place. If a new public building is needed, he says that, at all events, a fresh site should be chosen, and the present edifice utilised for some other purpose.

The Bishop of Winchester recently officiated at a dedication service at the re-opening of Hale Church, Farnham, which has been enlarged, additions being made as a Jubilee memorial on plans by Sir A. Blomfield, A.R.A. These include a new transept, which has been erected over the tomb of Bishop Sumner, who consecrated the church in 1844, and was interred on the south side of the chancel.

At a meeting of the congregation of Carr-lane Chapel, Birmingham, it was decided to alter and improve that edifice at a cost of £5,570, towards which over £1,800 was promised in the town. It was stated that since 1863 over £14,000 has been expended in decorating, lighting, heating, and structural alterations to the edifice.

On Wednesday evening in last week, an ordinary meeting of the York Architectural Society was held in the Church Institute, Lendal, Mr. G. Benson presiding. Mr. Arthur J. Penty read a paper entitled "Haddon Hall." The mansion was regarded as a monument of architecture, its charm being in its purity of style and its simplicity of treatment. When the craftsmen of that date were compared with the modern builder, we realised how much we had lost—the latter working and living for utilitarianism alone. The lecture was illustrated by measured drawings and sketches (made by Mr. Penty) and by lantern views.

## Engineering Notes.

**LYNTON AND BARNSTAPLE RAILWAY.**—The construction of this line is being rapidly proceeded with at both ends, and the opening will take place in July next. The Barnstaple section as far as Chelham, a distance of about five miles, is now practically finished. At Chelham the line rises to a height of 74ft. above the valley beneath, being carried by a viaduct, which has been informally opened. The immediate advantage of the completion of the viaduct is that trucks will be enabled to be brought through from the other side with the "deads," which may be wanted for filling up purposes at the Barnstaple terminus. The viaduct is about 74ft. high, is 400ft. long, and has eight semi-circular arches of 45ft. each, and seven piers. Its width on the top is 13ft. Later on a parapet wall will be built on each side of the viaduct. The structure is of white brick, and the cost of this portion of the work has been about £6,500. The total length of the railway from Barnstaple to Lynton is 19½ miles.

## CHIPS.

A private Metropolitan railway Bill of some importance has been withdrawn this week by the promoters. It is the measure known as the West Suburban Railway Bill, which proposed to incorporate a company for making a railway from Praed-street, Paddington, to Willesden, of the length of four-and-a-half miles, and which was to be worked by electricity or cable power.

The convalescent home, St. Anne's-on-the-Sea, is being warmed and ventilated by means of Shorland's patent exhaust roof-ventilators and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A new board school was opened at New Park, Bolton, near Knaresborough, last week. It accommodates 520 children, has a central hall with classrooms, infants' room, and cookery-room grouped. The outlay has been £6,100. Messrs. Illingworth, Ingham, and Co., of Leeds, supplied the school furniture.

At a meeting of the directors of the Invergarry and Fort-Augustus Railway Company, held recently, the various tenders for the construction of the line were considered, and it was agreed to accept the tender of Mr. James Young, contractor, Glasgow. One of the special conditions of the contract to which the successful contractor agreed is that the works are to be completed and the line opened by 31st March, 1899. The first sod will be cut on Tuesday next.

The report of the Surveyors' and Auctioneers' Clerks' Provident Association shows that advances continue to be made both in the annual income and in the accumulated funds. The annual premiums are now £206, as compared with £185 a year ago. The funds generally show an increase, the sick allowance payments have been less, and the working expenses show a decrease. There are 111 members.

Nearly 200 guineas have already been subscribed to the fund for a bust of the late Lord Randolph Churchill to be placed in the precincts of the House of Commons. The execution of the bust will probably be intrusted to Mr. Story, who is now engaged upon a large statue of Lord Randolph for Blenheim Palace. When completed the bust will probably be placed in one of the niches of the members' staircase, near to that of the late Mr. W. H. Smith.

Messrs. Hickton and Farmer, of Walsall, have been appointed architects to the Wollacote School Board, and have been directed to prepare plans for that board for the building of an infant school for 400 scholars.

The parish church of Gaerwen, Anglesey, is about to be restored, from plans by Mr. E. Shearson Gregory, of Bangor, diocesan architect.

At Reading Grammar School, last week, a new physical laboratory was formally opened. It has been erected from plans by Mr. Ravenscroft, of that town, and, with the new chemical laboratory, opened a short time since, completes the group of buildings at the school.

The driving of the heading through the tunnel at Culver, on the Exeter, Teign Valley, and Chagford Railway was completed on Monday, when the final blasts were made by two ladies, who accepted the invitation of the contractors (Messrs. James and John Dickson) to fire the last charge. The heading is practically 1,000ft. in length. It has taken about five months to drive. The piercing of the large tunnel through the Haldon Range at Pertridge is also very near completion, and the last shots will be fired one day next week by the Mayoress of Exeter.



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ILLUSTRATIONS.

THE DRAWING-ROOM AT BRAMHALL HALL, AFTER J. NASH.—ST. GABRIEL'S CHURCH, PIMLICO.—NEW HOSPITAL AT HALIFAX.—RELICS OF OLD LEEDS.—ST. MICHAEL'S CONVALESCENT HOME, WESTGATE-ON-SEA.—RESIDENCE AT CHICAGO.—OAK SIDEBORD FROM AN OLD FARM HOUSE NEAR BLACKBURN.

Our Illustrations.

THE DRAWING-ROOM, BRAMHALL HALL, BY JOSEPH NASH.

FROM the collection of Mr. William T. Oldrieve, of H.M. Office of Works, kindly placed at our disposal by the owner, we give this week another of Joseph Nash's illustrations of this famous Cheshire mansion, showing the drawing-room. Other views from the hall were published in the BUILDING NEWS for Jan. 13, 1888, Oct. 2, 1896, and the 12th ult.

ST. GABRIEL'S CHURCH, PIMLICO.

THESE designs illustrate the alterations and additions to this church, which were dedicated by the Bishop of London on Monday last, and which consist of the removal of the side galleries, the erection of new north and south aisles, a new south chapel, a west gallery, and a west porch. The church is lofty and well-proportioned, and a good specimen of the Early Gothic revival. The interior, which was not a little disfigured by the unsightly side galleries, has been much improved by their removal, and by the added space and picturesqueness given by the new aisles, as well as by the groining of the roof of the aisles, and by the richly-carved oak front of the west gallery carried on a stone arcade. The work has been executed by Mr. John Thompson, of Peterborough, from the designs of Mr. Arthur Baker, F.R.I.B.A., of the firm of Messrs. Baker and Furvell, and the carving by Mr. Robert Bridge-man, of Lichfield.

PROPOSED HOSPITAL FOR THE HALIFAX UNION.

SOME three years ago the Local Government Board made certain recommendations in connection with the existing workhouse and hospital for the provision of more room in each section, while, at the same time, requiring the removal of a number of buildings on the site to obtain an enlarged air-space. After some delay in inquiries it was decided to build an entirely new hospital away from the workhouse, and a site of 12½ acres was obtained about a mile out of Halifax. Plans have been prepared for a completed hospital scheme for 642 beds, consisting of two circular pavilions, light oblong pavilions, and two maternity pavilions. It is intended, however, to build at first for 394 beds, in wards, and this will be accomplished by omitting two oblong pavilions on each side, and furthest in the picture of hospital herewith. The whole of the administrative block, electric centre, boiler-house, laundry, mortuary, and stabling is included in the first undertaking, the amount of contracts let being about £93,000, and the total cost when completed is estimated to be £125,000. It is in-

tended to utilise electricity largely. The whole of the hospital lighting will be electric; hoists and lifts, ventilation, and hot hearths will be worked by electricity, Messrs. Shepherd and Whatney, of Albion-street, Leeds, being the electrical consulting engineers, and Mr. W. Clement Williams, F.R.I.B.A., of Halifax, is the architect for the buildings. The following is a complete list of the contractors:—Mason, Mr. Edwin Naylor; joiner, Mr. Joseph Hanson; plumber, Mr. Thomas Boocock; plasterers and slaters, Messrs. Rushworth and Firth; painters, Moss Brothers; iron railing, Messrs. B. Hirst and Son (all of Halifax); steel work, Messrs. Dooman, Long, and Co., Middlesbrough; wood-block flooring, the Wood Block Flooring Company, London, the same firm taking the contract for concrete and fireproof flooring.

RELICS OF OLD LEEDS.

RECORDS of the kind just published by Mr. Percy Robinson, of Leeds, merit more than merely a local support, as year by year the few remaining relics of our greater cities are gradually and certainly passing away; indeed, in the ordinary course of municipal improvement of all kinds, the demolition of these old landmarks and historic buildings is inevitable, even where the authorities exercise a befitting care for the architectural character of the streets under their control. Speculators, too, ever on the look-out for eligible "developments" seldom permit considerations of an artistic nature to weigh in the balance against financial possibilities. Thus, in a variety of ways, the class of houses which, from their old-world associations, if not for their actual beauty, always possess the greatest interest for cultivated minds, are being improved out of existence. To permanently preserve in a handy form for reference accurate reminiscences of such relics of the past as these may not prove exactly a lucrative undertaking, but it is nevertheless a manifestly pleasurable duty, well-deserving of recognition by municipal bodies and all who value architectural art. We accordingly direct our readers' attention to the volume under the above title, and from whence the accompanying illustrations were reduced by permission from the publisher. These old bits of domestic work comprise a house, Low-road, Hunslet; Knostrop Old Hall, and Carr Hall, Hunslet. Of the first, a pre-Jacobean example, little is really known historically. The premises are divided into two tenements, one being used as a lodging-house. Carr Hall was built possibly by the Fentons, and at the beginning of the present century Mr. Armistage, the last of the old handspun and hand-worked cloth manufacturers, occupied the hall. In the large mullioned window seen in the sketch there are remains of stained glass. Knowles-thorpe, or Knostrop Old Hall, was built about 1620, and Stables, the Quaker, possessed the place in the Commonwealth, when he converted part of the orchard into a burial-ground, and interred his children there. Whitaker says the house contains, perhaps, the latest specimen of a dais, or raised step for the high table, which is to be found in England. The entrance gateway is uncommonly picturesque, with stone-armed seats. The interior has been modernised, though the oak staircase remains. These sketches are but samples, and all have letterpress particulars. Mr. Percy Robinson issues the book in Leeds, and Mr. B. T. Batsford does so in London.

ST. MICHAEL'S CONVALESCENT HOME, WESTGATE-ON-SEA.

ST. MICHAEL'S CONVALESCENT HOME, at Westgate-on-Sea, Thanet, is in course of erection for the London Diocesan Deaconess Institution, Westbourne Park, the foundation-stone having been laid by Lady Halsbury, who has been a munificent contributor to the building fund. It is designed to accommodate forty convalescents—twenty men and twenty women—in separate wings, on either side of the central block, in rear of which are placed, in a one-story building, the dining-hall and kitchen offices. The home, situate facing the junction of the Donneva and Elm Grove roads, is of stock brickwork, with red brick dressings, and green slate roofing. The staircases are of Stuart's granolithic. It is in contemplation, when funds permit, to complete the scheme by the addition of a chapel, as indicated in the illustrations. Messrs. Johnson and Co., contractors, of Watling-street, are carrying out the work from the designs, and under the superintendence of, Mr. Frederick Mew, of Gordon-street, W.C.

RESIDENCE AT CHICAGO.

ACCOMPANYING our illustrations this week will be found a sketch of the above American house, designed by Mr. F. R. Comstock, architect, of Hartford, Connecticut. On Dec. 11 and 25 last we illustrated other work by the same hand. There is much picturesqueness in the design published to-day, and effect is gained by the treatment of the steeply-pitched roofs, while the fenestration is more elaborate than is usual in this country.

OAK SIDEBORD.

THIS piece of furniture is in an excellent state of preservation, having been apparently taken great care of. With the exception of a few joints on panels, and bruises incidental to its possible peregrinations, it is in very good condition. The carving is exceptionally good, but I have failed to render the quaint feeling it has. That in the frieze is rather crude, being only slightly incised and stamped. The piece is a rich dark brown colour, not at all like the almost black examples of old oak woodwork we come across. In the bottom carcase a shelf runs the full length, divided into two cupboards. The muntins in lower doors are moulded on each edge and have mouldings on the face, all finishing on splayed edge of bottom rail. The back to upper part is V-jointed, tongued and grooved, and may possibly be modern. I came across the sideboard at a farmhouse near Blackburn, and have the authority of the owner for saying that it is a genuine old piece, having been handed down in his family for many generations. FRED L. WHITESIDE.

ROYAL ACADEMY DRAWINGS, 1897.

THE days for receiving drawings at Burlington House this year are fixed for Friday, Saturday, Monday, March 26, 27, and 29, the sculpture to be sent in on Tuesday, March 30. We shall be happy to receive and deliver architectural and decorative designs and drawings, but the labels must be attached to the frames, and the necessary letter to the secretary of the Royal Academy must accompany all contributions so sent. The carriage also to our office should be prepaid. The earlier drawings reach us the better, and our reproductions of accepted works will appear after the opening of the galleries in May. Every care will be taken of drawings intrusted to us, and it is our intention to make our reproductions as thoroughly representative as possible, and the best of their kind procurable.

CHIPS.

The late Miss Elizabeth Burman, of Birmingham, has bequeathed large sums to local charities, and also £3,000 for the purpose of rebuilding the nave and chancel of St. Patrick's Church, Salter-street, Hockley Heath; and £300 for a stained-glass window in the parish church of Tamworth.

Lord Wimborne, the Mayor of Poole, has offered the corporation as a free gift the house and grounds known as Poole Mansion, to be used for ever as a hospital. He proposes that an endowment fund be started, and offers to head it with £1,000, making his offer worth £6,000. The corporation have heartily approved of the scheme.

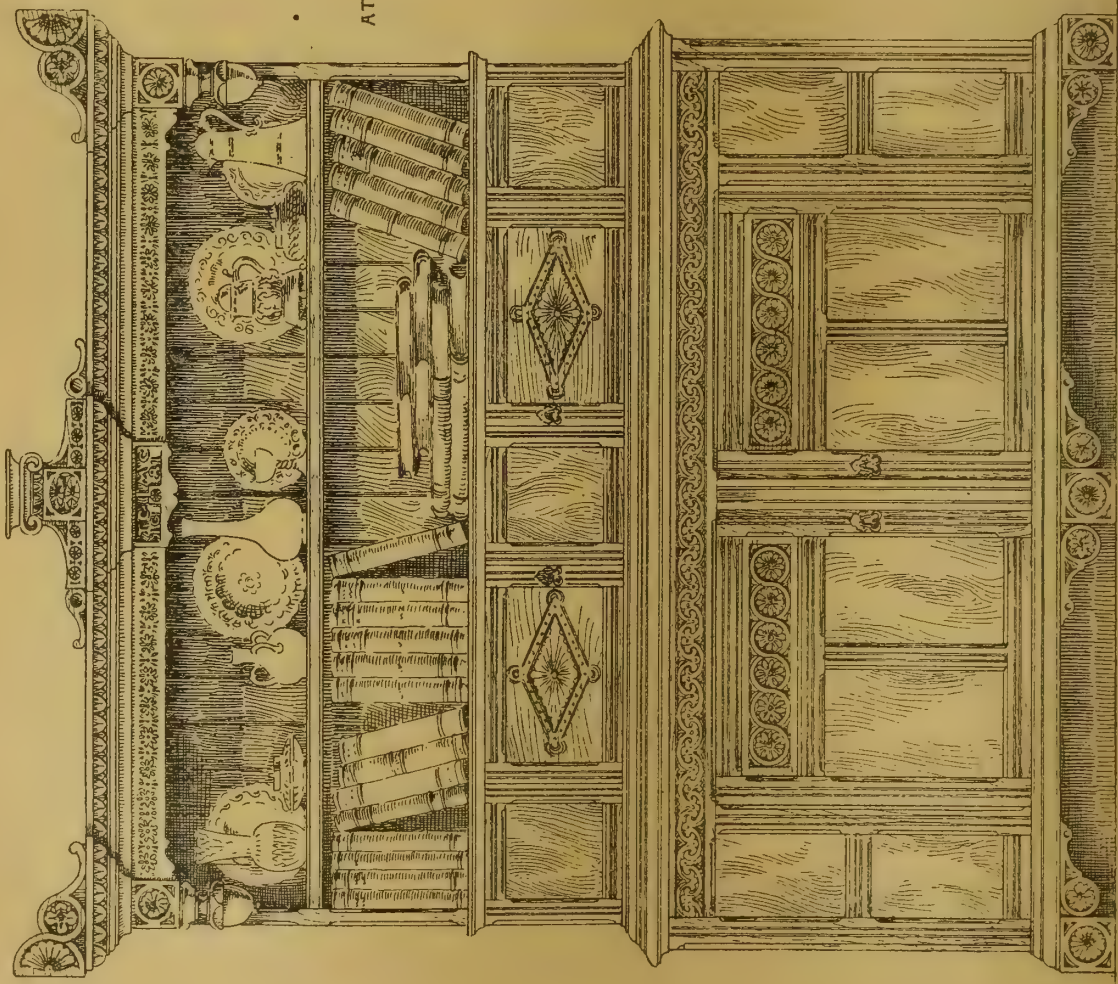
Duty has been paid upon £107,169 6s. 3d. as the personal estate of the late Mr. Robert Warner, of Widford Lodge, Chelmsford, bellfounder. The bequests are all to members of testator's family, the residuary legatees being his grandchildren.

The town council of Leicester have decided to seek powers to borrow £68,000 in order to enlarge the borough lunatic asylum at Humberstone. It is proposed to rebuild the administrative block and recreation hall on an enlarged scale, and to add a wing for 350 patients.

The Mersey Docks Board, who a year ago resolved to erect new tobacco warehouses, at a cost of £170,000, now find the requirements of the port in excess of the provision contemplated, and decided on Friday to increase the expenditure to £250,000, so as to store 55,000 hogsheads of tobacco. The warehouse will be 723ft. by 163ft., with twelve floors.

The contract for the reconstruction of the Red-hugh Bridge, between West Newcastle and Gateshead, has been let. The successful tenderer is the firm of which Sir W. Arrol is the head. The time in which the contract is to be executed is about two years; and the amount of the contract is roundly about £80,000. The Bridge Company have posted notices explaining that the bridge will not be closed to foot passengers during the reconstruction.





• OAK SIDEBOARD.  
DATED 1681.  
AT A FARMHOUSE N<sup>o</sup> BLACKBURN.

• FRONT ELEVATION •



• SIDE



Designed & drawn by  
Charles Litchfield 1897

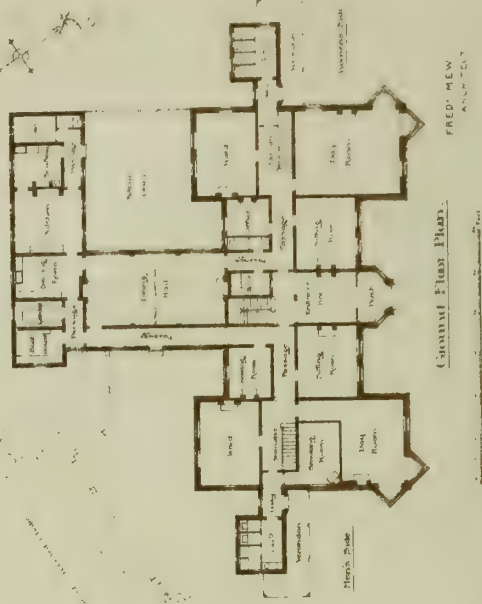






THE BUILDING NEWS, MAR. 5, 1897.

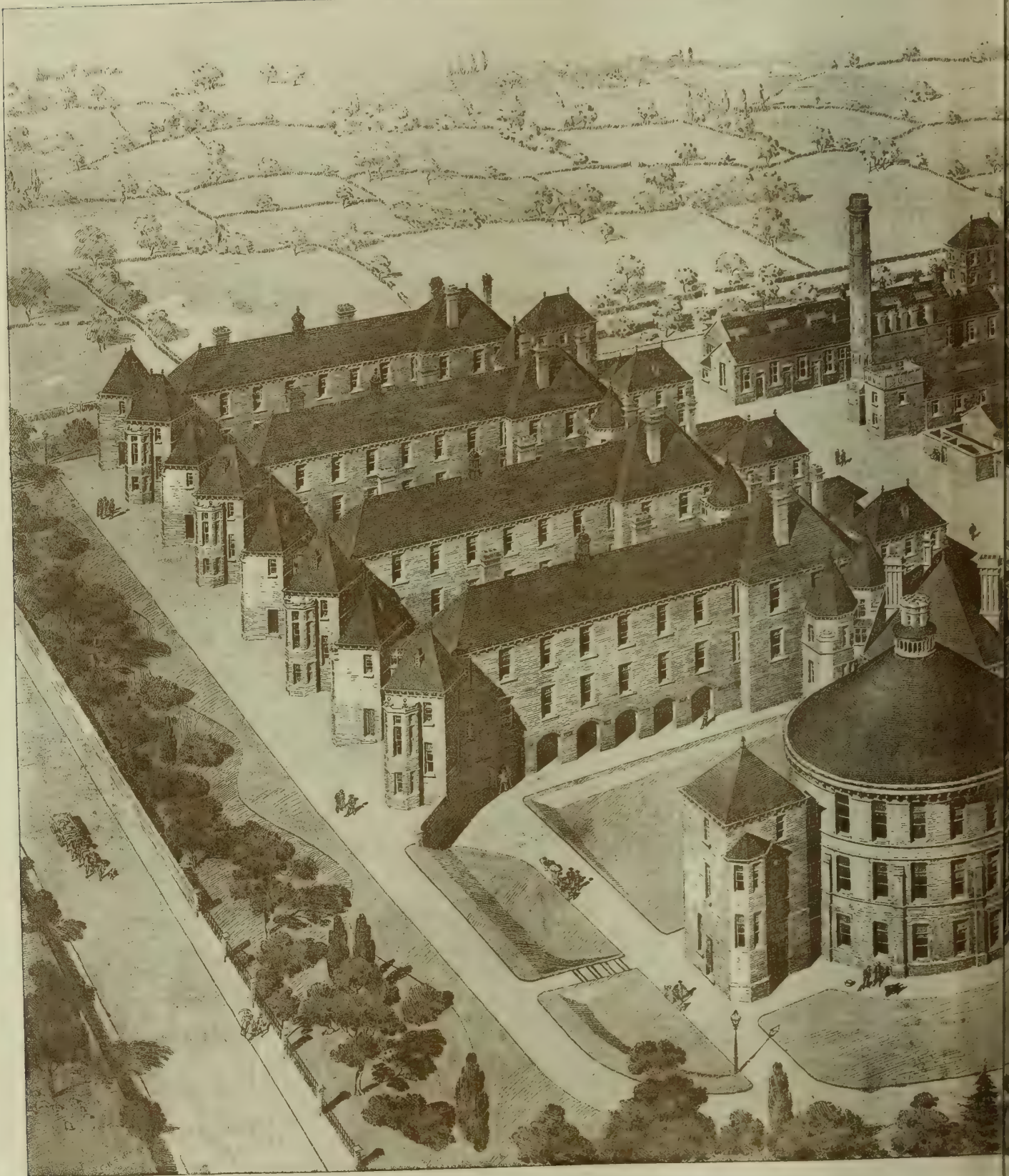
ST MICHAEL'S CONVALESCENT-HOME WESTGATE-ON-SEA. FRED<sup>K</sup> MEW ARCHT.











NEW HOSPITAL HALIFAX



This is a detailed, sepia-toned aerial illustration of a large, historic university campus, likely the University of Cambridge. The image shows a dense cluster of large, multi-story buildings with red-tiled roofs and white walls, featuring numerous windows and chimneys. A prominent circular building with a domed roof is visible on the right side. The campus is surrounded by green lawns, trees, and a winding path. In the foreground, a large, ornate building with a gabled roof and a central entrance is visible. The overall scene depicts a well-maintained and historic academic environment.

WORKS · W CLEMENT WILLIAMS FRIBA ARCHT





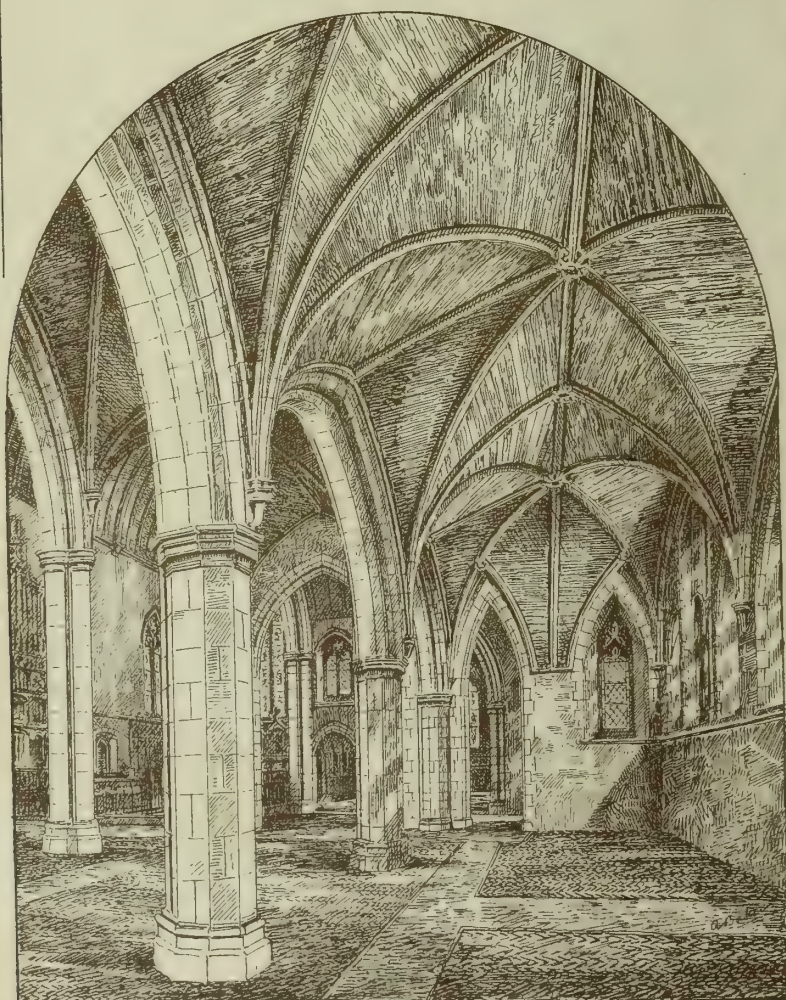




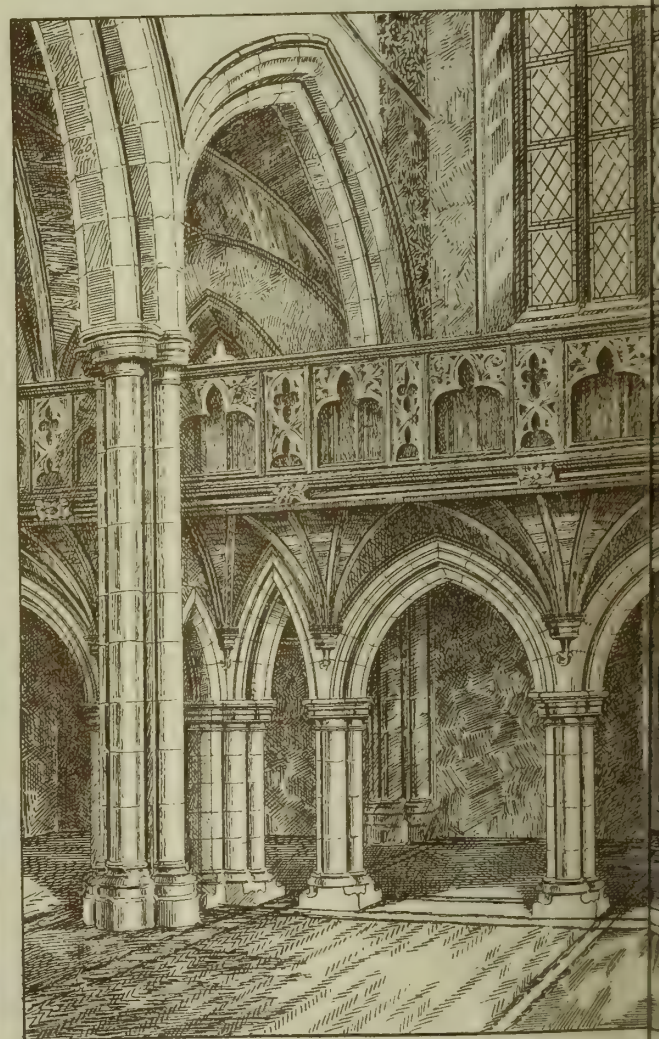




VIEW OF NEW SOUTH AISLE AND MORNING CHAPEL.

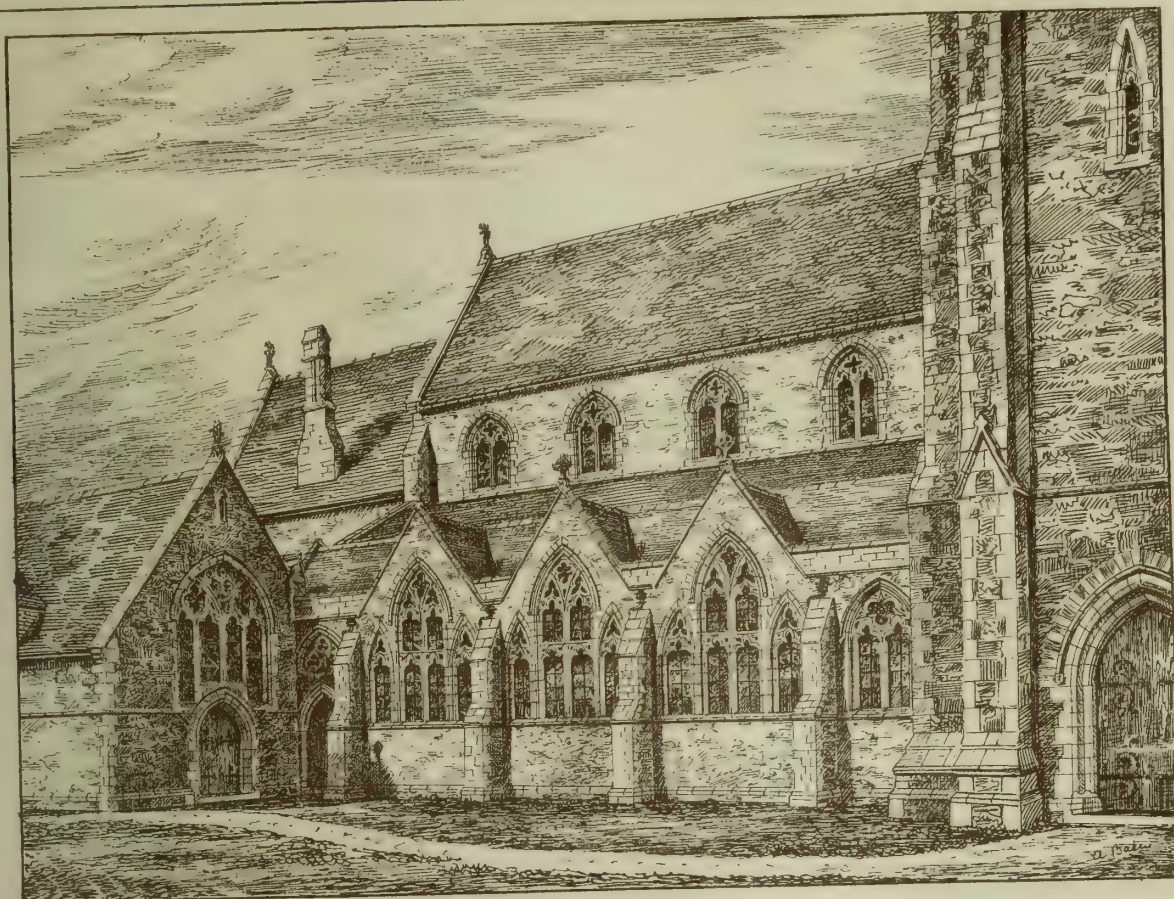


VIEW OF NEW SOUTH AISLE (WITH GROINED CEILING) LOOKING EAST.

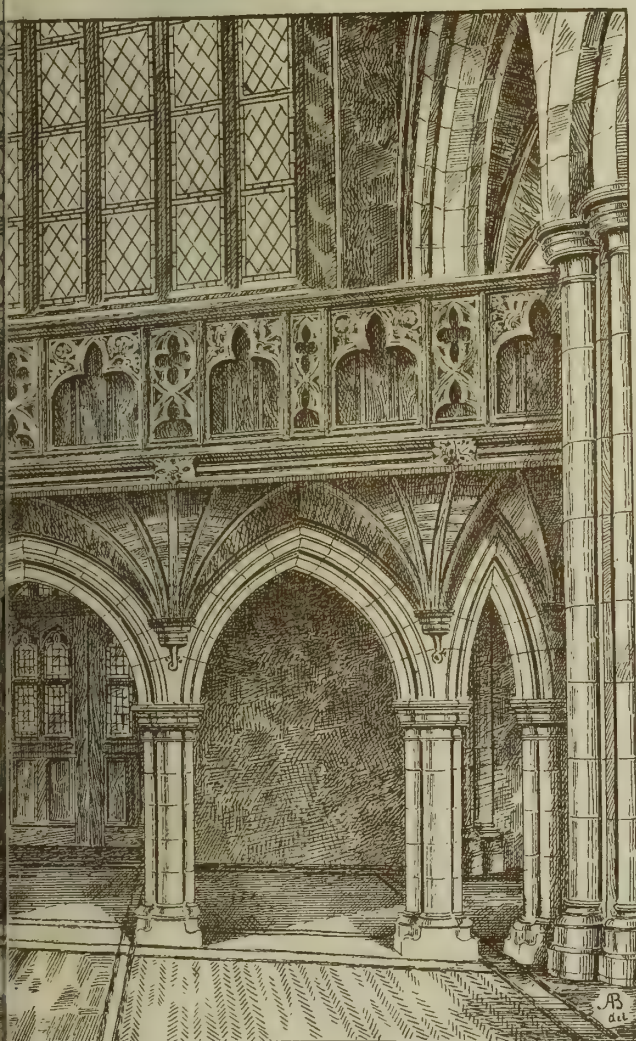


— NEW WEST

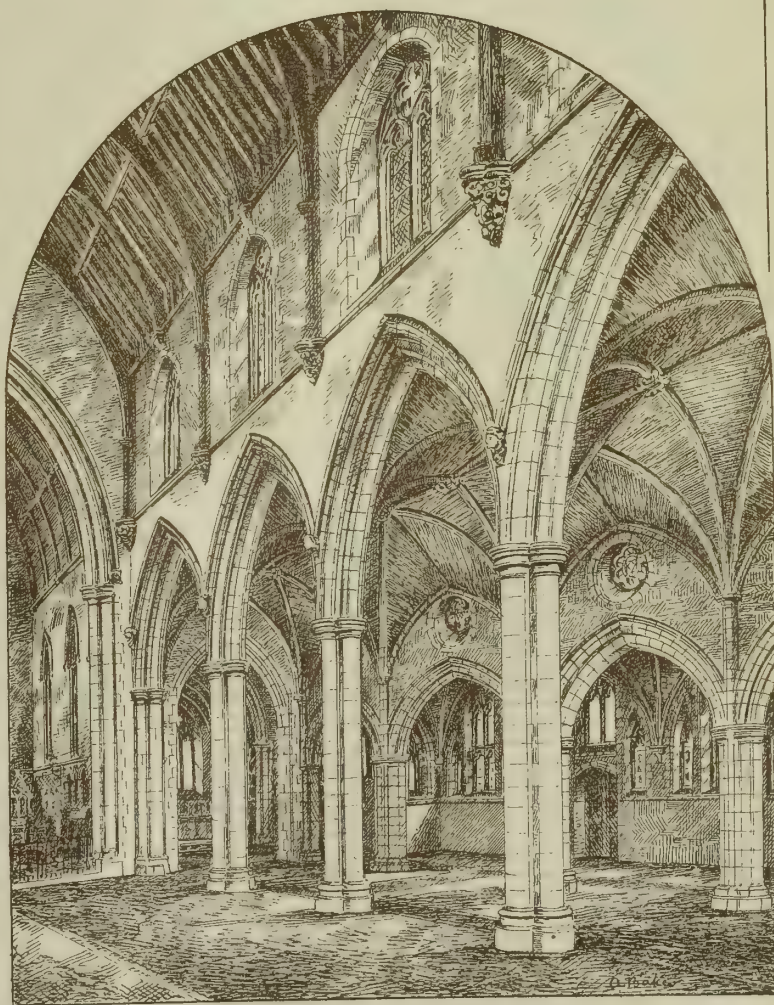




*VIEW OF NEW NORTH AISLE.*



*GALLERY. —*



*VIEW OF SOUTH AISLE WITH GALLERY REMOVED, & NEW SOUTH AISLE (WITH CEILING GROINED)*













FROM THE COLLECTION OF M<sup>RS</sup> W. T. OLDRIEVE.

BRAMHALL HALL CHESHIRE



MAR. 5. 1897.



"PHOTO-TINT" by JAMES AMERICAN • 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

THE DRAWING ROOM AFTER J. NASH.







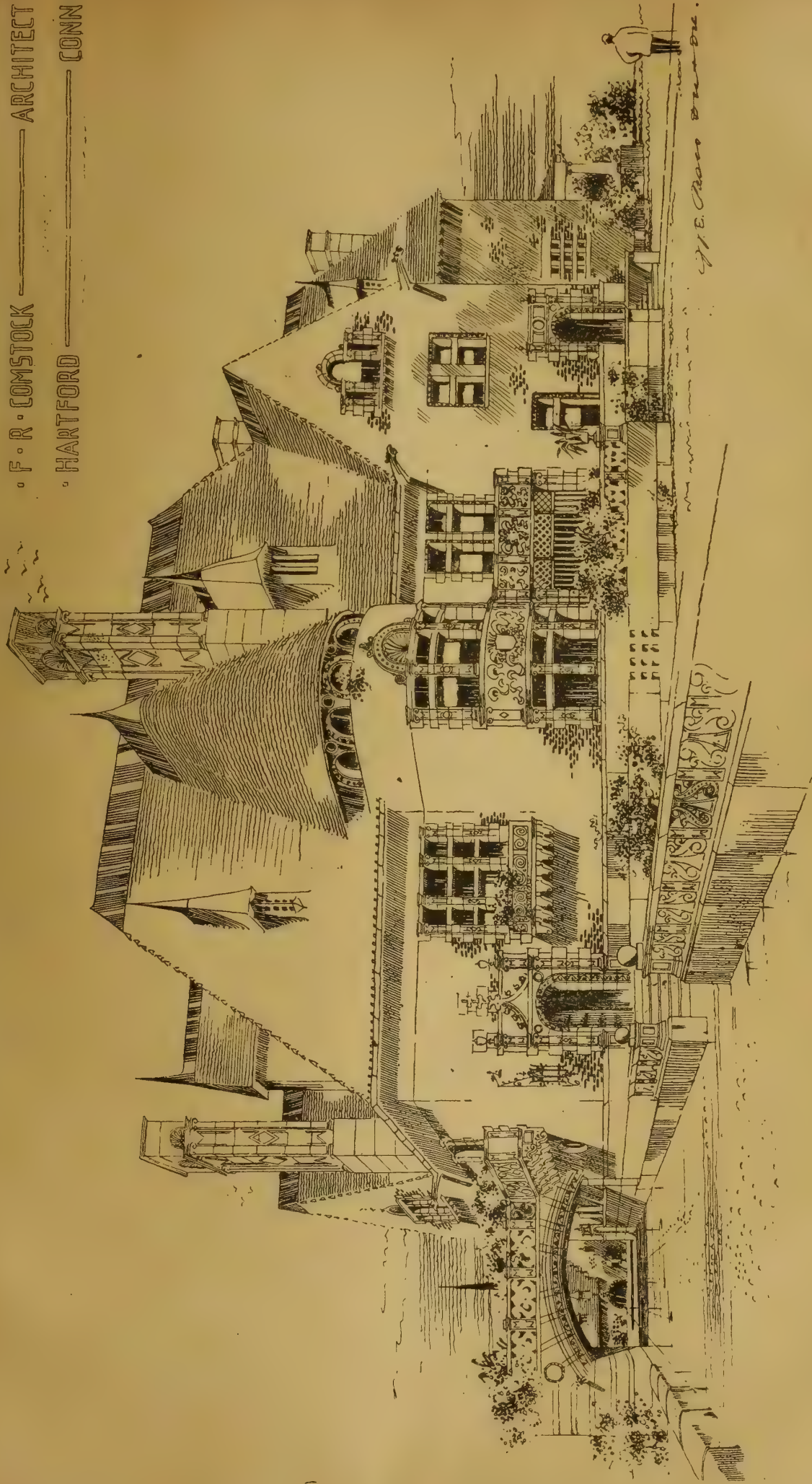








RESIDENCE FOR MR. \_\_\_\_\_  
CHICAGO \_\_\_\_\_ ILLINOIS \_\_\_\_\_  
F. R. COMSTOCK \_\_\_\_\_ ARCHITECT \_\_\_\_\_  
HARTFORD \_\_\_\_\_ CONN. \_\_\_\_\_





## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 6s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. W. and J. M.—A. O. C.—M. H. W. Co.—R. T. L. and Co.—M. A.—E. S. (Penge).

S. G. (The other views of Peterborough Cathedral to which we referred last week when illustrating the west front, are published by the Autotype Company, for whom they were all taken by Mr. Scriven. We are glad you so warmly approve our reproduction of their excellent autotype of the great facade now being restored.)

## Correspondence.

## NEWPORT HOSPITAL.

To the Editor of the BUILDING NEWS.

SIR,—In your notice of the above in to-day's BUILDING NEWS, you state that my plans have been adopted, but that the plans of a Mr. Snell were placed first. This apparently is a clerical error; but it may perhaps give a wrong impression to your readers, and lead them to suppose that, although one gentleman's plans were placed first, another's were adopted. This is not the case. My plans were placed first, and received the first premium; and they have since been adopted unanimously by the Board, and I have been appointed architect for the building.

Will you kindly make this correction in your next issue?—I am, &c., RICHARD J. LOVELL.

46, Queen Victoria-st., London, E.C., Feb. 20.

The town council of Wrexham have decided to commemorate the Queen's sixty years' reign by building a town-hall.

The Edinburgh Architectural Association, by permission of the directors, visited the North British Distillery on Saturday afternoon. The head brewer, Mr. S. Stevenson, conducted the party over the buildings, which occupy about eleven acres of ground, and have about sixteen acres of floor space. Henning's pneumatic drums were shown at work, and the various processes to which the grain is subjected were followed, from the grain stores to the still-house.

## Intercommunication.

## QUESTIONS.

[1630.]—**Black Clocks.**—Having some property that is very much troubled with black clocks, I should be glad if any of your numerous readers could tell me the best means of destroying them?—R. A., B.

[1631.]—**Flooring.**—Is there any good prepared flooring imported from Petersburg or from the White Sea ports, such as Onega and Archangel? If so, would correspondents kindly favour with particulars?—H. K.

[1632.]—**Architect's Level.**—What is the size, price, and kind of levelling instrument generally used by architects? Is the small kind known as a contractor's level sufficient for the ordinary requirements of an architect and surveyor?—X.

[1633.]—**Adjoining Owners.**—I shall be glad to be informed of any legal enactments affecting the relations between building and adjoining owners of party-walls in districts outside the metropolis?—A. H. P.

## CHIPS.

A Local Government Board inquiry was held at Radcliffe, Lancs, on Friday, by Mr. Meade-King, respecting the urban district council's application to borrow £5,000 for the erection of public baths. Mr. W. L. Rothwell, surveyor, produced and explained the plans.

The 13th annual exhibition of the Home Arts and Industries Association will be held at the Royal Albert Hall from May 20 to 24. H.R.H. the Princess of Wales, whose classes at Sandringham will exhibit, has signified her intention of visiting the exhibition.

It is proposed to build a coffee-house and assembly-room for Earlsdon, Coventry, from plans by Messrs. Harrison and Hattrell, architects, of Hertford-street, in the latter city.

Under the auspices of the architectural section of the Philosophical Society of Glasgow, Dr. Neil Carmichael read, on Monday evening, a paper on "Home Sanitation." He dealt with aspect, foundations, soil, drainage, ventilating, lighting, and heating in their relation to health.

The Chippenham Town Council having applied to the Local Government Board for sanction to borrow £6,300 for works connected with water supply. An inquiry was held at the town hall on Friday by Mr. W. A. Ducat, an inspector from the Board.

At a meeting held at Kirkley last week, Col. Lucas, deputy mayor of Lowestoft, and a large shareholder in the Great Eastern Railway Company, stated that before very long there would be a line on the south or Kirkley side of Lowestoft bridge, continuing to Kessingland, with the object, as the neighbourhood extended, and the traffic justified, of going through Southwold, and probably to Saxmundham. This might be carried out in about three or four years' time.

A public inquiry was held at Sidmouth, on Wednesday week, by Colonel W. A. Ducat, Local Government Board inspector, for the purpose of hearing an application by the urban district council to borrow the sum of £5,000 for sewerage works connected with the outfall, a previous sum of £3,800 having been granted for relaying the sewers in the town. The works will be carried out from plans prepared by Mr. James Mansergh, C.E., of Westminster.

The Roman Catholic church of St. Joseph, at Derby, which has been built at a cost of about £3,500, was opened by Cardinal Vaughan on Friday.

At a meeting of the Wakefield Rural District Council, on Friday, the clerk was instructed to apply to the Local Government Board for sanction to borrow £1,000 for works of water supply for Crigglestone.

The Duchess of Connaught laid, on Monday, at Aldershot, the foundation-stone of a new hospital for the wives and children of the soldiers of the Aldershot Garrison. The building, which is to have 11 wards with accommodation for 45 beds, is situated close to the Cambridge Hospital. On the same day the Duke of Connaught opened new church rooms, built at a cost of £1,300, in connection with St. George's Church, Aldershot.

St. George's Church, Wellington-road, Heavily, Stockport, built at a cost of about £60,000, from designs by Messrs. Austin and Paley, of Lancaster, was consecrated on Feb. 25. Late Decorated in style, the church consists of nave 112ft. by 29ft. and 50ft. 6in. high to wall-plate, north and south aisles 19ft. 3in. wide and 31ft. high to wall-plate, chancel 68ft. long by 28ft. 6in. wide and 50ft. 6in. high to plate and transepts. At the crossing of nave, transept, and chancel is a central tower 112ft. in height, surmounted by a spire which rises to a height of 230ft. from the ground. There is a peal of ten bells. Messrs. Thornton and Sons, of Liverpool, carried out the masonry, and Mr. Hindmarsh, was the clerk of works.

## WATER SUPPLY AND SANITARY MATTERS.

KNARESBOROUGH, YORKSHIRE.—An inquiry was held at the urban council offices at Knareborough, by Colonel Luard, R.E., one of the Local Government Board engineer inspectors, as to the application of the Knareborough Urban District Council to borrow a further sum of £1,800 for the completion of the main outfall sewerage and sewage disposal works, the total cost of which amounts to £10,000. The engineer, Mr. D. Balfour, M.I.C.E., F.G.S., of Newcastle-on-Tyne, explained the scheme, which consists in the laying of two main outfall sewers, both 18in. in diameter, with a total length of four miles, crossing under the River Nidd by a cast-iron inverted siphon. The disposal works consist of 10 acres of excellent porous land, properly underdrained and laid out on the intermittent filtration principle. The sewage, on reaching the site, is treated in a chamber with alumino ferric, and, after being thoroughly self-admixed, passes into large precipitation tanks in duplicate, the clarified sewage afterwards passing on to the land. There was no opposition to the scheme.

Lord Overton has bought the square of ground at Dumbarton known as College Park from the railway companies, and has formally intimated to the county council and Dumbarton Town Council that he will make over the ground to them for the purpose of their building thereon county buildings and municipal buildings respectively. The site is the best that could be had for the objects named.

Audlem, near Nantwich, will commemorate the Diamond Jubilee by erecting a market hall and town-hall by public subscription. Plans, prepared by Messrs. Hickton and Farmer, of Walsall, have been provisionally approved by the parish council, the approximate outlay being £1,600.

A fire broke out on Saturday morning in the timber works of Messrs. Beecroft and Wightman, in Harris-street, Bradford. The damage done will amount to at least £80,000.

The annual dinner of the Margate branch of the Amalgamated Society of Carpenters and Joiners was held on Saturday evening at Lilley's Arcadian Hotel. The company numbered nearly 90. Mr. H. Bishop occupied the chair, and was supported by the Mayor of Margate (Alderman E. Maltby), Alderman J. Coleman, Councillors W. H. Hughes, T. J. Carter, G. S. R. Rolfe, and J. Hosking, Messrs. H. Holborn (president of the branch), T. S. Lawrence (secretary), and F. Castle (treasurer).

According to the *Newcastle Leader* there is quite a boom in the building trade at Hexham at the present time. New streets are springing up on all sides at the west end of the town, and for all the new houses there appears to be a good demand. On the other side of the river, however, outside the heavily-rated area of the urban district, a start has not yet been made with any building operations on the slopes of the Sandhoe estate. Priestopple, in the direction of the auction marts, is now studded with banks. Two buildings are just approaching completion in that street, and branches have also been established there by two other firms.

At the last meeting of the Margate School Board a sharp discussion arose on the proposal to pay Mr. R. Dalby Reeve £65 as the balance of his fees as architect for a new school, and Mr. J. Salmon Quilter, of London, £52 10s. as quantity surveyor. A member stated that Mr. Reeve insisted on retaining the plans he had prepared, and moved that the cheque in his favour be not signed until they were delivered to the Board. Dr. Elliott protested against the covert threat conveyed in the resolution, and said if the architect had done the work he ought to be paid for it, and the matter of the ownership or possession of the plans ought to be a different question altogether. If the Board was legally entitled to the plans, no doubt they would be able to get them without difficulty. The chairman opposed the proposition as not honourable on the part of a public body; but it was carried by five votes to three.

The Prince of Wales presided on Friday at a meeting of the general committee of the Archbishop Benson Memorial Fund, held in the Church House, Westminster. It was stated that in all £1,492 had been collected, and a report of the executive committee was adopted recommending that £2,500 be set apart for a monument in Canterbury Cathedral (to be designed by Mr. T. G. Jackson, R.A., the effigy upon it to be entrusted to Mr. Thomas Brock, R.A.), and the balance devoted to some definite portion of Truro Cathedral. Leave has been granted for the removal of the body of the late Archbishop of Canterbury from its present place of interment in a vault in the nave of Canterbury Cathedral to the crypt. A new tomb is to be constructed in the undercroft immediately beneath the tomb of Archbishop Hubert Walter in the choir above, and in this the remains will be privately deposited.



## LEGAL INTELLIGENCE.

**MEADOWS V. KENWORTHY.** — **ASHTON-UNDER-LYNE BUILDING APPEAL.**—Arguments were heard in the House of Lords on Friday afternoon in the case of T. and W. Meadows v. George H. Kenworthy, which is an appeal from an order of the Court of Appeal affirming an order of Mr. Justice Cave, made in Chambers, dismissing an appeal from an order of the Master, the Hon. Robert Butler, in the matter of an application on behalf of the appellants for the appointment of a referee or arbitrator under the 31st clause of the conditions of a contract entered into between the applicants and respondent. The appellants are builders and contractors, of Heaton Norris, near Stockport, and they entered into a contract with the respondent to erect shop and arcade premises for the respondent at Ashton-under-Lyne for the sum of £13,651. Clause 31 of the agreement provided that in case of a dispute arising an arbitrator should be appointed to settle the matter. The appellants, during the progress of the work, were paid altogether, on the architect's certificates, the sum of £11,025. This sum did not include the final certificate. After the completion of the work a question arose as to the amount still due. The appellants claimed £2,099 19s. 8d., but the architect issued a final certificate for £288 9s. The appellants on this ground claim that there is a dispute within the meaning of clause 31, and that an arbitrator should be appointed to settle the matter. The case was not concluded when their lordships adjourned.

**T. DREW-BEAR, TOLPUTT, AND BROWN V. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON.**—The hearing of this protracted case, the earlier stages of which we reported in our issues of July 17 and 24 and November 20 and 27, 1896 (pp. 98, 133, 755, and 769 last volume), and Jan. 22 and 29 last, pp. 149 and 185, was once more resumed on Monday, and has been continued from day to day this week at the Old Bankruptcy Court, Portugal-street, W.C., before Mr. Edward Ridley, Q.C., sitting as the Official Referee. It was, it will be remembered, brought by several builders' merchants, suing as trustees of creditors of William Brooks, of Folkestone, builder, against the Guardians of the Poor for St. Pancras, and their architects, Messrs. A. and C. Harston, for a balance of £24,226, or alternately £24,265, alleged to be due on a building contract for the completion of St. Pancras Workhouse. Mr. Reginald Bray and Mr. A. A. Hudson appeared for the plaintiffs; Mr. English Harrison and Mr. J. W. Moyses for the defendant guardians; Mr. A. G. McIntyre and Mr. R. W. Turner for the defendant architects. The case for the plaintiffs is that some years ago the St. Pancras Guardians resolved to reconstruct their workhouse premises in King's-road, Pancras-road, and appointed Messrs. Arthur and Christopher Harston, of Leadenhall-street, E.C., as their architects. The original contract for certain sections of the work was undertaken by Messrs. Kirk and Randall, of Woolwich. Disputes arose, and in 1892 Messrs. Kirk and Randall desired to be relieved of further duties under the contract; fresh tenders were invited for the completion of sections 1 and 2, and that of a Mr. William Brooks, of Folkestone, was accepted for £50,861. Brooks's contract was to have been completed in 15 months from May, 1892; but delays arose, and in November, 1894, the work was stopped. Messrs. Drew-Bear, Perks, and Co., 71A, Queen Victoria-street, E.C., who supplied the ironwork, Mr. Henry Tolputt, of Folkestone, who supplied the timber, and Mr. James Brown, of Cannon-street, E.C., and Baintree, who supplied some of the bricks, now sued as trustees of the creditors of William Brooks for £24,226, or alternately £24,265, balance alleged to be due to Brooks. The first claim was made up as follows: net cost of executed work £65,479 plus 10 per cent. profit £6,547, making £72,026. On this account it was agreed that £47,800 had been received on account under the architects' certificates, leaving a balance claimed by plaintiffs of £24,226. The alternative claim estimated the net cost of the work executed at £60,479, as before, but reckoned the 10 per cent. profit to be added on a basis of the contract price of £50,861, so that £5,086 (in lieu of £6,507) was claimed to be added to the net outlay, making, with £1,500 claimed for damages, the total of £72,065, and the amount claimable, after allowing for the £47,800 already received under the architects' certificates, £24,265. In addition, plaintiffs claimed 5 per cent. interest from the stoppage of the works at the end of 1894 to the date of hearing. At the resumption of this action, on Monday, Mr. Christopher Harston, F.R.I.B.A., was recalled and further examined by Mr. English Harrison. He stated that it was essential that the flooring of a workhouse should be of the very hardest and best quality, to withstand the wear and tear; it was not protected by carpets, as in a private house, and, further, the constant scrubbing was very detrimental to it. Witness, therefore, stipulated at St. Pancras that no sappy boards were to be used for the floors. For the whole job 590 squares of flooring were required, and towards this Kirk and Randall, the

previous contractors, left about 280 squares. Before entering into a contract with Brooks, witness had seen the flooring left by Kirk and Randall, but had neither passed nor rejected it. Witness knew it was sappy; hence his caution in putting provisions in the specifications and bills of quantities against using sappy boards. He had no knowledge of the condemnation by Poole, the clerk of works, during the time it was in Kirk and Randall's possession. Brooks's contract provided that he should take out any sappy boards which Kirk and Randall had laid. On June 15, 1893, he examined certain flooring on the top floor of C Block, which Poole had marked as sappy, and found that it was sappy, that it was not properly laid or cleaned off. He therefore ordered Fearon to take up some of the flooring and have it cleaned off and properly laid. Some of the flooring was relaid. The flooring was now in very fair condition, but there were still a few sappy boards in the portion laid by Kirk and Randall. He never told Fearon that he should support Poole in everything he did. As to the old cast-iron tank in K block which was taken out and replaced, witness explained that he had it examined to see if the plates were sound. He had one plate removed and tested by breaking, and came to the conclusion that the metal was fairly sound. He never heard that Poole objected to the plates or tank, and Fearon made no complaint on the subject. With regard to the plaster arches in the committee-room and the stewards' clerk's office, the only complaint was as to a defect in the plastering. Fearon admitted that it was defective, and made no complaint as to the drawing. It was so simple a matter, that Fearon ought not to have needed any assistance in setting out the arch. Witness afterwards had his attention called to the fact that brick rubbish was being used in the trenches. This he regarded as very serious, for the concrete foundation had to carry the weight of the building, and if brick rubbish were put in, the guardians would not be getting what they paid for. Witness had known such defects to be discovered years after a building had been occupied, and architects spending as much as £1,000 out of their own pockets to remedy the evil to protect their own reputation. As to the slates, it was not true that witness made objections to them; but he did complain that some of them were being damaged by careless handling. The ridge rolls, also, were very porous and bad, and some were hexagonal in section, and not rounded as specified. He objected to these rolls in the exercise of his skill and judgment as an architect. It was not true that he demanded a better class of goods than was specified. As to the tanks, they were only galvanised once, and only three out of seven were objected to on account of oxidation. In January, 1893, he went down to examine 27 sashes and frames; they were not in accordance with the specifications, but he passed them. Witness never heard of Fearon's complaints as to the delay, owing to the non-delivery of stores, until he heard them in court. He never made objections to old bricks being re-used if they were sound bricks. Witness objected to the use of some of the old bricks for internal work because they were unsound. He called one (of the samples produced) unsound and another a sound one and such as he should pass. Witness heard no complaint at the time about varying the foundation, and knew nothing of any grievance until it was mentioned in court. As to the lintels, witness said that some were fixed too high, and he told Fearon on the ground that they must be lowered at once. In such a building he never allowed lath and plaster-work—nothing but solid walls, and therefore he insisted on solid brickwork all through. Concerning the Amptill trap, witness specified a 10in. grate, and Fearon stated that he could only get an 8in. trap. Mr. Bray said he would produce the invoice, for this cost altogether about £20. The Official Referee remarked that it was a sorry dispute that might have been soon put an end to by the witness. There seemed no occasion for all the trouble and the nine months spent in getting this trap. The Witness: The trap could always have been cast. Cross-examined by Mr. Bray: Witness did not admit that he had erred in this case—if he had done so, it was not from want of experience or care. He generally got Poole's reports at the end of each week and carefully perused them, and went on the works himself about once a fortnight. Witness knew from Poole's reports that a large quantity of material was objected to. Some of the materials objected to were afterwards used; but witness had a right to allow inferior material to be used after he had expressed his objections, in the hope that next time the contractor would do better. Witness never told Poole not to make so many objections—they were, indeed, proper, so far as he could see. It was quite probable that exactly the same objections were made to the same materials in Kirk and Randall's time and in Brooks's, and very naturally so. There were a great many disputes in every job where Kirk and Randall were employed, but witness only remembered coming in contact with them on one previous occasion. In this case Kirk and Randall asked to be released

from the contract, and witness advised the guardians to do so. He did not know why they objected to go on; but he did know that at that time prices both of material and labour had gone up. The witness thought it was very unlikely that Kirk and Randall should have put forward as the reason for claiming a recession of their contract the conduct of himself and Poole. It was a common thing for contractors to complain about the conduct of the clerk of works. He nominated Poole before Kirk and Randall commenced their contract, and had no recollection that the guardians wished to advertise for some outside person. As witness was the arbitrator under the contract, the contractors were no doubt to some extent in his hands. Poole was expected to see that the builder did not use materials not up to specification, and the work would be stopped until witness had adjudicated upon it. If the contractors had required witness's attendance at any time he would have come at once. He denied Fearon's statements that on several occasions witness told him that he must obey Poole, or the work would be taken down. If there were salt in the sand, it would show itself on the brickwork as a white fur for some months; but witness could not point to any place in the building where the brickwork showed such marks, nor had he seen any. If the sand were salt, the walls would be damp in certain conditions of the weather. Nor could witness refer to any place where too fine a quality of sand was used; the fact was the fine sand was mixed with coarser stuff, and so did not do much harm. A long legal argument arose on the question, asked by Mr. Bray, whether witness knew that the guardians were to give possession of the whole of the site at once. Mr. English Harrison objected, as this was a question of the construction of the contract. Mr. Bray replied that he was dealing with the powers of the architect, and he wished to show that the contractor could not gain possession of a sufficient portion of the site. Mr. Harrison said the architect's conduct could only be impugned on an allegation of fraud. Mr. Bray: That is not alleged in this case. Mr. Harrison contended that the architect was not responsible for errors of judgment, however grievous the results might be of such mistakes. The Official Referee said doubtless the architect, as arbitrator, had to exercise his discretion to the best of his judgment. If his conduct had been such as to render it impossible for the work under the contract to be continued—and he did not say it was so in this case—it would support the plaintiff's contention that the contract had been set aside, and a readjustment must be made on a *quantum meruit*. Witness continued that he did not consider that any unnecessary delay, so far as he was concerned, took place in giving possession to the contractor. Witness urged the guardians from time to time to clear the buildings as speedily as possible, so as to allow Brooks to get on. Asked as to the ironwork, the witness said all the iron merchants, when asked to supply a girder of an exact weight according to their printed lists, replied asking for time, as they had not that particular make in stock; witness therefore specified for certain sizes and weights, "net"—that was, actual, not reputed, weights. Witness's objections to the rejected columns and B2 girders were, he maintained, reasonable. Witness was cross-examined at great length as to the ironwork, the wooden models of columns and fractured pieces of the rolled joists used being produced in court. He objected to screwing the lugs on the columns instead of them being cast in one piece, because they were not so strong, nor did they look as well. Another practical objection in a workhouse was that fleas could be harboured in the cracks where the lugs were screwed on. Passing on to the question of brickwork, he considered the bricks as a whole fair, but he could point out some bad specimens. He did not think the sample of brickwork already produced in court as up to the average; it was from the wall of the yard of H block. The stock facing brickwork was, as a whole, good, although it contained work rejected by Poole. Brickwork might, as a whole, be very good and yet contain some poor work. Witness heard what Holland and his foreman, George Smith, had said about coming from the Stepney Asylum job in 1893 to St. Pancras to see the brickwork. He should not have sent them over if the brickwork was bad, and, as a matter of fact, witness did not believe he did send them to look at the St. Pancras job. Holland failed soon afterwards, but witness could not say that Holland attributed that to witness. It was very likely that there were similar complaints about bricks, timber, flooring, &c., against Holland as here occurred with Brooks. Witness always refused to pass bricks by inspecting them in the barges, as he had often been imposed upon, the bricks under the hatchways being of a different quality to those that were visible on deck. As to the plastering, he claimed the right to have it done in the order and in the particular way witness required. Coming to the flooring, witness knew that many of the boards were sappy; but he allowed the guardians to take them over and pay for them, for they could be utilised for some other purposes. The flooring had to be stacked before being used, but



that did not prevent Brooks from bringing on to the job other boards that had been stacked elsewhere. He did not know that they were to be stacked for two years; if Poole had said so, it was not in the specification. Witness did not inform Brooks that some of these old materials were sappy; it was not his business. Brooks gave credit for about £2,500 for old bricks; but witness would not allow them to be used, except in foundations. He did allow bats to be used for certain purposes, although it was prohibited in the specifications. The nine lintels objected to were 4½ in. to 5 in. too high; they would be hidden by the lining; but when the plaster was set it would crack at that point. Witness had heard in court that two of the lintels were left at the wrong level, but he had not seen them. Witness was pressed as to his objection to the gutters, when Poole did not allow them to be used because Messrs. Macfarlane had, by mistake, made the sockets inside instead of outside. Witness was asked what difference this would make? He replied that it was not according to the drawings, and the makers admitted it was wrong. After this, he should be inclined to think that nothing did matter at all in building matters. The only difference would have been in appearance. Witness did write to the guardians that the delay in the laundry and other buildings was due to the delay of Messrs. Benham. There were many complaints—justifiable complaints—in Poole's diary as to delay by Messrs. Benham, and Fearon also complained. There was a penalty clause, but witness did not know that any penalty had been claimed. The salt-glazed bricks were generally poor, and many were too dark; the iron-work was generally bad; the timber was one of the weak points. Re-examined by Mr. English Harrison: As a result of experiment, witness knew the difficulty of getting the exact sizes and weights of rolled joints as advertised, and witness specified the actual and not the reputed weights, so as not to delay the works. So far as witness was concerned, he had nothing to do with the failure of Holland. He failed in the middle of a contract. The guardians purchased all the materials left on the site by Kirk and Randall, except some broken drain-pipes, and witness put a cautionary clause in the new contract as to the wet, sappy timber and chipped facing of bricks, to warn any future contractor, knowing as he did the condition of some of the materials. There was a good deal of very shaky timber to be seen in the roof of C Block—tie trusses, queen-posts, and common rafters, all cracked and split. Mr. Alfred Arthur Millward, called and examined by Mr. Moyses, said that he was clerk to the guardians. The witness said that he remembered Fearon calling upon him on May 31st, 1892, just as the contract was signed. He never told Fearon that he could not begin the work as nothing was ready and as nothing had been arranged as to shifting the inmates. As a matter of fact, the guardians had made arrangements for boarding out the inmates, and arrangements had also been made by which Captain Miller, the master of the workhouse, could make vacant the main block in front, or the main portion of it, within 24 hours' notice, so as to allow the builders to proceed. That was now the "B" block. Witness told Fearon to see the master of the workhouse and Messrs. Harston, who would make the necessary arrangements. He personally saw Mr. Fearon on the works, and witness was always accessible, and, until the case was launched, and during the whole of the operations, he never heard a suggestion from Brooks or Fearon that the architects or clerk of the works were acting unfairly or dishonestly. Mr. Bray said that he had never used the word "dishonestly." Mr. Moyses replied that the whole tenor of his learned friend's cross-examination of Mr. Harston was directed with a view to showing that Mr. Harston had been unfair to such an extent as to amount to dishonesty. The Official Referee: I think we had better not discuss this subject now. I say there has been no charge against Mr. Harston of dishonesty in this case from beginning to end. Mr. MacIntyre: It is made in the statement of claim. The Official Referee: If it is used there, it is certainly not used in the sense of fraud or collusion. Mr. Moyses remarked that in the statement of claim fraud was mentioned 17 times. Cross-examined: The witness said that it was not his business to interfere with the builders. Brooks was not delayed on "K" block owing to the engineer's work in the laundry—at least, the guardians were told that they were not. Capt. Thomas Miller, the master of the workhouse, examined, said that he saw Fearon on the day the contract was signed. Fearon said that he wished to commence work as soon as possible, and witness told him that he could clear the part of the building he (Fearon) wanted to go on with (the old H block) in two days. Arrangements had been made to put the inmates out to other unions. Witness did not say that nothing was ready or arranged, nor did he hear Mr. Millward say so. It was not true that Fearon was constantly asking him for possession of the old Insane Block. He did not recollect referring Fearon to the architects on any of those matters. Cross-examined, the witness said

that he had had very few conversations with Fearon; he had nothing whatever to do with the builders. Mr. Fredk. Purchase, a member of the board of guardians, and a member of the building committee, examined, said, that he never heard of any complaint at the meetings of the board or the committee on behalf of Fearon, Brooks, or the plaintiffs that Mr. Harston was acting unfairly or dishonestly. There was no suggestion, to his knowledge, that the contract was being departed from. The guardians always adhered strictly to the contract. In cross-examination, the witness said that it was the duty of the architects to watch over the interests of the ratepayers, and to see that the work was carried out according to the specification. Mr. Chas. Challen, another member of the board of guardians and of the building committee, was called, and corroborated the last witness. In cross-examination, the witness said that he had heard Fearon say that the clerk of the works was obstructing him, but he knew that it was untrue. Witness left everything to the architects. Mr. Boden, a retired builder, chairman of the building committee, gave evidence as to speaking to Fearon on several occasions. Fearon made the usual contractor's complaints as to the architects and clerk of the works. Witness's reply would be that a complaint in writing to the clerk of the board would be inquired into by the committee. He did not remember any official complaint being brought before the board. There was never any complaint which imputed unjust or dishonest dealing on the part of the architects or Poole. Cross-examined, the witness said that he knew that Poole was a difficult man to get on with. He believed that Poole thoroughly understood his business, and would take a specification and have it carried out to the letter. He might have told Fearon that Mr. Harston would have every line of the specification carried out as it ought to be. Mr. Tilley (Thos. Tilley and Sons, well engineers), who did some work at the workhouse in 1893, denied that his men interfered with or prevented Brooks's men going on with their work. Thos. Wm. Youan, foreman to Messrs. Benham, who did the engineering work to the laundry, was called, and said that he had no complaint whatever to find with Poole or Mr. Harston. Mr. Harston required the specification carried out; but if work was properly carried out there was never any trouble. Mr. Derby, clerk to Pooley and Sons, who fixed a weighing-machine at the workhouse, examined, said that it was not true that any trouble had been caused by any drawing given by his people. Mr. A. H. Woolley, secretary to Messrs. Nash and Co., brickmakers, of Slough, examined, said that a malm pavior was a hard brick. In Oct. 1892, the price of malm paviers would be 5s. dearer than picked stock facings in the field. Joseph Livock, examined, spoke as to superintending the fixing of lifts at the workhouse. Whenever his men interfered with any joinery work at the building his own carpenter made it good. Mr. Stephen Dobson, a works manager of the St. Pancras Ironwork Co., who did some iron-work at the workhouse, gave evidence as to there being no delay on their part in fitting up, nor did they interfere with any part of the work carried on by Mr. Brooks. Mr. G. R. Crickmay, an architect, of Victoria-street, Westminster, and the arbitrator to the Local Government Board, gave evidence as to accompanying Mr. Harston to the workhouse on Jan. 15 last, to examine the work done by Brooks. The witness said that the bricks supplied were generally inferior in quality, some being very much knocked about, others being sandy on the sides, and others having been badly selected. The York stone step in the entrance-hall should not have been put there. It was very laminated. The flooring boards he found to be of very inferior quality, and the sash frames were not sunk in accordance with the drawings. The joinery work had shrunk very much, which showed that the wood was unseasoned. From what he saw of the work and material, he thought that the architects had been fairly lenient with the builder. The labour on the brickwork was fairly good. Cross-examined: He considered the specification an ordinary one. He himself was very careful in drawing a specification. All brickmakers made good and bad bricks. The Official Referee interposed during Mr. Crickmay's evidence, and asked whether the case could be finished by Saturday, remarking that if it could not, it would have to stand till the month of May. Counsel stated that in all probability the case could be finished by Saturday. Mr. MacIntyre said that in certain circumstances he should have to call, on behalf of Messrs. Harston, three witnesses—viz., Mr. Curry, Mr. Davis, and Mr. McCormick. The Learned Referee said that, subject to what might be said to the contrary by Mr. Bray, he did not see how the architects could be made defendants to the action. It was arranged that the Official Referee should visit the workhouse to view the work which had been done, before the case terminated, and that he should be accompanied by two persons to be nominated by each side to point out what had been done. Mr. Crickmay, cross-examined by Mr. Hudson, said that although he could not point to

any workhouse which was better built than the St. Pancras Workhouse, he had seen buildings of a similar character which were better built. At the conclusion of the evidence called on behalf of the guardians, the Official Referee decided that the plaintiffs had made out no case against Messrs. Harston, there being no evidence that they had been guilty of fraud, dishonesty, or collusion. Judgment was accordingly entered for Messrs. Harston, but the question of costs was reserved. The case against the guardians was proceeding when we went to press.

RE FRANCIS MORTON AND CO., LIMITED.—The following resolutions were passed at the meeting of creditors held on Tuesday:—(a) That the meeting be adjourned for a fortnight, and that a committee of creditors be appointed to confer with the Receiver, with a view to the realisation of the assets to the greatest advantage for all concerned. (b) That the following form the committee:—Mr. James Dodds (Pearson and Knowles Coal and Iron Co.), Mr. Joseph G. Wright (Messrs. Isaac Jenks and Sons), Mr. William Henderson (Messrs. Henderson and Glass), Mr. W. H. Hewlett (Wigan Coal and Iron Co.), Mr. John Hall (Sheepbridge Coal and Iron Co.), and that their expenses be paid in the liquidation. The solicitor for the creditors, who had presented a petition to the Court for the winding-up of the company, agreed to have the hearing of the petition adjourned for three weeks, from the 2nd inst.

ANCIENT LIGHTS.—CHASTLEY V. ACKLAND.—With reference to the report of this case, published in our last issue, p. 329, Messrs. Templeton and Cox, the appellants' solicitors, state that the £300 damages agreed to be paid to the plaintiffs were in respect not only of obstruction of light, but also of obstruction of the access of air to their clients' house.

#### CHIPS.

Messrs. Sutton, the well-known carriers, are considerably enlarging their premises in Golden-lane, London. The drawings have been prepared by Mr. Hamilton, and the contract has been secured by Mr. B. E. Nightingale. The floors of the building are to be fireproof, on the Fawcett system, and the whole of the constructional iron and steel-work is being supplied and erected by Mark Fawcett and Co., of Westminster.

Messrs. W. and J. R. Freeman, the well-known stone and granite merchants, of 64, Millbank-street, Westminster, S.W., have opened a depot in the G.N. Railway Goods Yard, Kings Cross (entrance through "Engineers' Gate," York-road, N.), where they will keep a stock of York landings, pavings, sawn slabs, copings, sills, steps, granite blocks, spurs, bases, curbs, &c. Masons will also be there for working anything to order.

The new Municipal Buildings, Oxford, erected from Mr. H. T. Hare's designs, will be opened by the Prince of Wales, on behalf of the Queen, on May 12th.

The Bournemouth Town Council received an offer, on Wednesday, from Mr. Merton Russell Cotes, an ex-mayor, to erect an illuminated clock and drinking-fountain in the centre of the square, in commemoration of the Queen's long reign. The offer was unanimously accepted. At the same meeting, it was decided to ask Mr. Wolfe Barry, C.B., to advise and report upon the plans and scheme for the preservation of the Cliffs, and the proposed undercliff drive.

The Ecclesiastical Commissioners have decided to sell Addington Park, Croydon, the country house of the Archbishop of Canterbury. The episcopal estate attached to Addington consists of 475 acres, adjoining which is a separate property of over 700 acres, vested in the Commissioners for general Church purposes, and hitherto leased to the Archbishop of Canterbury.

Marktock Church, one of the largest and finest in Somersetshire, was seriously damaged by the gale on Wednesday. One of the pinnacles of the tower was blown down through the roof, making three large apertures, but the most serious damage is that sustained by the carved oak roof, which is of the most beautiful 15th-century workmanship.

Colonel J. Ord Hasted, R.E., attended at the council-chamber of the Driffield Urban District Council on Tuesday, and held an inquiry with respect to an application from the urban council for leave to borrow a sum not exceeding £25,000 for the purchase of the Driffield Gasworks.

An isolation hospital at Ilford is approaching completion, and will shortly be opened. The joint architects are Mr. F. W. Roper, of 9, Adam-street, Adelphi, W.C., and Mr. Horace J. Cropper, of Ilford.

Mr. David Mackenzie, Nairn, was appointed, on Tuesday, road surveyor and master of works under the Dunfermline District Committee of the Fife County Council. The salary, including travelling expenses, is £250 a year.



## Our Office Table.

THE "Jubilee banquet" of the Architectural Association will take place at the Trocadero Restaurant, on Wednesday, May 5th. It is announced in the A.A. Notes that the special committee are taking steps to secure the presence of leading public men in recognition of the fifty years' work of the Association, and already they have met with some gratifying response. It is hoped that all the past presidents will attend, as well as the presidents of the provincial architectural societies and all available members, as the price of the tickets will be the same as that of the usual annual dinner. The conference and *soirée* will probably be held on the day following the banquet.

A PROPOSAL for a further widening of Fleet-street on its southern side will shortly come before the London County Council, on the recommendation of its Improvement Committee. The City Commissioners of Sewers have written to the Council stating that they propose, with a view to continuing the widening of Fleet-street, to acquire the freeholds of the properties between Bride-lane and Salisbury-court (Nos. 82 to 97, Fleet-street, but excluding No. 89, in respect to which the Council has already agreed to contribute), and asking the Council to contribute half of the cost of the proposed improvement. The present width of the road at this point is about 45ft., and it is proposed to increase this to 60ft., the cost of so doing being estimated at £170,780. The Council has already agreed to contribute half the cost of widening Fleet-street between Ludgate-circus and Bride-lane and at No. 89. The present application is in respect of a proposed widening of the road for a length of about 216ft. The committee are strongly of opinion that to continue the widening of Fleet-street is a desirable work, and, recommend the council to accede to the request of the Commissioners and contribute £85,390, one-half the cost of the improvement.

Now that the photographic survey of Warwickshire is an acknowledged success, it has been thought by the Survey Council desirable to place the association on a more comprehensive basis. At a meeting of the council on Saturday last at The Grange, Erdington, the residence of the president (Sir J. B. Stone, M.P.), new rules and regulations, which had previously been formulated by a special sub-committee, were considered, in some respects amended, and passed unanimously. After the special business of the meeting had been transacted, the president, reviewing the past work of the survey of Warwickshire, and glancing at the possibilities of the future, gave a foreshadowing of a scheme he had thought much of for some time past, and which he had now practically matured. He trusted that, when the scheme was in working order, every photographic society in all the counties of the United Kingdom would avail themselves of the opportunities which would be afforded them to make a genuine success of a national survey of Great Britain and Ireland.

As the result of negotiations carried on last week with the authorities of the Woods and Forests by Messrs. Lloyd George, M.P., Herbert Roberts, M.P., and William Jones, M.P., the department on Saturday intimated its readiness to let on a long working lease, and on favourable terms, a large slate quarry on Crown land in Carnarvonshire. This quarry, situated at Bettws Garmon, in close proximity to Snowdon, has been disused for the past ten or twelve years. The quarry is said to contain roofing slates of an excellent quality, and a syndicate has been formed to take up the grant from the Crown, and to work the quarry forthwith. It is anticipated that within a very short time there will be several hundreds of men employed here. The quarry is let by the Crown at a rental which will ultimately merge into a fixed royalty. Had the Penrhyn quarries, which once formed a part of the Crown property in the same district, been let on the same terms it is estimated the Crown would now be receiving therefrom an annual royalty of from £15,000 to £20,000.

ON Saturday evening Professor Baldwin Brown, Edinburgh, delivered a lecture in Moffat on "Italian Painting." From the fresco painters of the 15th century the art of painting had progressed in Italy, until in the 17th century it had reached its culminating period. By that time

the secret resources of art in painting had been fully explored. Part of this work was accomplished in Italy, and part in Spain, Flanders, and Holland. The artists had mastered the human form nude and draped in all its details, learning to draw the figures in all positions with grace, dramatic power, and sympathetic style. The effects of light and shade in all their strength and beauty had also been mastered, and the knowledge gained and impressions of distance depended on certain differences of light and shade. In the matter of colour the artist had mastered the delicate interpenetration of colour which the fresco painters were unable to use in wall-painting. The latter-day painters by the use of sympathetic colours gave a play or view with a more delicate and subtle effect than a fresco, while the process was more elaborate and capable of more variety in manipulation, and all sorts of refinement could be given to the subject. This was worked to perfection by the Venetian school. Then in the 17th century the picture, formerly a wall decoration, acquired a beauty and charm of its own, became independent, and the modern picture was perfected.

### MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. "Agricultural Co-operation," by the Right Hon. Horace C. Plunkett, M.P. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Main Drainage of London." 8 p.m.

WEDNESDAY.—Sanitary Institute. "Indian Sanitation," by Baldwin Latham, M.Inst. C.E. 8 p.m.  
Society of Arts. "The Prevention of Fires due to the Leakage of Electricity," by Frederick Bathurst. 8 p.m.  
Carpenters' Hall Free Lectures. "Is a National Twentieth-Century Style of Architecture Probable?" by Prof. Banister Fletcher, F.R.I.B.A. 8 p.m.

THURSDAY.—Society of Arts. "The Prevention of Famine in India," by Sir C. A. Elliott, K.C.S.I., Secretary to the Famine Commission of 1878. 4.30 p.m.

### CHIPS.

At the junction of the Langley-road with Great Bath-road, opposite the Jesuits' College, now unoccupied, and at the entrance to Slough from London, stood, till recently, a large ornamental fountain of bronze and marble. Some thieves have succeeded in removing this from its base and carrying it off. The fountain, which was of elegant design, stood about 14ft. high, weighed several hundredweight, and was very valuable. It is supposed to have been stolen for its bronze and marble.

The new free public library for Leyton was formally opened on the 24th ult. The premises are those erected as public offices 15 years ago by the Leyton Local Board. The alterations on the ground floor provide a spacious lending library, reference library, librarian's office, and store-room. There is a new public entrance. On the first floor, the old board-room has been converted into a reading-room, with a lift connecting the lending library. The second floor, with two rooms on first floor, comprise the librarian's apartments, with bath-room, &c. The work has been done by Mr. Coxhead, of Leytonstone, from plans by Mr. Dawson, M.I.C.E., the surveyor to the urban district council.

Special services were held at Downham Market parish church on Sunday, to mark the completion of the restoration of the tower, spire, and bells. The work of retuning and rehanging the bells was entrusted to Mr. J. Gray, of Hertford. The bells, which previously were almost unringable, have now been hung on a new principle; a chiming apparatus has also been added. The work of restoring the tower and spire was carried out by Messrs. Collins and Barber, of Downham, who have repaired both spire and tower, and restored the pinnacles to their original height, thus improving the appearance of the tower. The architects were Messrs. Milne and Hall, of London.

It has been decided to restore the parish church at Fleet, near Holbeach, Lincolnshire, as a memorial of the Diamond Jubilee year. The estimated cost of the work exceeds £1,200, of which about half has been already raised.

The annual dinner of the Dublin Master Builders' Association took place on Saturday evening at Jury's Hotel. A company numbering about 90 assembled. The Right Hon. Alderman Meade, L.L.D., presided. Sir Charles Cameron proposed the toast of "The Master Builders' Association," and the president responded, as did also the hon. secretary, Mr. Good. The toast of "The Guests" was acknowledged by Mr. Drew, president of the Royal Institute of Architects of Ireland; Mr. Orpen, president of the Architectural Association; Mr. Spencer Harty, city engineer; Mr. W. A. Craig, J.P.; and Mr. Maurice Brooks.

## LATEST PRICES.

### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6 to	£6 0 0
Rolled-Steel Joists, English.....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates.....	6 15 0 "	7 10 0
Bar Iron, good Staffs.....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 10 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	7 17 6 "	8 0 0
Best Smedshill.....	10 0 0 "	10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive gauge.....	£10 15 0 to	£11 0 0
Best ditto.....	11 5 0 "	11 10 0
	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0 to	£8 10 0
Cast-Iron Stanchions.....	6 0 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0 "	5 15 0
4in. to 6in.....	5 5 0 "	5 10 0
7in. to 24in. (all sizes).....	4 15 0 "	5 0 0
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]		

Fig Iron—	Per ton.	Per ton.
Cold Blast, Lilleshall.....	105s. to 110s.	
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.	
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes.....	75p.c. Fittings 77½p.c.	
Water-Tubes.....	70 "	72½
Steam-Tubes.....	62½ "	65
Galvanised Gas-Tubes.....	60 "	62½
Galvanised Water-Tubes.....	55 "	57½
Galvanised Steam-Tubes.....	45 "	47½

Sheet Zinc, for roofing and work—	Per ton.	Per ton.
ing up.....	£22 15 0 to	£23 15 0
Sheet Lead, 3lb. per sq. ft. super.....	13 17 6 "	14 17 6
Pig Lead, in lcwt. pigs.....	13 5 0 "	14 5 0
Lead Shot, in 28lb. bags.....	16 5 0 "	17 5 0
Copper Sheets, sheathing and rods.....	63 0 0 "	65 0 0
Copper, British Cast and Ingot.....	53 0 0 "	53 10 0
Tin, Straits.....	61 2 6 "	62 5 0
Do., English Ingots.....	66 10 0 "	67 0 0
Spelter, Silesian.....	17 12 6 "	17 15 0
Cut Clasp Nails, 3in. to 6in.....	£8 15 0 "	9 15 0
Cut Floor Brads.....	8 10 0 "	9 10 0
Wire Nails (Points de Paris).....		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9		per cwt.

### TIMBER.

Teak, Burmah.....	per load £13 0 0 to	£16 0 0
" Bangkok.....	" 11 0 0 "	15 0 0
Quebec pine, pitch.....	" —	—
" Oak.....	" 2 5 0 "	4 5 0
" Birch.....	" 5 0 0 "	6 0 0
" Elm.....	" 3 15 0 "	5 10 0
" Ash.....	" 3 10 0 "	4 15 0
Dantisc and Memel Oak.....	" 2 15 0 "	3 15 0
Fir.....	" 2 15 0 "	3 15 0
Wainscot, Riga p. log.....	" 2 10 0 "	4 15 0
Lath, Dantisc, p.f.....	" 4 10 0 "	5 10 0
St. Petersburg.....	" 5 0 0 "	6 10 0
Greenheart.....	" 8 10 0 "	9 0 0
Sequoia, U.S.A., per cube foot.....	0 2 0 "	0 2 2
Mahogany, Cuba, per super foot.....		
lin. thick.....	0 0 4½ "	0 0 6
" Honduras.....	0 0 5 "	0 0 6½
" Mexican.....	0 0 4½ "	0 0 5
Cedar, Cuba.....	0 0 4½ "	0 0 5
" Honduras.....	0 0 4½ "	0 0 5
Satinwood.....	0 0 7½ "	0 1 0
Walnut, Italian.....	0 0 3½ "	0 0 7
Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in. —		

Quebec, Pine, 1st.....	£20 0 0 to	£23 0 0
" 2nd.....	14 10 0 "	16 10 0
" 3rd.....	7 0 0 "	10 10 0
Canada Spruce, 1st.....	9 10 0 "	11 0 0
" 2nd and 3rd.....	7 10 0 "	8 15 0
New Brunswick.....	7 10 0 "	8 0 0
Riga.....	7 10 0 "	8 10 0
St. Petersburg.....	9 10 0 "	13 10 0
Swedish.....	8 10 0 "	16 10 0
Finland.....	9 0 0 "	9 10 0
White Sea.....	10 10 0 "	17 0 0
Battens, all sorts.....	5 0 0 "	20 0 0
Flooring Boards, per square of lin. —		
1st prepared.....	0 9 0 "	0 16 0
2nd ditto.....	0 7 6 "	0 12 6
Other qualities.....	0 5 9 "	0 7 0
Staves, per standard M. —		
Quebec pipe.....	—	—
U.S. ditto.....	35 0 0 "	43 0 0
Memel, cr. pipe.....	230 0 0 "	240 0 0
Memel, brack.....	200 0 0 "	210 0 0

### OILS.

Linseed.....	per ton £14 15 0 to	£15 15 0
Rapeseed, English pale.....	" 25 15 0 "	26 0 0
Do., brown.....	" 20 10 0 "	26 15 0
Cottonseed ref.....	" 15 0 0 "	15 10 0
Olive, Spanish.....	" 29 0 0 "	30 0 0
Seal, pale.....	" 23 10 0 "	24 0 0
Cocoonut, Cochinchina.....	" 27 15 0 "	28 0 0
Do., Ceylon.....	" 23 10 0 "	23 12 6
Palm, Lagos.....	" 23 0 0 "	24 10 0
Oleine.....	" 19 0 0 "	20 0 0
Lubricating U.S.....	per gal. 0 6 3 "	0 7 6
Do., black.....	" 0 4 9 "	0 6 6
Tar, Stockholm.....	per barrel 1 0 0 "	1 2 6
Archangel.....	" 0 12 6 "	0 15 0
Turpentine, American.....	per ton 21 0 0 "	21 10 0



## LIST OF COMPETITIONS OPEN.

Swansea—Workhouse Additions .....	10gs. (merged in commission).....	G. B. Haynes, Clerk, 8, Fisher-street, Swansea .....	Mar. 17
Enniskillen—Town Hall (£7,500 limit) .....	£50, £20, £10 .....	Thomas Elliott, Borough Surveyor, Enniskillen .....	" 20
Christiania—Railway Terminal Station Plans .....	£555 10s., £222 4s. 6d., £111 2s. 3d., 55s 11s. .....	Railway Offices, 6, Victoria-terrace, Christiania .....	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Wash- ington Browne, A.R.S.A., Edinburgh, Assessor) .....	£100 (merged in 4 per cent.), £50, £25 .....	A. Macdonald, Town Clerk, Hillcock House, Govan .....	" 31
Sheffield—Westbar Fire & Police Station (local Architects only) .....	Four premiums of £15 .....	H. Bramley, Town Clerk, Sheffield .....	" 31
Guernsey—States Assembly Hall (£15,000 limit) .....	£100, £50 .....	N. Domaille, Supervisor of Harbour, States Offices, Guernsey .....	April 17
Long Buckley, Northants—Water Supply Scheme .....	50gs. .....	William Willoughby, jun., Clerk, Daventry .....	" 21
Halifax—Police Station and Court House (no Assessor) .....	£53, £25 .....	Keighley Walton, Town Clerk, Halifax .....	" 30
Elne, France—Water Supply Scheme (3,300 inhabitants) .....	£100, £50, £25 .....	La Marie, Elne, Pyrénées Orientales .....	July 1
Carlton, Victoria—Children's Hospital .....	£50, £20 .....	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia .....	(1896), Jan. 30
Bolton—Fire Station (£12,000 limit, local architects only) .....	30gs. .....	R. Gudgeon Hinnell, Town Clerk, Bolton .....	"
Nuneaton—Conservative Club (£3,000 limit) .....	50gs. (merged in 5 p.c.), 20gs., 10gs. .....	J. H. Bland, Solicitor, Nuneaton .....	"
Wandsworth Workhouse Infirmary—Nurses' Home .....		A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth .....	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

Gilfach Goch—Police Station .....	Glamorgan County Council .....	T. Mansel Franken, Clerk, Westgate-street, Cardiff .....	Mar. 6
Gigha, N.B.—School .....	Corporation .....	Hugh Douglas, Gigha, Argyllshire .....	" 6
Coventry—City Hospital Extension .....	Joint Hospital Board .....	G. and I. Szeane, Architects, Little Park-street, Coventry .....	" 6
Burnley—Fever Hospital, Keble Bank .....	Cricklade Rural District Council .....	W. T. Fullalove, Clerk, Town Hall, Burnley .....	" 6
Lydiard Millicent—Isolation Hospital, Parbon Stone-lane .....	Corporation .....	R. J. Bestwick, M.S.A., Fleet-street, Swindon .....	" 6
Middleton, Lancs.—Firemen's Dwellings .....	North Riding County Council .....	Wm. Welburn, Borough Surveyor, Town Hall, Middleton .....	" 6
Yarm—Police Constable's House .....	Miss A. East .....	Walker Stead, County Surveyor, Northallerton .....	" 6
Dovercourt—Three Shops and Houses .....		New Town Estate Office, Main-road, Dovercourt .....	" 6
Chelmsford—Seven Houses .....		F. Whitmore, Architect, 17, Duke-street, Chelmsford .....	" 6
New Hey—Rebuilding Baptist Sunday School .....		E. J. Clegg, 160, Huddersfield-road, New Hey, Rochdale .....	" 6
Hebden Bridge—Additions to Croft Mills .....		W. Wrigley, M.S.A., Crossley-terrace, Hebden Bridge .....	" 6
Shipley—Five Houses in Nab Wood .....		A. Brear, 66, Saltaire-road, Shipley, Leeds .....	" 6
Swadlincote—House and Shop, Alexandra-road .....		E. J. Hsley, Coppine Side, Swadlincote, Burton .....	" 6
Kinnitty—Medical Officer's House .....	Parsonstown Board of Guardians .....	Hy. Dooley, Clerk, Parsonstown .....	" 6
Manningham, Bradford—Warehouse .....	Midland Railway Co. .....	S. Jackson and Son, Architects, Tanfield Chambers, Bradford .....	" 6
Fritzenhall—Covered Footbridge .....		The Secretary, Midland Railway, Derby .....	" 6
Cadworth—House .....	South Wales Property Co. .....	H. Crawshaw, Architect, 13, Regent-street, Barnsley .....	" 6
Cardiff—41 Cottages, 14 Villas, and one Shop .....	Board of Guardians .....	Wm. Owen, Secretary, St. Mary-street, Cardiff .....	" 6
Bath—Drying Grounds, &c., at Workhouse .....	Produce Supply Association .....	J. Mannings, Clerk, 3, North Parade, Bath .....	" 6
Sunniside, Towlaw—Mission Church .....	Corporation .....	Rev. W. Loney, Stanley Vicarage, Crook, Co. Durham .....	" 8
Sleaford—Creamery .....	Durham County Council .....	John Richards, Secretary, Sleaford .....	" 8
Sheffield—Tramway Shedding at Four Depots .....	Mrs. Box .....	C. F. Wike, City Surveyor, Sheffield .....	" 8
Sedgefield—W.C. Blocks to Asylum .....		Wm. Crozier, County Surveyor, Shire Hall, Durham .....	" 8
Saltash—14 Terrace Houses .....		Mrs. Box, Beech-grove, St. Austell .....	" 8
Colchester—House .....	Gas Company .....	Wm. C. Street, Architect, 7, Victoria-street, Westminster .....	" 8
Granthorpe, Fliley—House .....	Hogg and Mitchell .....	J. B. Fraser, A.R.I.B.A., 8, Park-square, Leeds .....	" 8
Halifax—King Cross Constitutional Club Additions .....	A. Glover .....	Jackson and Fox, Architects, 22, George-street, Halifax .....	" 8
Grange-over-Sands—Cottages and Retort House .....	Corporation .....	H. Hibbert, Broughton-grove, Grange .....	" 8
Colchester—Erection of Buildings .....	Parish Council .....	W. C. Street, Architect, 7, Victoria-street, S.W. .....	" 8
Londonberry—Shirt Factory, Great James-street .....	Corporation .....	Wm. Barker, Architect, 25, Orchard-street, Londonderry .....	" 8
Mythanroyd—Eight Through Houses .....		W. Wrigley, M.S.A., Crossley-terrace, Hebden Bridge .....	" 8
Morley—Mill Premises .....		T. A. Battery, Architect, Queen-street, Morley .....	" 8
Glasgow—Extension to Purifier House, Tradeston Gasworks .....		J. D. Marwick, Town Clerk, City Chambers, Glasgow .....	" 8
Waterloo, Liverpool—Tower, Vestries, & Chapel at Christchurch .....		Austin and Paley, Architects, Lancaster .....	" 9
Shelford—Repairs to Cemetery Buildings .....		Peak and Lann, Architects, 36, High-street, Guildford .....	" 9
Longtown, Carlisle—Three Cottages .....		John Wilson, 17, Esk-street, Longtown .....	" 9
Limerick—Repairs to Town Hall .....		Wm. E. Corbett, City Surveyor, 20, Glenworth-street, Limerick .....	" 9
Kirtlebridge, N.B.—Additions to Kirtle Church .....		Hardy and Wright, Architects, 74, George-street, Edinburgh .....	" 9
Ifracombe—Rebuilding East Side of Arcade .....		Twiss and Sons, 9, High-street, Ifracombe .....	" 9
Golear—Two Houses, Swallow-lane .....		Arthur Shaw, Architect, Golear .....	" 9
Upper Auchenreath—Cattle Shed and Repairs .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Nether Auchenreath—Additions to Dwellings .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Auchenhalrig—Barn, Stable, and Sheds .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Orbliston—Offices, &c. .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Bands—Reroofing and Repairs to Offices .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Cowfords—Servants' Rooms .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Kennethmont—Rebuilding Offices .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Barnside—Cottages .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Dipple—Cottages .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Lossiemouth—Addition to Fishery House .....		Gordon-Richmond Estate Offices, Fochabers, N.B. .....	" 9
Goole—Shops, Boothferry-road .....	Webster and Bickerton .....	H. B. Thorp, Architect, Goole .....	" 10
Gosport—Alterations, Workhouse .....	Board of Guardians .....	H. A. F. Smith, Architect, High-street, Gosport .....	" 10
Gaerwen, Anglesey—Restoration of Church .....	Rector .....	P. S. Gregory, Architect, Bangor .....	" 10
Cymmer—Offices .....	Glencorwg Urban District Council .....	Cuthbertson and Powell, Clerks, 53, Water-street, Neath .....	" 11
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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### RECENT ARCHITECTURE IN LONDON.

**E**XAMPLES of good modern work by our foremost architects are often asked for. Old work is now so generally known from book illustrations, from photographic reproduction processes, and sketches, that it is almost superfluous to remind the student of its existence or locality; but it is otherwise with new buildings which have an equal claim to be studied, but are comparatively little heard of. The provincial architect and student, for instance, we know from practical experience would be glad to keep pace with important London buildings of recent erection. Through the pages of the *BUILDING NEWS* and other journals he can see the best designs and read the particulars of many of these works; but unless they are instantly recorded or tabulated for reference, the labour of research becomes too onerous. For these reasons, a great deal that is done by architects of note escapes attention. The personal inspection of buildings is of much more value than is sometimes imagined. The practitioner likes to see the actual building, the materials used, and the mode of execution, the details as carried out, or the internal decoration or fittings. An illustration, however good it may be, puts often a glamour over the work; it does not always exhibit the materials used, nor their colour, and the effect of contrast; nor does it represent the actual manner in which the building is carried out in its many details. The draughtsman, by deftly artistic touches, by shadows or exaggerated perspective, and other tricks of the pencil, may entirely misrepresent the real effect of the building as executed. By seeing the real structure, the young architect can better judge of the merits of the design as a whole, and its connection with other work.

As many architects and students are likely to visit London during the present year, either in connection with the public celebrations or during the forthcoming Building Trades Exhibition to be opened on the 20th inst., they will naturally like to see what has been done in recent times. What to see in the way of new buildings is a question we are often asked, and it is somewhat hard to answer, unless we limit it to entirely new works by foremost architects, most of which have appeared in the *BUILDING NEWS*. Any complete list of these would be impossible in the limits of one article. We propose now, in answer to requests, to give a selection from the most recent buildings by leading members of the profession. To attempt to classify these in any method would be difficult and perplexing to the visitor who wishes to know simply where the buildings are to be seen. We may, therefore, roughly divide them into Street Architecture, Domestic work, and Churches. The first naturally assumes the largest share. For the visitor's purpose, it will be best for him in planning his tours to take one or two centres from which separate routes can be made, confining his attention to a certain area, such as that covered by the London County Council jurisdiction. Therefore we propose to take Charing Cross as the main centre from which the tourist can proceed either eastwards to the City, or westwards, for in these two main directions will be found the leading examples. Churches form a separate and naturally scattered group of buildings in and around the Metropolis.

Taking as a central point Charing Cross, the visitor may find within easy distance a few

buildings of interest. Within a short radius there are Messrs. Leeming's new Admiralty Buildings in St. James's Park, the United Service Institution in Whitehall, Mr. Waterhouse's National Liberal Club-house in Whitehall-place, near the Victoria Embankment; while further south he may look at Mr. Norman Shaw's fine brick block, New Scotland Yard, facing the Embankment, to be seen at its best from Westminster Bridge, from which point the high roof and gables, and the grouping of the corner tourelles, come into agreeable play. As a work of some refinement and good detail in brick and terracotta, we may direct attention to the corner business premises Nos. 52, 53, Parliament-street, designed by Mr. H. Huntly-Gordon, F.R.I.B.A., in a freely-handled Renaissance style. The membered doorway is entirely of the latter material. Going southward and turning up Great George-street to the west, the new building of the Institution of Civil Engineers, by Mr. Chas. Barry, of stone, may be noticed, and a little further on, on the other side, a house-front in red brick may be admired for its quiet breadth of treatment and quaint, recessed windows, by Mr. Halsey Ricardo. While in this neighbourhood, a visit to the Church House, by Sir Arthur Blomfield, A.R.A., in Great Peter-street, a modern adaptation of the Perpendicular style, and the Gallery of British Art at Millbank, by Mr. Sidney R. J. Smith, F.R.I.B.A., may be made. The latter is on the eve of completion. Retracing our steps northwards to Charing Cross, the additions to the National Gallery on the north side—the National Portrait Gallery, by the late Mr. E. Christian, may be mentioned as a good example of a freely treated building, its Florentine features contrasting with the severe Classic lines of the old Gallery. Further to the west, the extensive pile of stone-fronted buildings at the corner of Pall Mall and the Haymarket, a portion of which is intended for Her Majesty's Theatre, may be noticed. It is in a florid style of Renaissance with two pavilion roofs, and is from the designs of Mr. C. J. Phipps, F.S.A. We illustrated the design in July of last year. A route from Charing Cross eastwards along the Strand brings us to one or two examples of street architecture which indicate the cosmopolitan character of this great highway of traffic. A little eastward from Charing Cross Station is the unfinished entrance to the Hotel Cecil, the largest hotel in London, by Messrs. Perry and Reed. As a sumptuous example of modern hotel building and decoration on the most lavish scale, this hotel, which extends from the Strand to the Embankment Gardens, and is principally of red brick with stone dressings, deserves attention, if not so much for its design (Renaissance) as for its appointments. A little further, on the same side, is the Savoy, another large hotel, to which Mr. T. E. Collcutt is adding in the courtyard, a loggia and reception hall. On the other side of the Strand is to be seen a recent bold attempt to employ Burmantofts faience of a warm stone colour for a front. The two-arched vestibule and recessed entrances are worth inspection. Mr. Walter Emden, L.C.C., is the architect. A little beyond Somerset House eastwards, the architect who desires to see what has been done in the use of brick and terracotta in rebuilding hotels, premises, and blocks of offices, should go through Arundel, Norfolk, and Surrey streets, which show many recent developments of brick architecture. From either of these streets he may take the Victoria Embankment route to the City. Between Waterloo and Blackfriars Bridges, the brick buildings of the London School Board; Mr. J. L. Pearson's admirable stone offices in Late Gothic, for Mr. Astor, and Sir Arthur Blomfield's Sion College, should certainly be visited. Mr. Pearson's offices

are unique and refined in detail. Late Gothic and Renaissance are the prevailing styles along the river frontage. In Fleet-street may be noted a red brick and stone tavern on the new set-back frontage.

St. Paul's Cathedral is another convenient centre. To the east, in Bishopsgate-street, is Mr. Harrison Townsend's Library and the new Bank of Scotland. A very ably-treated and refined building is the Institute of Chartered Accountants' offices off Moorgate-street, by Mr. John Belcher. The sculptured frieze and detail are well worth attention, and have been illustrated in our pages. Near by is the Ocean Accident Corporation's premises, by Mr. H. Huntly Gordon. A good example of a modern technical institute building may be seen in Mr. E. W. Mountford's recently-erected Northampton Institute, Clerkenwell, bounded on one side by St. John's Street-road. In the same locality north of St. Paul's, is a well-considered House of Retreat, in Lloyd-square, by Mr. Ernest Newton; and a visit to St. Bartholomew's Church, Smithfield, should be made to see the restorations carried out by Mr. Aston Webb. In the neighbourhood of the British Museum the Passmore Edwards Settlement Buildings, in Tavistock-place, from the designs of Messrs. Smith and Brewer, ought to be seen for the quiet breadth of treatment, and as representing an advanced school of design. We illustrated this building in July last year.

For domestic work of a superior class the visitor will find much to interest him in the western districts. It will be impossible to do more than indicate a few of the localities where the best modern work is to be seen. Many new business premises and private residences of modern architectural design may be seen in the rather select locality known as Mayfair, bounded by New Bond-street on the east, Oxford-street on the north, and Hyde Park on the west. We may mention a well-treated block of new shop premises in Duke-street, Grosvenor-square, by Mr. W. D. Caröe, M.A., of red brick. The same architect is the designer of others in this locality. In Wigmore-street, on the north side of Oxford-street, some new premises may be seen worth study; one front, by Mr. T. E. Collcutt, is entirely faced with Messrs. Doulton's terracotta, and is of a refined character, with a well-treated shop front; and at the corner of Wigmore-street and Wimpole-street a handsome block of business premises must be noted, with stone façades and tiled roofs, by Mr. Frank L. Pearson, both of which we have illustrated. In Berkeley-square, Mayfair, a house by Mr. Huntly Gordon may be noted; while the large mansion building in Park-lane, at the corner of Great Stanhope-street, for B. I. Barnato, in a florid Renaissance style, lately illustrated in our pages, by Mr. T. H. Smith, must be mentioned. Another residence in Park-lane is by Messrs. Balfour and Turner. Before quitting this locality the visitor ought to look at St. Anselm's Church and vicarage, by the same firm, in Davies-street. We illustrate the exterior this week.

By the Knightsbridge and Kensington Gore route the tourist will come to domestic work of an architectural character, especially in and around Holland Park. Mr. Halsey Ricardo has done some very pleasing work here. West of Sloane-street several red brick residences are to be seen in the neighbourhood of Cadogan-square, Hans-place, and Hans-road, designed in the Queen Anne and Georgian styles. Some houses in Hans-road, by C. F. A. Voysey, are quietly treated. A very nice conversion of an old brick house has been recently made at 163, Sloane-street by Mr. Fairfax B. Wade, in which the old stock brick walls remain with stone in the dressings and entrance, and bands of stone in the upper story. At the south end of Sloane-street, near the Sloane-square station, is the late Mr. Sedding's fine Late



Gothic church of Holy Trinity. The interior is worth inspection. Another church interior near is worth a visit for its recent re-adaptation to church ritual. We allude to St. Peter's, Eaton-square, an old Classic edifice, lately remodelled by Sir Arthur Blomfield, A.R.A. The new metal screen and pulpit and the treatment of chancel are worth notice. We lately illustrated the screen.

Messrs. George and Peto have designed a great many houses in the suburbs of London which well deserve inspection. We can only here notice some of their admirable work in Collingham-gardens. In Harrington-gardens also, a neighbourhood between the Cromwell and Fulham roads, many good examples of brick and stone, or terracotta, may be seen. Before retracing his steps eastwards, the visitor will find some recent buildings of merit at Hammersmith. The Passmore Edwards Free Library, recently erected from the designs of Mr. Maurice B. Adams, may be noted amongst others.

South of the Thames a few very good examples of public buildings in domestic work may be found. The Battersea Municipal buildings on Lavender Hill, by Mr. E. W. Mountford, in brick and stone, and of Classical design, may be mentioned, as well as some houses at Streatham in red brick by Messrs. George and Peto, also a church (St. Alban's) in which terracotta is largely employed. and Bishop of Rochester's residence, Kennington Park. Three new theatres—one at Brixton adjoining the Central Free Library, one at Denmark Hill, and a third at Lavender Hill, Battersea—have been erected. We may now mention one or two recent churches in addition to those we have named. These are situated chiefly in the suburbs, except the newly-restored church of St. Saviour's, Southwark, lately illustrated by us, and which is on the Surrey side of London Bridge. It has been so recently described that we may simply name it as worthy of a visit. One of the finest brick churches in the South of London is that of All Saints', West Dulwich, by Mr. Fellowes Prynne. The exterior has a fine apsidal end in red brick and stone, the nave end being left unfinished. But the chief features are the magnificent stone tracery screen separating the nave from the chancel and the great width of the church. St. Peter's, Hornsey, All Hallows, Gospel Oak, and St. Andrew's, Willesden, designed by Mr. Jas. Brooks, are other fine examples. Mr. A. Waterhouse, R.A., has lately erected, in Duke-street, Grosvenor-square, a red brick and terracotta building known as the Weigh House Chapel. The terracotta is manufactured at Burmantofts Works, Leeds. But it would be impossible to name all the recent churches by leading architects which have been built lately in the suburbs of the Metropolis, good examples of which are to be seen at Croydon, Streatham, and Dulwich on the south, at Hammersmith and Kensington on the west, and several in the East-end of London. In this list we have omitted all buildings that are well known and have been fully illustrated, or which our country readers already know by repute.

#### EDUCATIONAL TRAINING.

ONE crucial question has come out or been suggested by all the talk and discussion going on of late about the education of architects—namely, How far architecture is an art derived from tradition, or is founded on precedent, or on a logic of its own that is always operative? Much of the erroneous teaching on this question arises from the mistake of treating architecture as the product of one or the other of those methods; as a mere art of traditional building, an archaeological study of old buildings adapted to new wants, or otherwise as a matter of construction only, which has only to do with the relation of support to weight and other

forces; in other words, a merely mechanical problem. Each of these theses is insufficient taken by itself. Architecture must be considered to embrace both, and the educational training of the architect should mainly rest on making the student think out the second part of the problem, the constructive, before he applies the traditional method of study. The student should first be taught how to arrange his materials to the best advantage by an artistic instinct as to which is the more desirable, before he can think of mere style. The mistake of many who argue on this question is to imagine that somehow or other the art sense is to be learned from tradition—in other words, from copying old buildings—that such study is sure to lead to good architecture by the force of mere example. But this is not the way the old builders learned their incomparable methods of design. They first of all tackled the problem *ab initio*—what they wanted, and then followed the style in existence as far as they could without in one degree twisting their building to adapt itself to mere style. Support to the weights and thrusts they had to meet regulated their sense of the proportions; these were not, as some suppose, so nicely calculated that each pier could only carry just the weight and no more, but they were controlled by geometrical principles of planning. An artistic common sense was summoned to their aid, which enabled them to make each pier and buttress not merely mechanically strong enough to bear the weight or thrust, but also large enough to satisfy the eye as to apparent strength. And it is this method and no other that is still used by our foremost architects. Mr. Eidlitz, whose able work on the "Nature and Functions of Art" we have referred to more than once in the BUILDING NEWS, has earned the thanks of all real architects by placing before them the basis of their art, and his paper, read before the Institute the other day by Mr. John Slater, appears to carry out the opinions expressed in his book. For instance, he maintains that harmony of strain means that stress should be resisted by a proportionate amount of material, no more and no less. He does not mean by this that there should be no more material, say, in a pier or a buttress than is absolutely necessary to perform the amount of mechanical work; but whatever the quantity of material to be used in a given building which seems necessary to its character or dignity should be made proportionate to actual strains throughout the design. In other words, Mr. Eidlitz maintains, as others have done, that the "factor of safety," that is, the actual strain permitted in any structure, should for the same material vary in different buildings in accordance with their purpose. One factor might be used for a factory, another for a school, another for a church, and so on, until it became the key-note of the design, and its observance insured harmony. This is a logical carrying out of the principle of statical design. By this principle, structures of rolled iron and steel would possess the most elegant structural form, those of stone a more massive form, and in fact, the keynote of proportion would, in fact, differ as the ultimate resistance of the material varied. Really this principle holds in all our buildings; Durham or Westminster Abbey is more massive than iron structures like the Crystal Palace or the St. Pancras Railway Station for the same reason, and they all maintain, or ought to preserve, the keynote, or architectural scale, of proportions, though widely different in relation of the points of support to the area covered. The author mentions a case of discord where granite columns of the same apparent size in a building carries in one part a portico, in another part a wall 300ft. high. The example is probably one of the tall office buildings in New York. It would be easy, of course, to extend

examples of the truth of the proposition laid down. Many will occur to the reader. No new style, as Mr. Eidlitz says, will ever be introduced, when a material like steel is referred to the Greek portico, instead of to the law of statics. And yet the architectural student is instructed to take his proportions from the former, rather than derive them from the latter; and this must be the result of studying handbooks of architectural style or the drawing and measuring of old buildings. In our English courses of architectural study, we adopt practically the system of the Ecole des Beaux-Arts, which both Mr. Eidlitz and the late Viollet le Duc have protested against years ago for its mere academicism. The same theory of design was broached in this journal. Now a few leading men begin to acknowledge the principle. Yet, in spite of all these attempts, the architects and teachers of the day go on telling students to pursue the old methods of teaching styles and orders. No doubt it is a good thing for a young student to "cut his teeth" on Greek and Gothic, to study and sketch old buildings; but the practice of teaching design must be based on the inductive method of inquiry. We do not necessarily follow Mr. Eidlitz in his rules for the design of mouldings and carved ornament, which, if carried out, would, we fear, destroy any artistic spirit or feeling that the architect might possess. The danger of all systems founded on logic is to obscure the innate sense of beauty in form and colour, and to conform everything to mechanical rule; but still we maintain that to teach architectural design is a process based on rational and logical principles up to a certain point, to be determined only by the faculty of the learner himself, and that to set him to copy and reproduce what has been done ages ago is to call into play faculties which are, if anything, contrary and hostile to those which the inventive artist needs to cultivate. Let architectural precedents by all means be studied; disciplinary work is always valuable, as it teaches us not to over-estimate ourselves, and so there can be no objection to pursue the course of study of the French Académie, so long as these studies are not put forward as the mode of teaching architectural design, but simply as history is taught the student, to give him a wide and exact knowledge of what has been done in the world during the past as a collateral branch of a liberal education.

#### THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held at 9, Conduit-street, W., on Friday evening last, Mr. W. HOWARD SETH-SMITH, vice-president, in the chair. Messrs. H. W. Currey, S. Holderness, and A. Williamson were elected as members.

#### GREEK SCULPTURE AND GREEK LEGENDS.

A lecture on this subject, illustrated by numerous lantern views, was read by Mr. F. S. GRANGER, D.Litt., London. The author explained at the outset that the sculpture he proposed to describe was that of the Acropolis of Athens. The legend was that of Athena, the divine protector of the Athenians; both legend and sculpture being intimately connected with the architecture of the Acropolis. The lecturer proceeded:—The Greek temple as a whole—taking the building along with its ornaments—has never been surpassed for excellence of design, perhaps has never been equalled. This does not prevent us from agreeing that, as architecture only—building apart from sculpture—some of the cathedrals and abbeys of the 13th century are nobler works than even the Parthenon. But if you take the two together—architecture and sculpture—you must assign the palm to Greece. Interesting and beautiful as Mediæval sculpture often is, it falls short of the knowledge and technical skill of Greek sculpture. No one can seriously maintain that Mediæval sculpture, at any rate on this side of the Alps, is comparable to Greek work of the first or even of the second order. And this consideration will affect our



estimate of Greek art as a whole. The excellence of the Parthenon, for instance, rests upon a certain balance of subordinate excellences. It is a perfection depending upon harmony. I shall try to show how various the elements were that entered into this harmony; how architecture, sculpture, both applied to a building and standing free, and colour decoration, united together to express certain religious beliefs, and to answer certain religious ends. We need not be surprised, therefore, that the work of Stuart and Revett should have led, at the end of last century, to a revival of Greek architecture, and that Vitruvius and Palladio had to yield to the architects of the temples upon the Acropolis. This revival, however, suffered from the defects of most revivals. The architecture of Greek temples was applied to purposes for which it was unfitted. Moreover, the spirit of the style was misunderstood in a most important particular. Colour decoration was left almost out of account. Greek buildings, on the other hand, showed a brilliant scheme of colour in which the white marble surfaces contrasted with the gold, and blue, and vermillion of the sculpture and the mouldings. Hanover Chapel, therefore, was not a building in a truly Greek style. Architects have tried to convince themselves that certain rules of proportion are enough to insure impressiveness of design. But the public takes little interest in the geometrical recipes of which we have heard so much, and here for once the public instinct is correct. Greek architecture in England has suffered still more seriously from being used without the sculpture for which the pediments and friezes offer the frame. Greek architecture stands, then, in the most intimate relation with the allied arts, and some of its apparent defects arise from the necessities imposed upon it by this relation. A building in the Greek manner, without plastic ornament and without colour, falls far short of the true spirit of the style. The very fitness of Greek architecture, therefore, for its special purposes, led to its being found unsuitable, under the changed conditions of English life. It furnished very obvious handles for attack to those who admired the Mediæval styles, and much was said about its imperfections. After these two stages, first of indiscriminate imitation, and then of equally indiscriminate rejection, there has come the third stage, that of the temper that judges, the critical stage. We are ceasing now to take sides, and are trying to understand. There is a large public which is interested in the development of ancient Greek art, and the studies of several generations of archaeologists are converging upon fairly certain results. We owe to Mr. Penrose a more correct idea of the exact structure of the Parthenon. It has sometimes seemed to me that when we go back to antiquity, whether of the Greek world or of the Middle Ages, we ought also to carry with us the method and temper of the ancient critics. Matthew Arnold, in his essay upon the "Study of Poetry," has formulated a method which is strikingly in accordance with their precepts. He suggests that the student of poetry should carry in his memory a few fine lines of poetry and apply them as touchstones; not, indeed, because all fine poetry is alike, but because our judgment becomes more acute when it has before it the materials for a comparison. Let us apply this to the criticism of architecture. If we become thoroughly familiar with the design and detail of one or two fine examples in each kind we shall have with us a standard by which we can measure the quality of any work that may be set before us. We shall not, indeed, ask that the details of the building that we are judging shall be like those of the test example. We shall find, however, that the faults of a building of second or third-rate design will be more apparent in the presence of really good work. Such a method, it seems to me, is also the right one for those who are themselves engaged upon design. If the mind is continually refreshed by the study of fine examples, it will become better able to criticise its own work. This is the ancient method of imitation as opposed to the modern. Let us turn back for a moment to Hanover Chapel. We are referred to the temple of Athena at Priene for the details of the external order, and to the Erechtheum for the general proportions of the front. St. Pancras Church goes much further even than this. The building is like a composite photograph in which half the buildings of Athens are struggling for the first place. "It is a poor temper," says an ancient critic, "that is content to follow closely that which is being

imitated." Hence it may be said of most of the buildings of our Greek revival that they are not in the Greek manner. The distinguishing feature of Greek art is a disinterested love of beauty. In contrast with our modern effort to be striking, or to be edifying, the Greek was content to be confined within the limits of his own art and to seek the beautiful. The pursuit of truth for its own sake, and apart from technical purposes, finds little encouragement in the present; the pursuit of the beautiful finds even less. It is the imperishable glory of the Greek mind that it devoted itself with an enthusiasm that has never been surpassed to these two great ends. Let us now see how the Greek love of the beautiful found expression in the works of art upon the Athenian Acropolis. This oblong eminence was the centre from which the city spread, and contained the sites of the greatest sanctity. It was the Mount Zion of Attica. Long before the Persian invasions, long before the building of the Parthenon and the Erechtheum in the shapes in which we know them, Athena was worshipped upon the sacred spot to the north of the Parthenon. Several legends grew up round the place. According to the belief of the Athenians, Athena had originally to contend with Poseidon, the god of the sea, for the worship of the Athenian state, and the visitors to the Acropolis could see the olive tree which Athena made to spring up as a proof of her power. Her rival Poseidon, to show his power, cleft the rock with his trident, and a spring of salt water gushed forth from the place. The King of Athens, who acted as arbitrator, awarded the palm to Athena. The contest was represented in the sculptures of the western pediment of the Parthenon. The eastern pediment of the same building portrayed the birth of the goddess. According to a quaint old legend, she was born from the head of Zeus. A black figured vase shows us how the event was imagined by the Athenians of the 6th century. Zeus is sitting upon a throne with a lion's head at the back, and a winged sphinx underneath as a support. He is robed in a tight-fitting tunic, and a mantle is thrown round his shoulders. He holds the lightning in his right hand, and gesticulates with the left, while from his head Athena springs up equipped with shield and spear. Ilithyia, the goddess of childbirth, stands before Zeus, and moves her hand in a characteristic manner. Still further to the right is Ares, the war-god, armed with lance and helmet and with the Medusa shield. Behind the throne Apollo celebrates the joyful event by music on his lyre, and Hermes, the messenger of heaven, with his winged shoes, traveller's cloak, and broad-brimmed hat, is ready to carry the news to Athens. There is no reason to doubt that the ordinary Athenian believed sincerely in these legends. So strong was their belief that the tyrant Pisistratus took advantage of it, and by a curious device secured his return from exile. He dressed up a tall woman in the attire so familiar to the city, and the people seem to have been deceived into thinking that their divine patroness was recommending them to receive back Pisistratus when he rode to Athens with the pretended Athena by his side. In the height of the glory of the city the same sincere simplicity of belief was still shown. During the building of the Parthenon a wonderful piece of fortune befell, which, says Plutarch, showed that Athena did not hold aloof, but was helping to accomplish the work. A very active and zealous workman slipped and fell from the scaffolding, and was in a condition so dangerous that he was despaired of by the physicians. Pericles was affected painfully by the accident, but was visited by Athena in a dream, and was informed of the remedy. Of this he made use, and the man was healed. In order to record the event, the great statesman erected a statue to the goddess as the giver of health, Athena Hygieia, and the pedestal of this statue, with the inscription, is still to be seen at the entrance to the Acropolis. It was first and foremost through the religious emotion that the masterpieces of Phidias and his contemporaries affected the average Athenian. Only in the second place was note taken of their perfect workmanship. The rude wooden image in the Erechtheum that fell from heaven, before which the famous lamp of Callimachus for ever burned, was doubtless more revered than the great statue of the neighbouring Parthenon. As the character of the Athenian State changed, so also did the character of their goddess. When the Athenians were a people of farmers, she was thought to give rains and abundant crops. Hence,

in the eastern pediment of the Parthenon she is accompanied by the Hours who bring the harvest season, and by the Sisters of the Dew. As the goddess of the sailor, she contrived the magical vessel in which the Argonauts sailed to find the golden fleece, and her temple on the promontory of Sunium brought comfort to the ships that beat round that dangerous coast. As the patroness of victory she was called Athena Niké, and in order that she might never desert her people she was represented without wings. But the goddess was more than the patroness of the farmer, the merchant, and the soldier; she was the embodiment of wisdom. It was her inspiration that guided Odysseus in his wanderings, and Heracles throughout his labours. There is a beautiful little relief in the Acropolis Museum; it represents the goddess leaning pensively upon her spear, her eyes fixed upon the memorial stele before her, which may be supposed to contain the names of deceased warriors. This charming design shows that she could sympathise as well as inspire. We may enter now, perhaps, into the spirit with which the Athenians celebrated every year the birthday of the goddess at the great festival of the Panathenæa, July 28. This began in the early morning with a procession to the Acropolis, in order to offer a new robe, or *peplos*, to the goddess—a piece of saffron cloth embroidered elaborately with the conflict between the gods and the giants. This robe was conveyed in state along the streets to the Acropolis, and there was hung round the great statue, or perhaps before it, as a curtain. Let us take the ideal figure of Athena as a clue, and let us join, so to speak, in the procession of the citizens of Athens. We shall find that the great masterpieces of plastic art are all, as it were, set to the key of this religious ceremony; the main idea of it—the birth, the power, and the honour of Athena—being like a pervading diaphanous. The sculptures of the Parthenon are not exercises in which merely the skill of the artist is displayed: they are the vehicles of living religious ideas. As we approach the Acropolis, let us suppose that the magic of fancy has restored to their former splendour the ruins of the entrance and of the temples which lie beyond. By the careful comparison of the actual remains and of the literary evidence, the archaeologists of this century have gradually restored the arrangement of the works of art upon the Acropolis, and we are enabled by their aid to substitute for the existing ruins a picture in which the buildings and the sculpture are united into an harmonious whole, as in the restoration suggested by Thiersch. One of the most prominent objects was the colossal bronze statue of Athena the Defender, which rose to a height of 25ft. This work has perished, without leaving any visible trace, except a rough representation upon certain coins. As you pass between the columns of the Propylæa on to the rocky plateau, the eye is caught by the rich colour of the crystalline limestone rock. It is of a heavy red or maroon, passing into dark purple or indigo. But in some lights the effect is changed. The lecturer's first view was gained one evening as the sun was nearing the horizon, and the rays of light, which were almost level, so struck the surface of the limestone that it seemed of a light rose-colour. Against this the white columns of the Parthenon stood out with great streaks of dull gold where they were stained by the weather, while behind the rock and the white marble and the weather stains the clear evening sky formed a background. In a well-known passage of the "Seven Lamps," Mr. Ruskin compares to their disadvantage the Greek temples with the coloured architecture of Venice. But nothing can be more wonderful than the strange flickering of the white marble columns as they seem to flame out against the blue. Over this brilliant foundation, coloured ornament was applied, like a delicate embroidery, to the chief architectural features. As you pace the summit of the Acropolis, you can see many a marble moulding still carrying the traces of this. Colour was applied to sculpture by the Greeks not less systematically than to their buildings. It is curious that the notion of coloured statuary should be so repugnant to the prevailing taste, and yet there is scarcely a museum of classical antiquities in which traces of colour are not to be found. I do not mean to assert that modern Greek buildings and sculpture cannot be of the first order without the use of colour; but they are parodies rather than imitations, if we view them with respect to their originals. We have no less an authority than



that of Praxiteles, the sculptor of the Hermes of Olympia, for saying that sculpture is benefited by the application of colour. The recent discovery of the beautiful sarcophagi at Sidon, with their beautiful colouring, has furnished us with a standard by which we may appreciate other works of art that have been less fortunate. I am supposing that we have now passed by the great bronze statue of Athena, and that we have the Erechtheum on our left. While the modern architect is struck by the irregular disposition of the building, and the refined delicacy of its detail, the Athenian would think of the venerable image of the goddess, of her sacred olive tree, and of the salt-water spring of the sea god. The beautiful figures of the southern porch have also a sacred office; they are really representative of the young girls who carried certain sacred baskets in the triumphal procession. Does it not seem as if they, too, were about to fall in with the company, as they stand there with one foot moving forward? If the maidens of the Erechtheum seem to be moving towards us, the figures on the frieze of the Parthenon are keeping pace with us. For between the columns of the Parthenon we catch continually fresh glimpses of a band of sculpture, the marble counterpart of the procession of the Athenian people for ever travelling towards the eastern door. The example shown is taken from the western frieze, and represents some of the Athenian cavalry. It is specially interesting for the beauty of one of the heads. But we must not stray very far into the bypaths that open on either side; the procession is still moving on towards the eastern entrance. In the centre of the eastern frieze the chief person in the Athenian hierarchy, the Archon Basileus, receives from a boy the new robe that has just been brought for the divine guardian of the city. When the spectator reached the eastern end of the temple he found overhanging him the great cavernous pediment in which the more than life-size sculpture stood out from the background with almost oppressive reality. Surely there, on the annual festival, as the horizontal rays lit up the sculpture in the early morning, it would seem as if the mysterious birth of Athena were happening. The crude realism of the vase painting which we studied a short time since could not satisfy the great artists who worked upon the Parthenon. Fortunately there is a relief, now in Madrid, which enables us to imagine with some likelihood what the central portion of the group must have been. We may suppose the sculptor to have dwelt rather upon the mystical significance of the old legend; the coming forth of a spirit of wisdom from the mind of the supreme god, wisdom strong in the possession of spear and helmet and buckler—with the spirit of victory reaching forth the olive crown in the sure confidence that it would be earned. It would be difficult to exaggerate the influence which this vivid presentation of their patroness exercised upon the Athenian mind. When Constantine in his new capital dedicated his great church to the Holy Wisdom—*Sancta Sophia*—the dedication was in striking harmony with the ideal embodied in Athena. If the influence of the goddess floated down from the Acropolis upon the city below, it found its concentrated expression in the great statue of Phidias. Of the statue itself, every trace has perished, and we must seek a substitute in the copies that have survived the wreck of the Classical civilisation. Of these, the most useful is the little statuette found near the *Varvakeion Gymnasium* in Athens, and named from the place of its discovery. "The statue," says Pausanias, who saw it in the second century of the Christian era, "is made of ivory and gold. In the middle of the helmet is a sphinx, and on either side there are griffins. The goddess stands erect, clad in a robe which reaches to her feet. On her breast is the head of Medusa wrought in ivory. With one hand she supports a victory of about four cubits in height, and in the other she holds a spear. A shield is placed against her feet, and near the spear is a dragon. On the pedestal the birth of Pandora is represented." The little statuette is concordant enough with the description of Pausanias to make us think it to be a fairly accurate representation of the general composition of Phidias' great work. There are still remaining traces of colour—of red and blue upon the sphinx, and of red upon the aegis. But the statuette falls far short of the style of the original. Let us correct it by reference to a head found near the Acropolis. It is supposed to be copied

from the work of Phidias. The eyes have been represented by a bony material inserted in the sockets, and the hollows of the pupils were once filled in with some gem or enamel. The hair was gilt, and the head was covered with a helmet. I know scarcely any other object which enables the modern better to realise the vivid effect of Greek sculpture—its power "to bring the living features out of marble," a power so poetically figured in the legend of Pygmalion. With these introductions, let us enter the presence of the great statue as Fergusson has restored it. The details of the restoration are more or less open to question, and although his drawing fails to do justice to our conception of the goddess, it may serve to concentrate the ideas with which we have been occupied. Let us sum up our conclusions. We began by observing that the architectural surroundings of Greek sculpture were rendered much more vivid by the help of colour than modern architecture designed in Greek styles would lead us to expect. We noticed, further, that the use of colour in sculpture must have produced an effect somewhat unfamiliar to our modern taste. These two considerations warned us against supposing that we have really fathomed all the meaning of Greek art. We noticed, also, that the real source of the artistic unity of the works of art upon the Acropolis was to be found in certain beliefs of a religious character—beliefs which offer some striking points of resemblance to the Mediæval beliefs which in their turn found a similar expression in sculpture. Let us contrast these conditions with the conditions of the present. There now in England is no general and vivid imagination of sacred personages and events to which the artist can appeal, or to which he can minister. Secondly and lastly, by foregoing the use of colour, the architect and the sculptor resign the most powerful charm at their disposal. I will ask you to think of the drab stonework, and the dull sculpture of the British Museum façade, and when you have done so, to agree with me that Greek architecture and Greek sculpture have never been really revived in England.

Professor ERNEST GARDNER, of University College, Gower-street, proposed a vote of thanks to Dr. Granger, remarking that the application of colour to sculpture and architecture was a matter of extreme interest to all present. He agreed with every word the lecturer had said on this point, and would emphasise still further his views as to the keen love of colour displayed by the ancient Greeks in their monuments and buildings. Of course, the real difficulty was that our climatic conditions were entirely different from those of Greece. Indeed, he ventured to think that if such a Parthenon were erected in London as Ictinus built in Athens it would not look as well in ten years as that edifice did after twice as many centuries. One strong inducement to use colour on buildings in Greece was the intense glare of the sunlight, which rendered it impossible to look at an edifice constructed of the white marble, so largely used, unless the details were picked out with colour. In the last period of Greek art this colour was applied with great moderation, and was never employed over large surfaces, and the tones chosen were primaries. The same decorative treatment was adopted in sculpture, and could also be seen in the wonderful sarcophagi from Sidon, now in the Museum at Constantinople, to which Dr. Granger had referred. We had a prejudice against tinted sculpture; but anyone who had seen the effect of colour, as applied to these Sidonian carvings, would have his objections removed. In reply to the chairman, Professor Gardner said in some modern work in Athens half-tints were used; but the effect was very unsatisfactory, and there was a manifest want of simplicity.

Mr. GRAY SKIPWORTH observed that, granting that more colour might be used in English architecture, what modifications could be used? The only available materials to withstand the gloom, smoke, and dirt of our large cities were polished granite and the finer qualities of glazed bricks and tiles. The Englishman, like the German, was very deficient in a sense of colour; but there was no more difficult problem than how to introduce colour into the exterior of our buildings in such a climate as London or Sheffield.

Mr. G. H. FELLOWES PRYNNE, in seconding the vote of thanks, said that what struck one in looking at Greek sculpture and architecture was the deep religious feeling thrown into the work. If our work was to be raised in character, architect and craftsman must be more in touch with

each other, and must both be actuated by a higher motive than mere *£ s. d.* The question of the application of colour had been ably treated by Dr. Granger and Professor Gardner; but the practical difficulty was where the treatment should stop. In London, not only was the climate unfavourable, but the materials were very different from those of Greece—most of our glazed brickwork was most unsatisfactory. All architects longed for more colour, and would be thankful for any suggestions tending to show how it could be applied in a satisfactory way.

Mr. B. FLIGHT FLETCHER, hon. secretary, supported the vote of thanks to the lecturer, who had, he said, indicated in a very few words the principles which governed the ancient Greeks in their treatment of the finest monuments. Dr. Granger had indeed struck out the right lines of architectural criticism in examining the reasons which prompted the production of these great works, while his conclusions must appeal to all who studied the motives which underlay Greek art. He believed it was most desirable for the architectural student to thoroughly study some one building, and, if possible, to measure it up, rather than seek to obtain a smattering of many styles. The study of ancient architecture was worse than useless unless principles were considered rather than mere forms. As to colour in architecture, he did not think they would see good colour in this country, and he did not see the necessity for it in this climate. Our stones were coarser, and no one had yet introduced a material that would withstand the London atmosphere. It should be remembered that the Greek temple was at once the church, museum, picture-gallery, and free library all combined in a single building. He feared Mr. Fellowes Prynne's expectations of the benefits to architecture that would accrue were our workmen to possess a deeper religious feeling for the work were over-rated, for the Parthenon was built by the labour of slaves, who probably did not take much interest in the edifice they were rearing.

The CHAIRMAN, in putting the vote of thanks, remarked that it would be a mistake, he was convinced, to attempt to reproduce Greek schemes of colour or of architecture, for the sun, which gave all the play of reflected colour and light and shade, was absent. The only commonsense plan, therefore, was to adopt the conditions which environed us, to develop our indigenous styles, and to trust to form rather than to colour. Inigo Jones failed to realise this, and his work was to a certain extent a failure; but Wren grasped it, and, with a true Gothic feeling in work which bore a Classic dress, produced effects entirely suited to our climate. Our work should be dominated by variety rather than unity, and characteristic examples of what should be the treatment fitted for our requirements were to be seen in such works as New Scotland Yard, the Victoria Courts at Birmingham, and Sheffield Town Hall.

The vote of thanks having been accorded by acclamation, Dr. GRANGER replied. He said it was now eleven years since he worked in the rank and file of the Association, and he feared he had seemed to speak from the standpoint of the superior person, but he could assure the members he had not intended to do so. He did not now feel trammelled by practical considerations, and therefore could indulge in a plea for more colour in our London architecture.

## STABLE CONSTRUCTION AND SANITATION.—VI.\*

### TEMPERATURE AND HUMIDITY.

IN connection with the adequate ventilation of stables, it is necessary to bear in mind that, as far as practicable, a fairly warm and equable temperature should be maintained within the building. Horses can only be brought to the highest physical condition in a warm and comparatively dry atmosphere. In the case of valuable animals, such as racehorses, &c., where it is essential to exercise the utmost care in every detail, it is desirable to arrange means for controlling the temperature and humidity of the internal air. During the summer time, the temperature should not exceed 70° Fahr., whilst in winter it should not be allowed to fall below 45° or 50° Fahr. The most comfortable average temperature for stables may be taken at from 55° to 60° Fahr. This degree of heat should not, however, be attained by restricting the fresh-air



supply to the building, and so allowing the temperature within to be raised by retaining the warm vitiated air exhaled from the horses' lungs, together with the heat given off from the bodies of the animals.

The fact that horses thrive better in a warm rather than in a cold stable, and also that a smooth, glossy coat is more easily attained by the same means is well known to grooms. The stable-man will, therefore, frequently close all the inlet and outlet ventilators so as to produce a feeling of warmth, perfectly oblivious of the greater evils which are produced by the animals being compelled to breathe impure air again and again until it becomes completely laden with unwholesome organic matters.

Where considered necessary (as is sometimes the case in racing establishments, &c.), any artificial warming of the stables should be effected by means of stoves or heating apparatus specially designed for the purpose. In many instances they may be conveniently warmed by the provision of a series of hot-water coils connected with a boiler heated by the harness-room grate or stove. For an extensive range of buildings it would be necessary to arrange a separate heating-chamber and boiler for this purpose. Fig. 39 shows a typical arrangement of boiler and hot-water pipes for heating the coils. The flow and return pipes should preferably be carried under the floor, so as to be out of the way of the horses. They must be covered with some good non-conducting

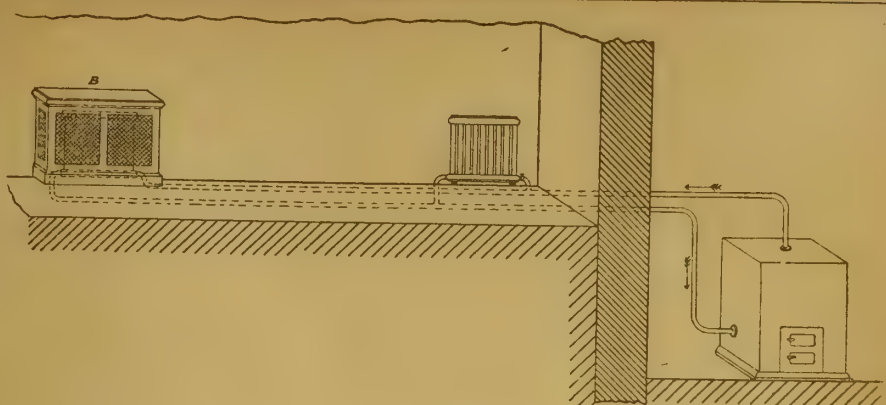


FIG. 39.

air is usually ascertained from the difference of the readings of a wet and dry bulb thermometer. This form of hygrometer consists of two delicate thermometers placed side by side. One of the bulbs is covered with muslin and kept constantly moist by being connected with a few cotton threads to a small vessel of water. The water then rises from the vessel by capillary attraction, and the moisture is evaporated from the surface

air is expressed as a percentage of the amount of vapour required to cause saturation. Perfectly dry air is represented as zero, or 0, and complete saturation as 100. To ascertain the relative humidity by means of the wet-bulb hygrometer it is necessary to first determine what is known as the "dew-point." The dew-point is found by calculating the temperature at which the amount of vapour actually present in the air would

FIG. 41.

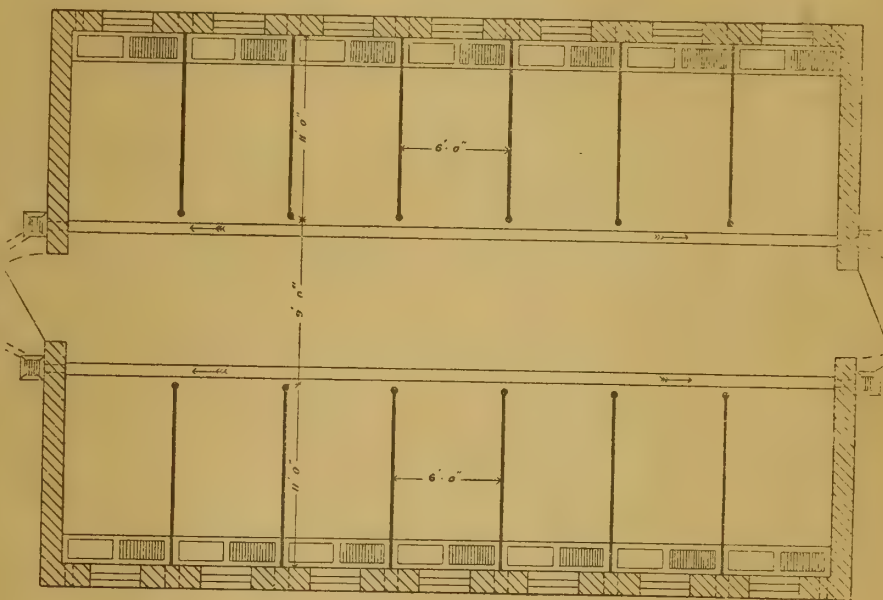


FIG. 42.

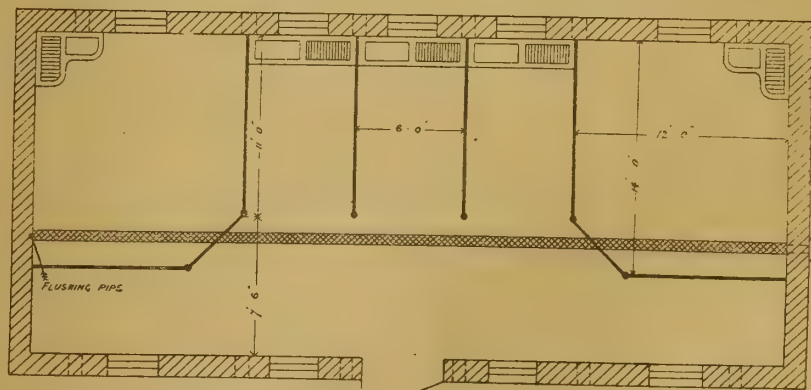
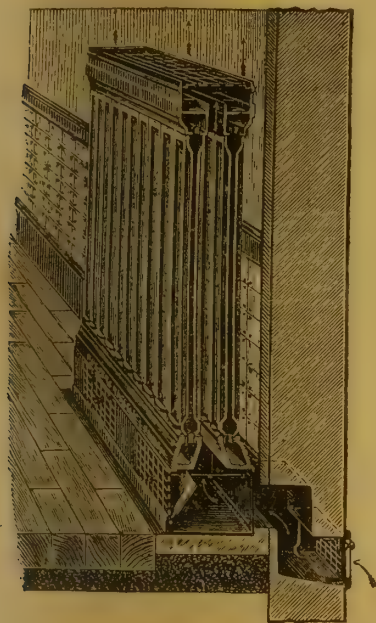


FIG. 40.



material, such as hair-felt or slag wool. The hot-water coils should be placed in convenient positions and protected from injury by inclosing them with ornamental gratings or coil-cases, as shown at B (Fig. 39).

Fig. 40 is an illustration of a ventilating coil so designed and arranged that the incoming cold fresh air is well warmed before being distributed through the interior of the building.

Stables may also be warmed by means of one or more slow-combustion ventilating stoves placed in suitable situations, so that the cold fresh air, before being delivered into the building, is first warmed by passing through the warm air-chamber of the stoves. A water-pan having a constant supply of water should be fixed near each stove in order to maintain the air at a proper standard of humidity, otherwise the air is liable to become too dry.

Although the air of stables must be comparatively warm and dry, yet a certain amount of humidity in the atmosphere is a necessity, for a perfectly dry air is totally unsuited for supporting life. Large quantities of watery vapour are given off during the process of respiration, so that if the ventilation is defective, the air within the building becomes both warm and damp. Air saturated with watery vapour is lighter than dry air at the same temperature, and for this reason the moist warm air respired from the lungs ascends more easily, so that proper ventilation assists in removing the excess of moisture thus given off. The amount of moisture present in

of the wet bulb with more or less rapidity, according to the dryness or dampness of the surrounding atmosphere. Heat is absorbed during the process of evaporation, and the wet bulb consequently reads lower than the dry. The greater the dryness of the air, the greater is the difference between the readings of the two thermometers. When they both record the same temperature, the air is saturated with moisture. For purposes of comparison the humidity of the

cause saturation—that is to say, the point at which the saturated air would commence to deposit dew. The "dew-point" may be ascertained by the following formula—viz.:

$$\text{Dew-point} = T_d - F(T_d - T_w),$$

where  $T_d$  = Dry-bulb temperature.

$T_w$  = Wet-bulb temperature.

$F$  = Factor for dry-bulb temperature as found in Glaisher's tables.



The following list of Glaisher's factors will prove sufficient for ordinary purposes—viz. :

TABLE A (GLAISHER'S FACTORS).  
TABLE OF FACTORS FOR COMPUTING THE TEMPERATURE OF THE DEW-POINT BY MEANS OF A WET-BULB HYGROMETER.

Dry bulb temperature.	Factor.	Dry bulb temperature.	Factor.	Dry bulb temperature.	Factor.
Degrees Fahr.		Degrees Fahr.		Degrees Fahr.	
20	8.14	41	2.18	68	1.79
21	7.88	45	2.16	69	1.78
22	7.60	46	2.14	70	1.77
23	7.28	47	2.12	71	1.76
24	6.92	48	2.10	72	1.75
25	6.53	49	2.08	73	1.74
26	6.08	50	2.06	74	1.73
27	5.61	51	2.04	75	1.72
28	5.12	52	2.02	76	1.71
29	4.63	53	2.00	77	1.70
30	4.15	54	1.98	78	1.69
31	3.70	55	1.96	79	1.69
32	3.32	56	1.94	80	1.68
33	3.01	57	1.92	81	1.68
34	2.77	58	1.90	82	1.67
35	2.60	59	1.89	83	1.67
36	2.50	60	1.88	84	1.66
37	2.42	61	1.87	85	1.65
38	2.36	62	1.86	86	1.65
39	2.32	63	1.85	87	1.64
40	2.29	64	1.83	88	1.64
41	2.26	65	1.82	89	1.63
42	2.23	66	1.81	90	1.63
43	2.20	67	1.80		

Having thus found the temperature of the dew-point, the relative humidity of the air may be ascertained as follows—viz. :

Humidity =  $\frac{W}{W_1} \times 100$ ,  
where W = Weight of vapour at dew-point per cubic foot of air.  
W<sub>1</sub> = Weight of vapour per cubic foot of air necessary to cause saturation at actual temperature of the air.

The subjoined table shows the weight of vapour contained in a cubic foot of air at the temperature of dew-point—i.e., the weight of vapour necessary to cause saturation :—

TABLE B.  
TABLE SHOWING WEIGHT OF VAPOUR CONTAINED IN A CUBIC FOOT OF AIR AT THE TEMPERATURE OF DEW-POINT, THE BAROMETRIC PRESSURE BEING 30IN.

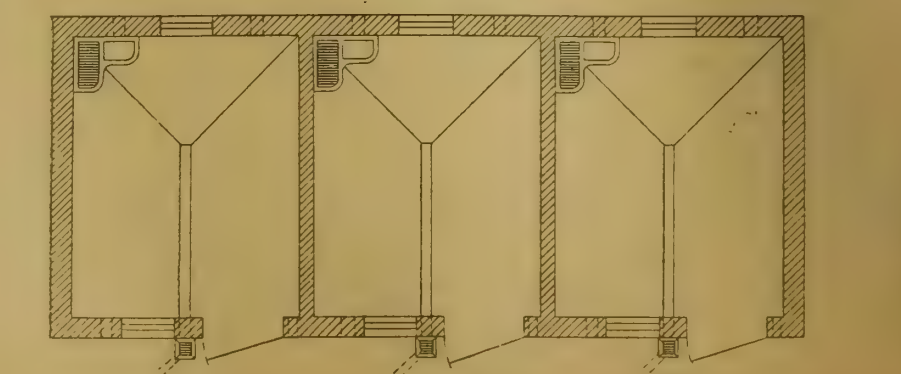
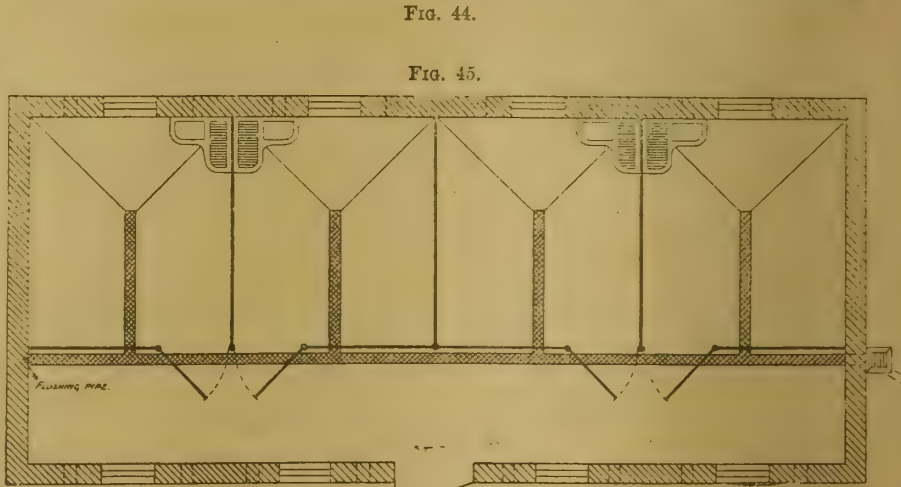
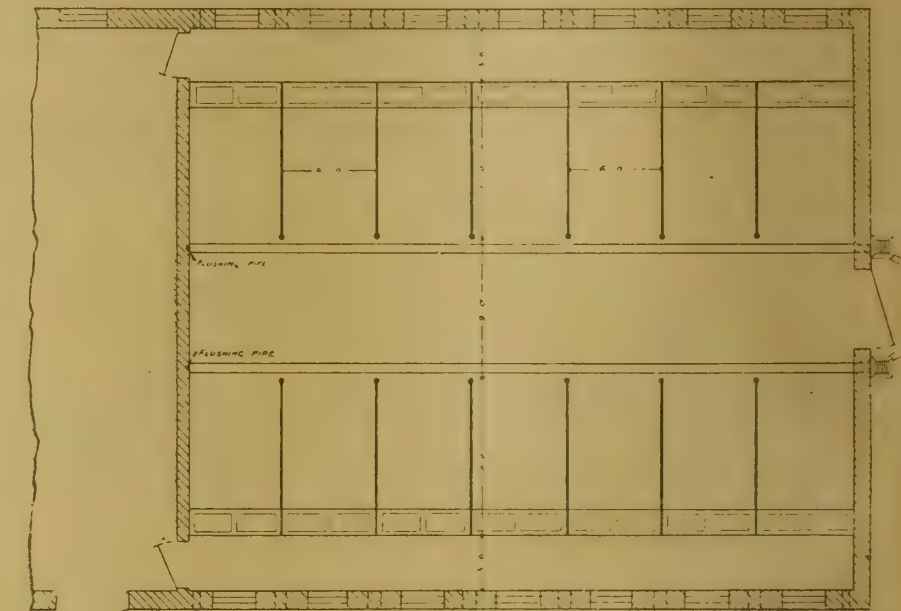
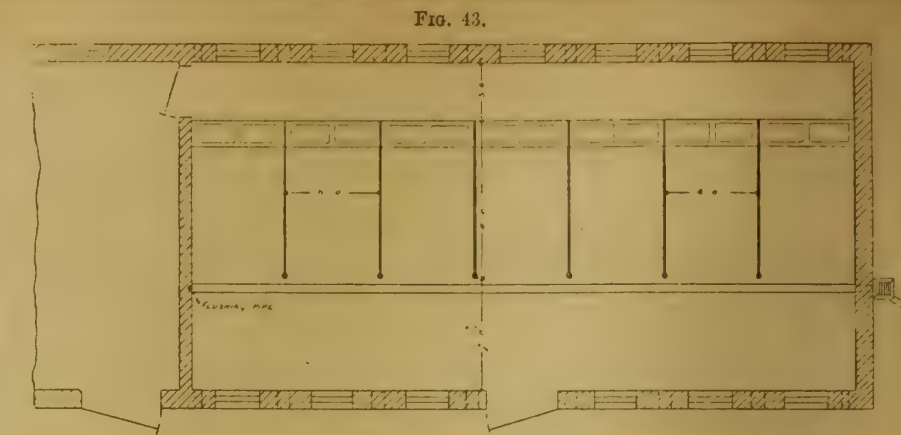
Temperature of Dew-Point.	Weight of Vapour per cubic foot of Air.	Temperature of Dew-Point.	Weight of Vapour per cubic foot of Air.	Temperature of Dew-Point.	Weight of Vapour per cubic foot of Air.
Degrees Fahr.	Grains.	Degrees Fahr.	Grains.	Degrees Fahr.	Grains.
20	1.30	44	3.32	68	7.51
21	1.36	45	3.44	69	7.76
22	1.42	46	3.56	70	8.01
23	1.48	47	3.69	71	8.27
24	1.54	48	3.82	72	8.54
25	1.61	49	3.96	73	8.82
26	1.68	50	4.10	74	9.10
27	1.75	51	4.24	75	9.39
28	1.82	52	4.39	76	9.69
29	1.89	53	4.55	77	9.99
30	1.97	54	4.71	78	10.31
31	2.05	55	4.87	79	10.64
32	2.13	56	5.04	80	10.98
33	2.21	57	5.21	81	11.32
34	2.30	58	5.39	82	11.67
35	2.39	59	5.58	83	12.03
36	2.48	60	5.77	84	12.40
37	2.57	61	5.97	85	12.78
38	2.66	62	6.17	86	13.17
39	2.76	63	6.38	87	13.57
40	2.86	64	6.59	88	13.98
41	2.97	65	6.81	89	14.41
42	3.08	66	7.04	90	14.85
43	3.20	67	7.27		

As an example, it is assumed that the dry and wet bulbs of the hygrometer read 64° and 58° Fahr. respectively ; there is consequently a difference of 6° Fahr. between the two readings. From the formula—

Dew-point =  $T_d - F(T_d - T_w)$ ,  
we have dew-point =  $64 - 1.83(64 - 58)$   
=  $64 - 10.98 = 53.02^\circ$  Fahr.

By the application of table B, it is found that the weight of vapour at the dew-point of 53.02° Fahr. lies somewhere between 4.55 and 4.71gr. per cubic foot, or as nearly as possible about 4.55gr. ; whilst the weight of vapour required to produce saturation at a temperature of 64° Fahr. is 6.59gr. Therefore from the formulæ—

Humidity =  $\frac{W}{W_1} \times 100$ ,  
we have—  
Humidity =  $\frac{4.55}{6.59} \times 100 = 69$  per cent. of saturation.  
Where practicable, the dry bulb thermometer





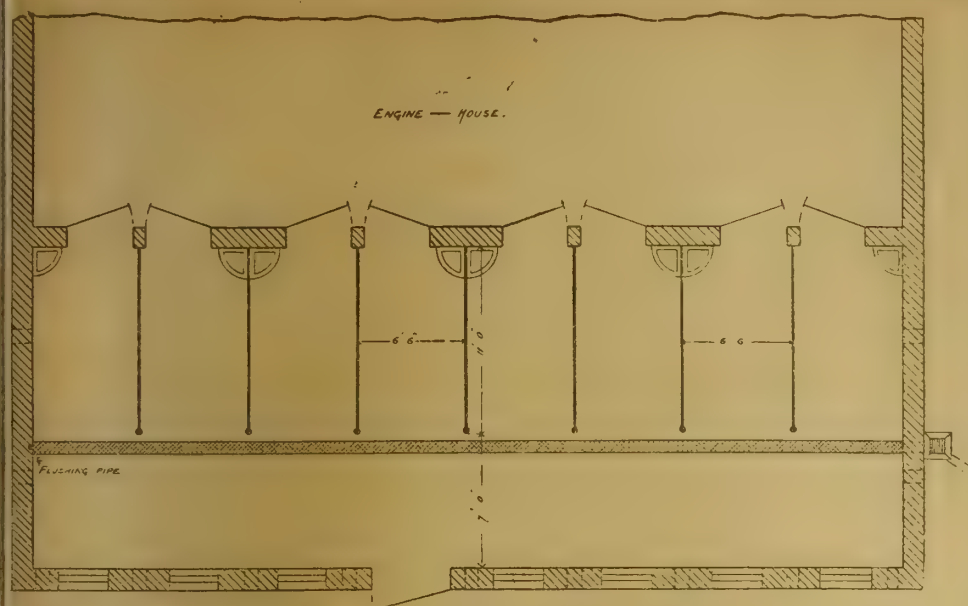


FIG. 47.

should read from 60° to 65° Fahr. and the wet bulb from 55° to 60° Fahr. The difference between the two thermometers should not be less than 4° or more than 8° Fahr. Generally it may be stated that for health and comfort a humidity of 70 per cent. should be approximately maintained.

## GENERAL PLAN.

Stables designed for a single row of stalls should have a width of about 18ft., the stall divisions being 11ft. long over all, with a passage in rear about 7ft. wide. In the case of stables arranged with a double row of stalls the central passage should be 9ft. wide, making a total width of 31ft. Frequently, however, the stall divisions are only 9ft. 6in. or 10ft. long, with a 6ft. passage for a single row of stalls, and a central passage 8ft. wide where a double row of stalls is provided; but for first-class stables this is insufficient.

For ordinary purposes the stalls should not be less than 6ft. wide; but for hunting-stables and others of a similar description it is desirable to make them 6ft. 6in. or 7ft. wide. Loose-boxes should be double the width of a stall, 12ft. being the usual width, whilst the length should not be less than 12ft. Preferably, loose-boxes should be 12ft. wide and 14ft. long.

Infirmary stables should be about 20ft. wide, the stalls being 11ft. long by 6ft. 6in. wide, with a 9ft. passage in rear. Infirmary loose-boxes should be not less than 16ft. long by 13ft. wide, so as to provide ample floor area and air space.

Fig. 41 is the plan of a stable with a double row of stalls and central passage, having accommodation for 14 horses. Fig. 42 shows the plan of a stable with a single row of stalls and two loose-boxes, with passage at rear. Occasionally a feeding-passage, about 3ft. 6in. wide, is provided at the head of the stalls, as in Figs. 43 and 44, where stables are shown arranged with a single and double row of stalls respectively; but for general purposes the feeding-passage is unnecessary. Fig. 45 is the plan of a range of four loose-boxes, such as are largely used in hunting establishments, whilst Fig. 46 shows the plan for a block of three infirmary loose-boxes.

In thickly-populated towns and cities, where space is limited, and accommodation must be provided for a large number of horses and vehicles, the ground floor is often arranged so as to afford shelter for waggons, carts, &c.; whilst the necessary stable accommodation is provided on the first floor of the building, the stables being reached by means of an inclined plane of sufficiently easy gradient to be readily ascended by horses. For tramway and omnibus companies two-story stables have been erected, in which both the ground and first floor are occupied as stables.

Fig. 47 shows an arrangement of stabling suitable for a fire-brigade station, which has been adopted with satisfactory results. It will be noticed that a door is placed at the head of each stall, which opens directly into the engine-house, so that the horses may be attached to the

engines without loss of time. In carrying out this design, it is necessary to use some form of angle-manger with overhead hayrack, whilst the angles of the door-jamb should be well rounded, or a metal roller fixed vertically at each angle, so that the horses may not be injured in the hurry of a fire-alarm.

## ADAPTABLE SPECIFICATIONS.

-XXXIV.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued.)

**THE PLASTERER** is a man who often does his work under difficulties. Neither the architect nor the owner takes him much into consideration in fixing the date by which a new building is to be completed, though they may both unfortunately find it is on him, more than on any other craftsman, that this date will actually depend. Clients do try to avoid having brickwork built in winter, though in most years winter is a better time than summer for this, because the bricks are then more certain to be wet. But clients rarely trouble themselves, at least, before the time comes, about the date at which the plasterer will begin. They want to occupy their new house in spring; they arrange to have it finished by a particular day in March, and it does not occur to them that the plastering will have to be done in December or January or February. In other cases a builder, for one reason or other, lets the first part of his work drag on slowly. The mason and the waller take things easily, and then the plasterer is expected to go on with a "rush," and make up for them. Good workmanship cannot be expected from him under such conditions. Plastering requires a certain time to set, and something approaching an even temperature to do it in. It does not answer to freeze it one day and bake it another while it is still soft, though it is often treated so when frost comes on, and great fires are subsequently lighted to drive it out. Then, again, it is on the plasterer, who has imperfections enough of his own to answer for, that the carpenter's sins are very often visited. Timbers that shrink and timbers that sag do not make much show while nothing but woodwork depends on them. Lath them over and plaster on them, and their faults appear even in exaggerated forms, on the unyielding surfaces that have been added, and the evil that they do lives after them, or, at least, after they have been permanently hidden away from sight.

The first necessity, then, for good plastering is a good structural groundwork to put it on. Where this groundwork does not exist, a substitute is sometimes provided, which is meant to carry nothing but the plastering itself. Thus, where the walls let the wet through, they may be battened or lathed or "stripped," as the name is in some places, strips of wood being fixed to the inner wall-surface, and the laths being nailed on

these. Ceilings may be made secure in a similar way by fixing them, not to the floor-joists, but to ceiling-joists separately supported, and too small in scantling to shrink materially. Yet, even when this is done, or when there is no need to do it, plastering may be spoiled by improper lathing. First of all the joists or quarterings should be tried with a straightedge to see that they are all level on the side to which the laths will be fixed. Projections should be adzed off, and sinkings made out by "firing up," or affixing strips of wood of the necessary thickness. Where the lathing runs over a joist or other timber more than 3in. thick this timber should be counter-lathed—that is, a narrow fillet should be nailed to the centre of it, and the laths should be nailed to this fillet. They should be about  $\frac{3}{4}$ in. apart and not closer, or the plastering will not be able to pass between them and a proper "key." The laths should break joint, or, as plasterers call it, be "matched"—that is, when the ends of two or three dozen laths have been nailed to any particular joist or quartering, the next two or three dozen should run across that joist on to another one, and so on alternately. The end of one lath should not be nailed down upon the end of another, so as to make at this point a double thickness. This is often done in haste or carelessness, and then, to make the ceiling level, a great deal more stuff is used in it than there is any occasion for. Over-thick ceilings are bad ceilings. They are generally the result of imperfect preparation, of uneven timbers, over-nailed laths, and similar products of bad workmanship—all of which the inferior plasterer thinks he can disguise by varying the thickness of his ceiling in different parts. Uneven thickness, however, generally means unequal setting, and an unnecessary drag on the lathing. These thick ceilings crack and sometimes fall, and where this happens in a lofty apartment the damage they do may be very serious.

Many of the faults of wooden lathing may be avoided by using metallic lathing. Helical steel lathing is strong, and affords a good key for the plaster, in which it should be thoroughly imbedded. It can be had in sheets of any size, the ordinary one being 10ft. 6in. by 2ft. 6in. The sheets can be joined together without the use of wire. When made, as it easily can be, of the requisite strength, it forms very light and yet rigid partitions, and has been much used in hospitals and public buildings. The "Jhilmill" metal lathing may be described as formed of thin sheets, slightly corrugated, and so slit that narrow strips of the metal project part on the upper, and part on the under, surface, across the ridges and furrows alternately. This material is recommended for fireproofing, and has been used at the Lyceum, the Savoy, and several other London theatres. "Expanded metal" in other forms and various combinations of wire have also met with success, and if they were able to compete with it in price, some of them would soon supersede ordinary wooden lathing.

A satisfactory foundation for the plastering having been in one way or another provided, the next thing is to see that the plasterer's materials are what they ought to be. When that workman is careless or hurried, he likes to save time by "running" the lime for his "coarse stuff"—that is, for the stuff of which his first and thickest coat consists. But to make first-rate work, the lime for this purpose should not be run. It should be prepared a month or two before it is wanted, so that every particle of it may be sure to be soaked, and that there may be no subsequent danger of blistering and blowing the face of the work off. The lime should be spread out on a hard surface, water should then be sprinkled over it, and it should be covered up in a heap with sand, and so left, protected from rain, for some weeks. When the slaking so managed is thorough and complete, the lime and sand are to be mixed and passed through a sieve, and the mixture is then ready to be made up with water for the plasterer's use. But it does not do to hurry this process, or bits of unslaked lime will remain in the plaster, and in a few weeks after it is finished will be likely to adorn its surface with innumerable pits and cavities. Therefore the plasterer, when he has not gone about his work soon enough, finds it safer to treat the lime for his "coarse stuff" just as he usually and properly does that for his "fine stuff"—the material for his final or "setting" coat. That is to say, he "runs" it, which means that instead of merely sprinkling and allowing it to stake gradually, he mixes it at once with a great excess of water, so that the mixture is only about

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as thick as cream, and that he then allows it to stand for a short time, till the excess of water passes away, and the slaked lime is left as a comparatively solid paste. This process is all very well for the "setting," or, as they call it in the North, the "skimming" coat, which is thin, and does not require much cohesion, and as it insures the thorough saturation of the lime with water, it prevents the danger of "blistering" by means of unslaked particles. In other words, it saves time and trouble. But coarse stuff made up with lime which has been "run," is not nearly as strong as that in which it was slowly slaked with only a sprinkling of water, and the wall surfaces and ceilings which are "rendered" or "laid" with it will never be nearly as hard and firm as they ought to be. This hasty preparation of the lime is the ultimate cause of many failures in plasterers' work, and one thing which the superintending architect should always see to is, that the plasterer comes on the ground and begins his preparations a long while before he will have to put his work into the building.

The quality of the sand is as important as that of the lime. Coarse river sand, like Thames sand, is too "short" to be suitable for the plasterer. Road sand sets better; but an almost insuperable objection to it is found in the animal substances which it contains. These, no doubt, can be washed out of it, but this washing takes time and labour; while the mere exposure, for a few months, to the action of the weather, which the plasterer sometimes substitutes, cleanses the sand but very imperfectly. Soluble nitrates will then remain in it, and will enter into the composition of the plastering; they will attract moisture from the air, and will keep the walls and wall-paper constantly damp. It is not a pleasant prospect, either, for the tenant of a house plastered with road sand to think that he will have to pass his days in apartments whose walls and ceilings are, whether perceptible or not, always giving off such vapours as arise from manure-heaps and stable drainage. Sharp pit sand, not too fine or soft, and sand screened from gravel, will make good plastering if no clay loam or other impurities are present. Where they are difficult to obtain, a substitute may sometimes be provided by grinding up soft, sandy red brick-bats with the lime. This composition will set hard and rapidly; but burnt clay without sand will not prove satisfactory. Whatever the coarse stuff consists of, it should have evenly mixed in it an ample quantity of long hair, free from grease. A pound of hair to three cube feet of mortar is generally considered enough, and its presence or absence can be ascertained in a rough way by taking up a little of the coarse stuff on a spade and seeing if the hair hangs over the edge of it. The hair in modern plastering is generally too short, and often rotten. For plastering which is not going to be coloured over or papered on, the colour of the sand is important. Where nothing but a whitish sand can be obtained, some cheap permanent colour, such as one of the natural ochres, may be mixed in the setting coat.

The first coat of coarse stuff on walls is called "rendering." If the mortar in the joints of the brickwork does not project enough to form a "key" for it, those joints should be well raked out to allow it to enter; and if the wall is an old one, which has been pointed, or if it consists of large and nearly flat rubble stones, it should be picked over and roughened, that the first coat may hang to it. Unless the wall has been so recently built as to be still very damp, it should also be well wetted before the plaster is applied. This wetting is specially necessary before applying Portland cement. The first coat on lath is called the "pricking-up." It should not be thicker than is necessary in order to bring it to a fairly even surface. The stuff should be thin enough to be easily worked through between the laths, and yet thick enough to hang there by means of the projections which it forms on the back of them. The first coat, whether on walls or on ceilings, is roughened over with a birch-broom, or scratched with a lath before it hardens. In two-coat work, called, as the case may be, "render and set," or "lath, lay, and set," a thin coat of "fine stuff," that is, of pure slaked lime, or of lime with a small quantity of white hair, is now put over the first coat and worked smooth, and the plastering is then complete. In three-coat work, which, in modern practice, is used for everything except the commonest and most inferior purposes, what comes on the rendering or the pricking-up coat, is the floating. The object of this is to bring the whole work to a

perfectly true and uniform surface. This is managed by surrounding the surface with narrow strips of plastering, called screeds, executed in coarse stuff, and carefully levelled or plumbed so as all to lie in the same plane. When this object has been secured, the space within the marginal screeds is again subdivided by other screeds, all accurately set out in a plane; and finally, the spaces between the screeds are filled in so as to be flush with them, and floated level. When the floating coat is no longer very soft, it is brushed over as the previous one was. But it must be allowed to dry thoroughly before the last, or setting coat is added. This coat, which is formed of fine stuff, as it was in two-coat work, is very thin, and therefore dries fast. If it is put on too soon it will dry and get hard before the floating coat under it has done shrinking, and then one of two things is likely to happen. If the floating and setting coats adhere to each other strongly, the latter will be full of small cracks from the shrinkages beneath; while if the two do not adhere well, there will be hollow places between them, and parts of the setting coat will be liable to fall.

#### THE SURVEYORS' INSTITUTION.

AT the above society's temporary premises, in Savoy-street, Strand, an interesting paper was read on Monday evening last by the Right Hon. Horace Plunkett, M.P., on "Agricultural Co-operation," dealing especially with the very successful experiment in Ireland of which the author of the paper was the moving spirit. Mr. Plunkett laid it down as an obvious truism that at the present time some sort of combination, which had been adopted in almost every industry but agriculture, was necessary to enable us to compete successfully with our foreign rivals. The theory that protection would account for the success of foreign producers in our markets he held to be untenable, and he founded his opinion on the case of Denmark, which was a purely agricultural and a free-trade country. Technical education, again, was only taken advantage of when communities were first highly organised. All over Europe there were such voluntary associations of agricultural workers as he advocated, and their operations had been attended with the best results to themselves. The organisation of the agricultural classes was everywhere recognised as the best guarantee for the sound administration of State aid, and, on the other hand, as the most powerful lever for obtaining such aid. The farmers of France, Germany, and Austria can, being organised, practically obtain what laws they please, to the cost, as Mr. Plunkett pointed out, of the helpless British farmer. It was only some years ago that a few Irishmen decided to endeavour to teach the people that their welfare depended rather on their own efforts than on Governmental or external aid, and they selected agriculture as the industry on which they would try the experiment. The decline in, for instance, the butter trade of Cork, which 20 years ago was an immense one, was not due to the deterioration of the Irish produce, but to the improved methods of the Continental farmers, who by judicious combination were enabled to use all the modern appliances, and to insure uniformity of results, which was impossible in the case of small men working alone. As an outcome of the movement, there were now in operation in Ireland 58 co-operative dairy societies, having an output of some £300,000 a year, and a membership of about 7,000 farmers. Mr. Plunkett went into details of the working of these societies, and their "creameries" of too highly technical a character to be dealt with here; but one suggestion which struck us as being particularly practical was the immense advantage to be derived from the use of decimal calculations in all such businesses, dealing with the interests of a number of persons, each having a different stake in the concern. As he pointed out, the difference of, say, 3½d. and 3¼d. on some hundreds of thousands of small transactions was so great that, in the bulk, it represented a wide margin of profit or loss. He advocated going into two places of decimals in dividing such small sums, and argued very truly that these minute calculations, showing as they did the cumulative value of carefulness in small things, could not but have a good educational effect on people who were only too apt to reckon roughly. The object of these societies was not to make a profit, but to save the profit which was generally wasted. The members were able, for instance, to obtain the necessary manures, &c.,

in large quantities, and with a guarantee of quality, to insure, as he had said, regularity of quality, and what was perhaps as important as anything, to be able, by insuring a regular traffic in considerable bulk, to obtain from the carrying agencies better terms and more regular delivery than the small individual producer could expect. It was not because the railway companies wished to favour the foreigner, said Mr. Plunkett, later on, but because, in the very nature of things, they could afford to carry large consignments at regular intervals and between fixed points, much cheaper than casual small parcels, that the rates seemed in many cases against home produce. He mentioned a case in which five societies clubbed together to purchase £14,000 of artificial manure for their members, saving some £5,000, and having a certainty as to what they were getting for their money. The same applied to the quality and prices of seeds, implements, and other farming requisites. The sales by these societies in Ireland rose from £45,000 in 1893 to nearly £111,000 in 1896; while the membership, which had been 50 in 1889, was now about 14,500. The system which had been such a marked success in so short a time among the farmers of Ireland ought, he felt sure, to do something to relieve the distress from which agriculture in England was now suffering. If it could only be established in a few typical districts, its success would soon lead to its adoption on a much larger scale. The conditions in the two countries were certainly dissimilar, but the same principles applied. Co-operative purchase of requisites, co-operative distribution of products, and co-operative credit, and the reduction of freight and carriage would, he was sure, do more to solve the problem of agricultural depression than any political panacea. In Ireland there had only been one case of failure, and that was where the members of the society, being composed of two different political parties, had, after making some hundreds of pounds in the first year, lost a much larger amount in the next twelve months by devoting themselves to the discussion of Parliamentary rather than practical affairs. He felt sure such a system as had succeeded, and was rapidly growing in Ireland, if only the English farmer could be induced to adopt it, would also succeed here.

In proposing a vote of thanks to Mr. Plunkett, Mr. J. W. Fair said he quite agreed that co-operation among farmers was a very difficult thing to start. They had a certain amount of distrust of each other and of themselves, and would, he thought, be very slow to understand the advantages of such a system, unless by its success in a typical district they could be convinced that it was beneficial to their interests. As a member of the Lancashire County Council, he had taken much interest in a dairy farm established under their technical education scheme; but although the younger members of the farming class could be taught, he found that very little could be done with the older ones. His experience was that farmers would willingly meet to discuss such ventures, would promise to support them if established by the landlord, but would not subscribe any of the necessary capital. But he had heard of one or two successful schemes of the kind which, the first prejudice having been overcome, had been made to pay well.

Mr. R. H. Rew (secretary to the Central Chamber of Agriculture) said that he had brought to his notice from time to time many schemes for the salvation of British agriculture, embodying many excellent ideas; but so far as he knew none of them had succeeded, and he feared that the reason of their non-success was that in England there had arisen no Mr. Plunkett. The first serious step had been taken by Lord Winchelsea with apparently a good prospect of success, several local associations to those in Ireland having been already formed.

Lord Montagu, as one of the promoters of the Irish scheme, said that although a good deal of difficulty had been anticipated in getting it adopted by the practical farmers of the northern parts of Ireland, it had gradually made headway there, and even during the last year had made great strides, and had experienced singular success. It had been of benefit to the larger farmers in that they got their implements and manures and other requisites cheaper and of better quality; and to the small men by enabling them, besides these things, to get a better and more regular market for their produce.

Mr. Arnold Foster, M.P., said that although he was not in any sense an agriculturist, and did



not even represent an agricultural constituency, he had taken great interest in the progress of co-operation in other directions, and from his experience, and from the facts which were given in the paper, he felt sure that it was the one hope for agriculture, if it were to compete successfully with highly-organised foreign rivalry.

Captain Saunders, Captain Loftus Bryan, Lord Addington, and Mr. H. W. Wolff having spoken, Mr. Plunkett briefly replied on the discussion, and the meeting then adjourned.

#### ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors to the funds of this society was held, on Wednesday afternoon, in the Council Room of the Royal Institute of British Architects, Professor Aitchison, A.R.A., the president, occupying the chair.

The annual report of the council was read as follows:—

The council of the Architects' Benevolent Society, in the reports which they have submitted to the annual general meetings during the last few years, have been able to comment favourably upon the growing appreciation amongst architects generally of the good work accomplished by its efforts, and of the larger measure of support which it has received. Last year they had to lament the death of some of its oldest and most liberal contributors, and it was to be feared that the income of the Society would suffer a serious diminution in consequence. It is, therefore, with considerable satisfaction that they are able to announce that the progress recently made by the Society has, during the past year, been maintained. This is to be largely attributed to the appeal issued by Mr. Penrose, the late president, in the early part of last year, to every architect in practice in the United Kingdom. Besides many handsome donations, the appeal was successful in adding some 40 new names to the list of annual subscribers, and in obtaining increased subscriptions from some who were already liberal contributors. The council wish to record their great indebtedness to Mr. Penrose for the trouble which he took in connection with the issue of this appeal, penned as it was on the very evening of his departure for Athens. Still, although the council have considerable satisfaction in noting the increase of annual subscriptions in recent years, they feel that the sum received is yet inadequate, in view of the fact that applications for assistance are made from all parts of the country; and they would point out that against the sum received last year in annual subscriptions, £460 15s., no less than £569 10s. was expended in grants, and to this sum should be added £35 advanced by the hon. treasurer toward the close of the year, when it was impracticable to convene a council meeting to relieve the urgent needs of worthy applicants; so that the actual sum expended in relief during the year was £604 15s. This sum, however, does not include the £70 dispensed in pensions, which are paid out of the income derived from investments.

With regard to the capital account, there was a balance at the beginning of the year to its credit of £117 15s. 8d., and during the year the sum of £333 12s. was received in donations. It was, therefore, thought well to increase the investments of the society by the purchase of £250 Caledonian Railway 4 per cent. debenture stock, at a cost of £386 17s. 6d., thus leaving a balance in the hands of the bankers on the 31st December of £64 10s. 2d. This purchase increases the value of the society's holdings of stock to (at cost) £9,893 0s. 4d., which, with the balance at the bankers, leaves the total capital at £9,957 10s. 6d. Successive councils who have administered the affairs of the society have for many years made efforts to increase the capital of the society to £10,000, and it is a matter of satisfaction that the investments have now practically attained this point of stability, their value, indeed, at market quotations being in excess of this sum. The council have to announce, with great regret, that they have received an intimation from Mr. Arthur Cates, of his intention of resigning the honorary treasurership, a position which he has held for seven years, and which has enabled him to render invaluable services to the society. Mr. Cates has not only been a liberal donor and subscriber to the funds of the society, he has also promoted its usefulness by the exercise of his influence in its behalf, by the time and labour which he has always been willing to expend on

its affairs, by the interest which he has taken in cases that have come before the society for assistance, and by a just appreciation of the most advisable way of helping necessitous applicants. During Mr. Cates's term of office the affairs of the society have year by year steadily progressed, and it will be no doubt a matter of satisfaction to him to know that he leaves it in a more prosperous condition than when he undertook office. The council duly recognise that the present favourable position of the society's affairs is largely due to his administrative qualities. At the same time, while this has been effected, it has not been attained by parsimony in affording relief to applicants, or by want of the proper exercise of beneficent usefulness for which the society was inaugurated and for which it exists. When Mr. Cates undertook the treasurership the number of subscribers was 208; it is now 309. The amount received in annual subscriptions was £308; it is now £453. The amount of invested capital was £7,426 2s. 4d.; it is now £9,893 0s. 4d. It remains to be added that in 1893 Mr. Cates issued a personal appeal to the architectural profession for donations and subscriptions, with a gratifying result. The following gentlemen, being the five senior members, retire by rotation from the council, namely: Mr. T. M. Rickman, Mr. R. St. Aubyn Roumieu, Mr. J. T. Wimperis, Mr. Thomas Harris, and Mr. H. C. Boyes. To fill the vacancies caused by these retirements and by the retirement of Mr. W. Hilton Nash, the council have the pleasure to nominate Mr. Arthur Cates, Mr. Aston Webb, Mr. H. L. Florence, Mr. J. T. Christopher, Mr. Sydney Smirke, and Mr. William Grellier. To fill the vacancy caused by the retirement of Mr. Arthur Cates, the Council beg to nominate Mr. W. Hilton Nash for the post of honorary treasurer.

The hon. treasurer, Mr. Arthur Cates, read the statement of accounts and balance sheet.

Mr. H. H. Collins moved and Mr. Zeph. King seconded:—That the council for the year of office 1897-98 be elected as follows:—The President of the Royal Institute of British Architects, president; Messrs. Wm. Kidner, Geo. Seamell, Zeph. King, George Inskipp, Colonel R. W. Edis, Arthur Crow, E. A. Gruning, G. T. Hine, Arthur Cates, Aston Webb, H. L. Florence, J. T. Christopher, Sydney Smirke, and Wm. Grellier.

The resolution having been agreed to, a cordial vote of thanks to the retiring treasurer, Mr. Arthur Cates, who did not desire re-election, was moved in eloquent terms by the President, who spoke of the great benefit which the Society had derived from Mr. Cates' seven years' official connection with it, and of the great improvement both with regard to membership and financial stability which had occurred during the same period, and of the great regret with which his resignation was received. Mr. Zeph. King seconded, and Mr. H. H. Collins supported, the motion, which was carried with acclamation.

Mr. Cates, in replying, trusted that the Society would receive further support from the architectural profession than had hitherto been the case.

Mr. W. Hilton Nash was elected hon. treasurer for the ensuing year of office, and Mr. Percivall Curry re-elected to the honorary secretarieship.

A vote of thanks having been passed to the retiring auditors, Mr. Henry Hall and Mr. Wm. Woodward, and to the president, the proceedings terminated.

#### HORTICULTURAL BUILDING.

MESSRS. MESSENGER AND COMPANY, horticultural builders and heating engineers, of the Midland Horticultural Works, Loughborough, and Victoria-street, Westminster, have issued a book on horticultural buildings, their ventilating and heating, with designs executed by the company, and the prices. The best and most practicable types of glass houses are illustrated, from the simple pit to the elaborate winter garden. Each of the designs is accompanied by a plan of the conservatory, showing its connection with the house. The book contains not only designs, but remarks on construction and the warming and ventilation of horticultural buildings, and these latter are particularly worth attention by all builders and architects. A large-size section of one of the houses, showing the arrangement of the sashes and mode of opening the lights, is given. Messenger and Company have judiciously combined, in the construction of these buildings,

wood and iron, by which the more solid appearance of wood structures is combined with lightness and strength. Ventilation is devised in the upright front by means of framed lights hung to the iron muntins with special hinges. The ventilation of roof is managed by a light hung to the ridge. These lights can be opened in lengths of 150ft. or more by means of patented apparatus. The upright framing of the buildings is composed of cast-iron muntins, while bracket-heads are screwed into the sill. These details are amply explained and illustrated in this book of 120 pages. We notice also designs for three-quarter vineries and plant-houses, with prices affixed for different widths, accompanied by sections, lean-to greenhouses, forcing-houses, peach-houses, and glazed covers for front walls, greenhouses for amateurs, cucumber and melon-frames, &c. Messenger and Co.'s patent improved lever apparatus for opening long ranges of top ventilators, ventilating tackle, and the various appliances are illustrated, and the prices of sets of different lengths given. Other pages illustrate cast-iron ridge castings, ornamental finials, spandrels; and the section on heating by hot water or steam applies to all buildings. The "Loughborough" boiler, radiators, and other fittings are also illustrated and prices appended.

#### CHIPS.

Sanctuary standard lights and a stained-glass window, placed in Ladock Church in memory of the late Canon Wise, who was for 30 years rector of the parish, were dedicated on Sunday last by the Archdeacon of Cornwall.

It is stated that the carriage works of the new Great Central line to London will be at Leicester. At Woodford, near Banbury, locomotive sheds and other works, covering sixty acres, will be erected.

A block of new buildings has been added to St. Mary's Baptist Chapel, Norwich, covering the corner site facing Duke-street and St. Mary's-plain. The new buildings, which are of red brick with white brick dressings, agree in style with the old Sunday-schools. On the ground floor, a church parlour, about 28ft. by 22ft., a Bible-classroom, 25ft. by 18ft., and two classrooms, each about 14ft. square, have been provided. A ladies' cloakroom has also been added. Connections have also been made from the new buildings to both the chapel and old schools. On the first floor there is a lecture-hall, about 42ft. by 27ft., and seating about 200 persons. Connected with the lecture-hall are three classrooms. The building is lighted by electric light, installed by Messrs. Lawrence, Scott, and Co., and heated by hot water by Messrs. E. G. Reeve and Sons. A cottage has also been provided for the caretaker. The work has been carried out by Messrs. J. Youngs and Son, Norwich, under the directions of Messrs. Edward Boardman and Son, architects, of the same city. The outlay has been £3,000.

The directors of the London and North-Western Railway Company have adopted plans for a new station at Lancaster, which will involve an expenditure of between £40,000 and £50,000.

It is proposed to erect in the north-west corner of the nave of Canterbury Cathedral—near to the tomb of the late primate—alabaster slabs having upon them the names of the Archbishops of Canterbury from St. Augustine down to the present time. Upon corresponding slabs will be inscribed a similarly complete list of names of the Priors of Canterbury and their successors—the Deans. The work is already in hand. New stained-glass windows are also to be placed in the clerestory of the north-east transept of the choir, opposite the Archbishop's throne.

The tower of Broad Clyst Church is about to be restored, the pinnacles renewed, and the peal of bells raised from six to an octave. Mr. E. H. Harbottle, of Exeter, is the architect.

The Sewage Committee of the Glasgow Corporation have appointed a sub-committee to consider the disposal of the sewage on the south side of the Clyde, with the view of promoting a Bill in Parliament next session to secure compulsory powers.

The tunnelling under Lord's Cricket Ground at St. John's Wood, London, for the new Manchester, Sheffield, and Lincolnshire line, is now completed, and the three tunnels which the company was under contract to cover over by April of this year have been already hidden from sight by a layer of earth which will be turfed long before that time.

At Ballyhooley last week, the ceremony of cutting the first sod of the new storage reservoir, for the supply of water to the town of Larne, which is being constructed at an estimated cost of £5,000, was performed by the Chairman of the Board of Commissioners for Larne. The contractors are Messrs. Heggarty and Gault.



## Building Intelligence.

**THE ALHAMBRA.**—An eastern extension, including a new façade fronting Charing Cross-road, with richly-decorated entrance from that thoroughfare, has been made to the Alhambra music-hall, and was formally opened on Tuesday. The style adopted is a Moorish type, the stone used for the façades is from the "Doulting" beds (Somersetshire), the lower portion of the front being in red Aberdeen granite, relieved by carved spandrels reproduced from the interior dome. The circular vestibule panellings have been treated with Pavonazza, Devonshire, and other marbles, with the slender columns in Sicilian, the whole treated in florid Turkish and Cairine styles, the ceiling decorations being identical with a treatment of one of the saloons in the Viceroy's palace at Cairo. The newels and banisters to staircases have been especially designed by the architect in the same character. The fibrous plaster, friezes, reliefs, and panellings have been specially modelled from originals in the Alcazar and Alhambra palaces of Seville and Granada. On either side of the arches are stalactite pendentives adopted from Moorish designs. A shelter has been erected in front of the new vestibule entrance, the columns and caps of which have been adapted from the Hall of Justice in the famous Alhambra, Granada, reproduced by Messrs. Hart, Son, and Peard, of Drury-lane, W.C. The doors of the grand entrance, including corridor, vestibule, scene dock, and residence, are reproductions of an old Moorish carved work. The walls of the grand entrance corridor have been treated in exceptional richness. The tiles, which have been adopted in great variety, are identical with those at present being used for the renovation of the Alhambra and Alcazar Spanish palaces, and were specially selected by Mr. Alfred Moul, the general manager, during a visit to Spain in the early part of last year. The tiles are the manufacture of the Spanish potter-artist, Mensaque, intrusted by the Spanish Government with the renovations of their historic and magnificent palaces. A new subway has been constructed for the convenience of the public for passage from the corridor to the north side of the auditorium for all reserved stalls and private boxes. The whole of the decoration of the subway is a faithful reproduction of sections of Granada Alhambra decoration, carried out in fibrous plaster. The entire work has been designed, and its execution superintended, by the Alhambra Company's architect, Mr. W. M. Bruton, of Trafalgar House, Green-street, Trafalgar-square, the contractor being Mr. H. L. Holloway, of Deptford (Mr. Weymouth, chief foreman). The decorations of the vestibule and corridor by Messrs. S. and S. Dunn, of Brewer-street (Mr. Walters, chief foreman); the special stencilling and decorations of subway by Mr. Watson, of Kingston; electric lighting by Messrs. F. W. Henton and Co.; and the heating by Messrs. Berry and Co. We illustrated the front in our issue of Oct. 30, 1896.

**EDINBURGH.**—The Plans and Works Committee of Edinburgh Town Council have adopted plans by Mr. Morham, the city architect, for the new central fire-station to be erected at the south-west corner of the Cattle Market. These show a range of buildings, three stories in height, in the Renaissance style of architecture, with a high tower in the rear. The design comprises an engine-house for four fire-engines, stabling for six horses, duty-room, private and clerks' offices for the firemaster, gymnasium, recreation-room, and baths for the firemen, workshops for the engineers, joiners, and painters, quarters for nine single men, and dwelling-houses for 21 married men, residence for the firemaster, a hose-tower, and stores and boiler-houses. The engine-house is 52ft. long, and consists of four bays each, with a door 9ft. 3in. wide and 12ft. high, so that an engine can pass out with the horses at full gallop. The duty-room is 26ft. by 16ft. The gymnasium is 39ft. by 22ft., and the recreation-room 24ft. by 22ft.; these being used as sleeping rooms for the men on night duty. In the upper portions of the central building are the washhouse and laundry, and on the same level baths are to be provided. The hose-tower is situated behind the duty-room, and rises to a height of 100ft. Mr. Morham has also submitted plans to the committee showing the suggested rearrangement of the Cattle Market in consequence of the erection of the new fire-station. The estimated cost of the buildings, exclusive of the site, is £23,500.

**INKPEN.**—The parish church was reopened after restoration last week. The work has been carried out by Messrs. G. Elms and Sons, builders, of Benham, Newbury, under the direction and from the designs of Mr. Clapton C. Rolfe, of Oxford. A north aisle has been added, and also a south porch, with an oak roof, covered with lead, and having the Entombment of our Lord carved on its eastern exterior wall. Internally, a feature of the restored church is the new rood-screen of local oak. It is designed in the 15th century style, and is groined to carry the rood. The cross is foliated at its ends, and therein occur the symbolical figures of the Four Evangelists. The full height to the top of the cross is 21ft., and to the top of cresting upon the rood beam, 12ft. The screen proper is divided in three bays on each side of the doorway, and the gates of pierced tracery have wrought gunmetal fittings. The three statues forming the rood are just under life-size. The floors of the nave and aisle are of wood blocks, whilst the ancient tiles preserved are incorporated with slate and Sicilian marble, of diagonal pattern, into the chancel floors. The brass lectern is by Messrs. Singer and Son, of Frome. The interior walls have a dado around of Ham Hill stone ashlar. The pulpit is of carved oak, placed upon a Ham Hill base. The altar has a carved front of oak. Its mensa is of Ham Hill stone. The central group of sculpture upon it shows the Blessed Virgin and SS. Margaret and Frideswide, whilst there are four full-length statues, in high relief, upon the jambs. In the oak open-timbered roofs on the purlins, are carved angels, almost life-size. Throughout the works Mr. J. Purdie has been foreman to Messrs. Elms and Sons, the contractors, and Mr. H. Turner-Hems has represented Messrs. Harry Hems and Sons, the sculptors, upon the spot.

**MARYLEBONE.**—The Duke and Duchess of York visited St. Marylebone on Saturday afternoon for the purpose of opening the new public baths and washhouses. The new baths occupy the site of the old ones in the Marylebone-road. They comprise four swimming and 101 private baths, and in addition a large public washhouse and laundry have been provided capable of accommodating 74 women, and covering an area of 76ft. by 64ft. Facing Seymour-place is a large, first-class Pompeian bath, 100ft. in length, with a water capacity of 83,000 gallons. Arrangements have been made for covering the bath with a substantial floor during the winter months, so that it may be converted into a gymnasium. The building has been constructed by Mr. C. Wall, of Lot's-road, Chelsea, from designs by Mr. A. Saxon Snell, F.R.I.B.A., and it is lighted throughout by electricity. It was illustrated by an elevation and plans in our issue of Nov. 15, 1895.

### COMPETITIONS.

**COLCHESTER.**—The town council decided, at their last meeting, that six architects—of whom Mr. E. W. Mountford, of London, and Mr. Brightwen Binyon, of Ipswich, should be two—be invited to submit competitive plans and estimates for a new town hall, and that premiums of £100, £75, and £56 be offered for the three best designs.

**DUMFRIES.**—The school board had before them, on Monday, competitive plans by four local architects for a new elementary school to be erected on a site off George-street, and to take the place of the present Greensands School. The plan of Mr. A. B. Crombie (sent in under the *nom de plume* "Midsteeple") was unanimously adopted. It provides accommodation for 600 pupils, and is estimated to cost £6,000. It includes a campanile, which the architect suggests might be erected as a memorial to the Queen's Diamond Jubilee.

**MARKET WEIGHTON PUBLIC HALL.**—The sub-committee of the parish council, at their last meeting, resolved to adopt the designs submitted under the motto of "Simplicity" for their new public hall, to be erected at Market Weighton. On the sealed envelopes being opened, the authors of the selected design were found to be Messrs. Gelder and Kitchen, architects, of Hull, who have been instructed to carry out the work.

**RAUCEBY, KESTEVEN.**—The plans of Mr. G. T. Hine, of Parliament-street, London, for the county asylum for Kesteven, Lincolnshire, have been adopted by the committee. The estimated cost of the work is £96,000. A premium of £150 for the second best plans has been awarded to

Messrs. Giles, Gough, and Trollope, Craven-street, London, and the premium of £100 to Messrs. H. Crisp and Oatly, of Bristol. It is anticipated that the erection of the asylum will occupy three years. It is to be built at Rauceby, near Sleaford.

**SCARBOROUGH: PROPOSED WESLEYAN COLLEGE.**—Five sets of plans were sent in by local architects for the premiums offered—viz., £50 and £25, in connection with the proposed Wesleyan College on the Weaponess Estate, South Cliff. The award has been made, the first premium being awarded to Messrs. Hall, Cooper, and Davis, Westborough, Scarborough, and the second premium to Messrs. Tugwell and Barry, Westborough Scarborough.

**THE NEW HIGHER GRADE SCHOOL, SCARBOROUGH.**—Mr. Edward R. Robson, F.S.A., the architect to the Education Department, who was asked by the Scarborough School Board to judge the plans sent in for the erection of the new Higher Grade School, has made his award. The first place is taken by Messrs. Hall, Cooper, and Davis, Westborough, Scarborough, the second place by Messrs. Demaine and Brierley, of York, and the third by Messrs. Marshall and Dick, Newcastle-on-Tyne. Thirty-six sets of drawings were sent in, and they have been arranged in the Old Town Hall, St. Nicholas-street, for inspection. To-day (Friday) has been set apart as a private view day for the architects, but to-morrow they will be open to the public. In the selected designs, having in view the very great fall in the ground, the planning of the school has been arranged with the idea of avoiding, as far as practicable, unnecessary cost in the construction of the foundations, as well as the appearance from the south aspect and the remainder of the land adjoining the public park. One-third of the western side of the site has been reserved, in accordance with the conditions, and the school is placed in the centre of the remaining ground. The north side of the site has been levelled, and forms the approach road directly connected with the Valley Bridge-road at the north-east corner. The boys' and girls' main entrances are placed on the approach road, and are connected to the schools by bridges placed across the area formed to light the basement. Entrances for both boys and girls are also placed on the south side of the site entering direct from the public park. A portion of the site on the south side of the buildings has been levelled off and asphalted for the purposes of a playground, whilst it is proposed to lay out the remaining portion of the site in terraces, lawns, and walks. The basement—14ft. high in the clear—consists of a gymnasium, 20ft. high. There is also a laundry, consisting of ironing and washing-rooms with dryers, for the instruction of 40 girls in two classes. Immediately adjoining this is the cooking kitchen, with scullery and pantries abutting on the main girls' staircase. There is accommodation in the cooking kitchen for 36 girls. Towards the east side there are two dining-rooms, with accommodation for 12 children each. Adjoining the boys' dining-room is a spare classroom, and adjoining this is the elementary joiners' shop, with accommodation for 20 boys, and an advanced joiners' shop with accommodation for another 20 boys. The remainder of the plan follows the customary arrangement.

The Duke of Cambridge has promised to open the new permanent waterworks at Worthing in April or May.

The Devon Standing Joint Committee have accepted the tender of Messrs. Dart and Pollard, contractors, Paignton, for the erection of a new Police Station and Sessions Hall in Palace-avenue, at that place. The building, which is designed by Mr. E. H. Harbottle, Exeter, surveyor, will comprise a three-cell station, with married and single men's quarters, and large sessions hall. It will be built of brick, with Bath stone dressings, red tile roof, and will cost about £3,600.

The new sanatorium, Canterbury, now being erected from the plans and under the superintendence of Mr. A. H. Campbell, A.M.I.C.E., the borough engineer and city surveyor, is nearing completion. The contractors for the work are Messrs. G. H. Denne and Son, of Deal. The warming and ventilating is by means of Shorland's patent double-fronted Manchester stoves with descending smoke-flues, patent Manchester grates, ornamental exhaust roof-ventilators, and special inlet panels, the whole being supplied by Messrs. E. H. Shorland and Brother, of Manchester.



## LEGAL INTELLIGENCE.

**THE POSTAGE OF RETURNED NEWSPAPERS.**—At Bow-street, on Thursday, before Mr. Vaughan, the Strand Newspaper Company (Limited), 332, Strand, W.C., were summoned for the payment of 4d., due to the postal authorities for the return of nine newspaper packets to the senders. Mr. Edwin Winter supported the summons on behalf of the Postmaster-General; Mr. E. J. Kibblewhite, director of the defendant company, conducted his case in person. Mr. Winter said that these proceedings were taken under section 43 of the Post Office Act, 1 Vic. cap. 36, which provided for the recovery of the costs of postage not exceeding £20 in any court of summary jurisdiction. The claim now made was for the return of the postage of 4d. on nine newspapers, copies of the *Weekly Times* and *Echo*, posted by the defendant company to various persons in London and the country, which were undeliverable, and, in accordance with the request printed on the wrapper, were returned to the company. This demand was made in accordance with a Treasury warrant dated November 13, 1894, issued under the authority granted by the Post Office Act, 1875. By that Act the Treasury was authorised to fix the rates of postage and the circumstances under which charges were to be levied. This warrant, after giving the public, in an earlier clause, the right to the free redirection of any postal packet except a parcel, provided that with regard to any postal packet with a postage not exceeding 4d., when a request for the return of such packet to the sender appeared on the outside, the packet should be charged with a new, distinct rate of postage equal to that originally charged. Until their attention was called to it, the defendant company did not endorse their wrappers with a request for the return of undelivered packets, but such a request now appeared on their wrappers, and counsel submitted that this request was a consent to the charge. Mr. Vaughan asked if the charge was contested? Mr. Kibblewhite replied that the defence contended that the Act of Parliament referred to did not authorise the Treasury to issue any such warrant for a charge on undelivered papers, and that the Post Office had no legal or moral right to make such a charge. Mr. Winter called Mr. James Swainson, principal clerk in the secretary's office of the G.P.O., who produced the nine newspaper packets in question, the copy of a letter sent from his office to the defendant company, and Mr. Kibblewhite's reply, which was as follows:—"We refuse to pay the 4d. We are of opinion, in common with other newspaper publishers, that you have no right to make such a charge, and that it is ridiculously unfair that newspapers should be so surcharged or confiscated, while other communications which cannot be delivered are returned free. 'The interests of the taxpayers of the country' are in no way served by such exceptional unfairness. The Department does little enough for newspapers, who bring it most of its business, and the Postmaster-General would be much better employed in extending to us the facilities which are granted in other civilised countries, than in devising useless and vexatious restrictions from time to time. Many of these during the past 34 years I have had to compel the department to abandon. I shall have to take similar action again; but it is thankless work." Other formal evidence having been given, Mr. Kibblewhite maintained that the Act referred to only authorised the issue of a warrant dealing with the matters mentioned in the Act—viz., outgoing postage. There was not one word in the Act as to any charge to be made for the return of undelivered postal packets. Mr. Winter said that there was no obligation on the part of the Postmaster-General to return undelivered letters at all. Mr. Kibblewhite submitted that custom conferred such an obligation upon him. Mr. Vaughan said that he would consider the point, and he adjourned the case for a week for that purpose.

**T. DREW-BEAR, TOLPUTT, AND BROWN v. THE ST. PANCRA GUARDIANS AND A. AND C. HARSTON.**—The hearing of this protracted case, the previous stages of which we reported in our issues of July 17 and 24 and November 20 and 27, 1896 (pp. 98, 133, 755, and 769 last volume), Jan. 22 and 29 last, pp. 149 and 185, and in our last issue p. 365, was concluded on Saturday last at the Old Bankruptcy Court, Portugal-street, W.C., before Mr. Edward Ridley, Q.C., sitting as the Official Referee; but, as will be seen, judgment has been reserved. On Friday, Mr. English Harrison, on behalf of the St. Pancras Guardians, urged that the plaintiffs had made out no case against his clients for anything done by Messrs. Harston with regard to the condemnation of materials as not being in accordance with the specification. Poole was solely the inspector and assistant of the architects, and, therefore, anything that he did could not give the plaintiffs a cause of action against the guardians. The evidence made it, he argued, clear that the decisions of Messrs. Harston had always, from first to last, been acquiesced in by the contractor. Mr. Boden, who was the chairman of the building committee, had in his evidence said

that when a complaint was made to him on the matter, he told Fearon that he should write a letter to the clerk of the board, and then it would be dealt with. Fearon, however, had never taken that course, and from first to last had brought no complaint—excluding the matter of the handrail—before the board or the committee, and, therefore, had always acquiesced in the decisions of Mr. Harston. From time to time, when Poole had expressed his non-approval of the work, one of two things had happened. In some cases, Fearon had gone on using the material, or left the work in without taking any further trouble at all. On the other hand, there were instances where Poole had served a written notice on the contractor in the terms of the provisions of the contract, that he would not allow certain materials to be used. In some cases Mr. Harston did not agree with Mr. Poole, and overruled him, and in other cases he agreed with him, and decided against Fearon. As all those matters had been dealt with and settled under the contract, it was not within the province of the Official Referee to enter into them at all. It was important to remember that there was no guarantee in the contract anywhere on behalf of the employers that Messrs. Harston would properly superintend the work at all, although the work was to be done to their satisfaction. The plaintiffs asked that the contract should be set aside altogether, and that a totally different set of obligations should be substituted for those obligations which had been signed, sealed, and delivered by them in their contract. There could be no doubt that all the parties had acted upon the supposition that the contract was absolutely binding upon them, and that the terms were to be fulfilled by all of them. At the time there were disputes about certain materials, and when Mr. Harston was enforcing certain rights under the contract, Fearon never went to the guardians and suggested that he was not being properly treated, and therefore the guardians had not the slightest idea that anything improper was going on. It was not fair to the guardians to keep them in the dark, and try to make them liable afterwards. It was a most monstrous thing for the plaintiffs to assert that they were not bound by the terms of the contract, having regard to the fact that they persuaded the guardians to go on with it, and got the guardians to advance them more money under the contract than they were entitled to obtain. It was said that the conduct of Poole and the conduct of Messrs. Harston was the cause of the contract being set aside, and a reason why the guardians should have obligations put upon them which they never understood. If the builder acquiesced in what Poole said, he could not afterwards turn round on the employer and complain that Poole told him to do a thing which he had no right to do, and that he (the builder) went and did it. It seemed a startling proposition to say a document which was under seal could be got rid of in that way. The Official Referee: If the contract is made impossible of performance, there is an end of it. If you make a contract with me and then put it out of my power to perform it, that is an end of the contract. You cannot complain of my not performing the contract if you put it out of my power to do so. Mr. English Harrison, continuing, contended that inasmuch as the parties had acquiesced in, and acted on, the contract from first to last, they were bound by the terms of it, and that the proper course for the Official Referee to take would be to ascertain what damages (if any) plaintiffs would be entitled to for breach of the contract, and what those breaches (if any) were. Mr. Bray, replying on the whole case, said that the question of acquiescence did not enter into the case at all, and that in the special circumstances the contract has ceased to exist. The learned counsel, having dealt in detail with the figures and the claim, said that it was suggested the plaintiffs had employed an incompetent foreman; but he contended that if ever there was a competent man for the work that man was Mr. Fearon. He impressed upon the Official Referee the fact that the work in question cost over £20,000 more than was anticipated, and therefore the assumption was, he said, that the circumstances were altered. He asked the Official Referee to find on the evidence that the contractor was prevented from taking possession of the site, and that it was not the contractor who neglected to do so. Dealing with the conduct of Mr. Poole, the clerk of the works, the learned counsel asked the Official Referee to find that Poole had condemned materials which he knew perfectly well were sufficient. This he probably did in some cases to get better materials than he was entitled to, and in others might be attributed purely to temper. The Official Referee: I think he did; anybody who recollected him in the witness-box I do not think could deny that. What they say on the other side is that they ought to have treated this man who lost his temper with contempt, or gone to the architects. I should like to know how you deal with that point. Although Fearon says that Mr. Harston informed him that he should always support the clerk of the works, that was not until June, 1893. Why did not Fearon go to Mr.

Harston? Mr. Bray replied that his answer to that was that it was not a practical remedy, inasmuch as it would take three or four days to get the attendance of the architects, the work being suspended in the meantime, and therefore it was better and saved expense for the contractor to give way to Poole than to go to the architect. It did not rest there, however, as Poole, like all other clerks of the works, had the ear of the architect, and it was, therefore, no use for the contractor to struggle against him. Although the charge of fraud or dishonesty of the architects had gone, he did not abate one atom from the suggestion that he had made throughout that the architects had been unreasonable, and grossly unreasonable. The architects, in delegating their functions in the main to Poole, had not exercised their discretion in the matters in question, but had left them to be entirely governed by Poole. Mr. Bray concluded his address by asking the Official Referee to find that the plaintiffs had proved their case up to the hilt, and were entitled to a *quantum meruit*. The Official Referee intimated that he should take a few days to consider his judgment. Judgment was reserved accordingly.

**ALLEGED INFRINGEMENT OF PAVEMENT BLOCK PATENT.**—The appeal of the defendants in the case of the Adamant Stone and Paving Company, Limited, v. the Corporation of Liverpool, from an order made by Mr. Justice Romer on the 30th of November last, restraining an alleged infringement of a patent owned by the plaintiff company for making paving blocks by compression, was on Tuesday withdrawn in the Court of Appeal, the parties having come to terms, which were, however, not stated.

**ARCHITECTS' CLAIM AGAINST A BUILDER.**—THE ROYAL GOLF LINKS HOTEL, CROMER.—On Wednesday and Thursday, in the Official Referee's Court branch of the Chancery Division of the High Court of Justice, Mr. Verey, Q.C., had before him the case of Homer and Ridler v. Lavington. Plaintiffs were Messrs. Homer and Ridler, architects, 35, Bucklersbury, London, and the defendant was Mr. Chas. David Lavington, builder and contractor, 334, Green-lanes, Finsbury Park. Plaintiffs claimed services rendered in connection with the erection of the Golf Links Hotel, Cromer, Norfolk, 5 per cent. commission upon £30,000—viz., £1,500, and travelling expenses, £30, total £1,530; less cash received on account from time to time, £417 5s.; balance, £1,112 5s. The defence was that there was no agreement as to 5 per cent. commission on cost; but that at a certain stage 2½ per cent. commission on advances was arranged, under which defendant's liability had been fully satisfied by the payments made to plaintiffs; and there was also a counterclaim for £225—£75 for drawings which it was alleged that plaintiffs ought to have furnished, but failed to do so, and £150 for specifications got out by Messrs. Norman and Long. Mr. Houghton appeared for the plaintiffs, and Mr. T. M. Stevens for the defendant. Counsel for plaintiffs occupied two and three-quarter hours on Wednesday in opening his case, a considerable portion of this time being occupied in reading a voluminous correspondence extending from December, 1893, down to the period when litigation commenced in 1896. The action, Mr. Houghton stated, was brought by plaintiffs for the recovery of the balance of their professional charges for work done by them in connection with the erection of the now well-known Royal Golf Links Hotel at Cromer, and it arose in this way: Messrs. Homer and Ridler saw an advertisement in reference to the hotel, which had been inserted by Messrs. Humbert, Son, and Flint, land surveyors, who acted as land agents for Lord Suffield, the principal landowner at Cromer. It appeared that Lord Suffield had entered into a building agreement with a Mr. J. T. Chappell, a builder at Pimlico, in a large way of business, but who ultimately failed. Chappell had to build an hotel on this particular site, which was considered a good one, being higher than the Grand Hotel at Cromer, close to the station and to the golf links, and in the present popularity of the game of golf it was felt that a large number of people would go there and prefer to be in the beautiful air of the higher situation and close to the links. There was no reason to doubt that now the hotel had been opened the expectations of everybody in connection with it had been fully realised. Mr. Chappell had expended money in getting plans prepared; he had made excavations, and he had got a provisional license, and the Official Referee would find that the work so done, together with the license, had been admitted by defendant himself to be of the value of £7,000. Plaintiffs, in consequence of the advertisement, got into communication with Messrs. Humbert, Son, and Flint, and correspondence took place between them—negotiations, in fact—with the view of seeing the best terms upon which Lord Suffield would be willing to allow someone to step into the shoes of Mr. Chappell and complete the building, plaintiffs' intention being, when they had got the best terms they could and the fullest information, that they would introduce it to someone who would take it up as a speculation, and who would, in consideration of



that, having introduced good and available business, employ them as architects for the superintendence of the work, and they stipulated to Messrs. Humbert, Son, and Flint that they should assume that capacity in the event of their finding anyone to carry out the job. Then Mr. E. C. Romer, of plaintiffs' firm, put himself into communication with Mr. A. H. Roberts, an accountant in business in the City and at Cardiff, as being a person likely to be able to arrange with some builder to join him in the speculation, and carry the matter out, and it appeared that soon afterwards, through plaintiffs, Mr. Roberts entered into communication with the defendant. The result of these negotiations was that certain proposals were made by plaintiffs, acting on behalf of Mr. Roberts, as intending lessee, to the effect, generally, that the freehold should be open to be acquired for £4,000 within a specified period, that the building material then on the site should become the property of the lessee, that plaintiffs should be the architects, and should utilise the plans already prepared. A good deal of work was done afterwards, for which detailed drawings were supplied by plaintiffs; but counsel did not suggest that there was any essential difference in comparison with the original plans. Plaintiffs' position was that the 5 per cent. commission on the whole cost was really the consideration they were to receive for introducing what was regarded as a very good piece of business to Mr. Roberts and the defendant. These terms were embodied in an agreement dated 11th May, 1894, between Roberts and defendant, and when a building lease was entered into on June 23, it was granted by the Overstrand Estate, Ltd., Lord Suffield concurring in the lease. In addition to that there was a deed of covenant, providing for the option to purchase the freehold at £4,000 within a certain time, and a deed of mortgage to secure £400 already advanced, and further advances which might be made under the arrangement. It was clear that when these documents were entered into formally with Roberts, the latter was really only the trustee for himself and defendant, that it was as much Lavington's speculation as Roberts', and that both were interested from May 12 for good or for evil, whatever might happen. From that date, however, Roberts took no active part in instructing Mr. Homer, whose subsequent transactions were all with the defendant. On May 16th, plaintiffs reminded defendant in writing that their commission would be 5 per cent. on cost, but that he would have to pay £3 3s. per week salary to their assistant as clerk of works. But in June defendant began to raise objections, and made continual attempts to vary the original arrangement, with such success that, in August, 1894, upon Mr. Lavington's representations, he had got into things which would probably ruin him, and therefore he should not be expected to find money, and so on. Plaintiff agreed to take 2½ per cent. upon the amount of advances until the defendant sold the property, or formed a syndicate to work it, when they were to have the remainder of their 5 per cent. Defendant also made several objections to paying the salary of the clerk of the works; but when this was mentioned to Mr. Flint, that gentleman insisted upon the retention of the clerk of works. It was not in dispute that defendant had paid the salary of the clerk of works from the beginning. In July, 1894, a receiving order was made against Mr. Roberts, and right through the rest of that year defendant went on doing the work, taking advances and all the benefit of Roberts's agreement with Lord Suffield; and, in fact, not until months afterwards was there any agreement between his lordship and Mr. Lavington. Although defendant had been telling plaintiffs that he had them at his mercy, yet he wrote, at their request, on Aug. 23, 1894, that, to settle the matter of fees, he would be willing to pay 2½ per cent. on the amount of the advances and the clerk of works' fees. This was a cool proposal; but feeling they would like to have something binding, plaintiffs got the letter stamped, and counsel could not help thinking that it was this piece of crass stupidity which had caused the action. Mr. Stevens: We did not know it had been stamped until the inspection of documents. Mr. Houghton said that if people were not so chary about their six-and-eightpences, they would not get into these mistakes. Plaintiffs, however, complained in writing about defendant wishing to cut them down to one-third—that being what it amounted to, considering that through their introduction he had got a splendid speculation, work, plant, and licenses worth thousands of pounds. Defendant saw Mr. Homer, and said they must be content with 2½ per cent. in advance until he sold the property. Seven days later (Aug. 31) he wrote denying that he had ever employed them, adding that they might get an interest in the property, but that would be a matter of arrangement. It was not until January 15, 1895, that defendant acquired a legal interest for himself alone in the undertaking, he on that date having entered into an agreement with Mr. Clark, the trustee in the bankruptcy of Roberts, giving him power to purchase the fee simple for £4,000 at any time within five years. It appeared

from the document that the defendant purchased all the interest of the bankrupt for £550. In July, 1895, defendant formed a syndicate company for carrying on the hotel, and subsequently, when pressed for the balance plaintiffs said was due to them, Mr. Lavington denied that he had been advanced more than £16,000, adding, "the difference between advances and sale is quite another matter." Plaintiffs suggested arbitration, but this was not consented to, and hence the action. Mr. Edwin Chas. Homer, of the plaintiff firm, said that when they thought of entering into negotiations concerning the Golf Links Hotel property, defendant was erecting some houses at Stamford Hill, for which they were the architects, and Mr. Roberts was financing a builder of others at Staines. In August, 1894, they would have been willing to accept 3½ per cent., instead of the usual 5 per cent., because defendant had led them to believe they were entirely out of a job. Had Mr. Lavington written accepting that offer, it would have been agreed to, but he said they must be satisfied with 2½ per cent., he paying the clerk of works' fees and travelling expenses; but provided the work turned out all right, and he formed a company, he would make up their full commission. That defendant told them dozens of times; and he told Mr. Ridler that he would give a bonus besides if it turned out all right. They never consented to the 2½ per cent. on advances, although they acted upon it, and after the first receipt always acknowledged payments as "on account." Apparently, the advances on their certificates came up to £15,700 odd; and they had received on account £420 5s. If the total advances were £20,000, they had not received anything like 2½ per cent. Work amounting to £1,850 had been done after the company took over in July, 1895, according to plaintiffs' report and designs, and for that they had not been paid. Witness repudiated the items in the counter-claim. Mr. Homer's examination was concluded yesterday (Thursday). Cross-examined, he admitted that defendant came in first to supply the brickwork, but repudiated the idea that Lavington's introduction to Roberts was simply that he should carry out the work as a contractor. Defendant was to be a co-venturer with Roberts, and the agreement between them showed so. In witness's opinion defendant built the hotel for very much less than he got for the work, because everything turned out right for him. The Official Referee said the agreement with Roberts showed that Lavington agreed to build for the two-thirds advance. Were plaintiffs going to argue that they were entitled to 5 per cent. on something beyond that? Mr. Houghton said the advances were to be two-thirds of the value, taking Laxton's book of prices. Witness explained that the building was to cost one-third more than defendant was advanced. Anyone financing a builder would only advance him two-thirds of the estimated cost which in this case was £30,000 on Laxton's prices. Evidence was next heard for the defence. Mr. W. B. Flint, of Messrs. Humbert, Son, and Flint, said that in August, 1894, Mr. Homer called upon him and said he had been discussing the question of what remuneration he should have as architect of this Cromer work, and defendant had suggested that plaintiff should come and see witness, and be guided by him. He told Mr. Homer that, the plans having been already prepared, 2½ per cent. was a fair and reasonable remuneration. Mr. G. L. Wheateley, Messrs. Rooper and Wheateley, solicitors, Lincoln's Inn-fields, described the negotiations which resulted in Mr. Roberts acquiring an interest in the Cromer hotel property, and said Roberts, on June 29, 1894, gave an authority for all payments under the mortgage to be paid to Lavington. After Roberts got into difficulties, defendant came and produced his agreement with Roberts as proof that he had an equitable interest. Eventually witness consented to let Lavington go on, taking from him a special form of receipt under which he personally indemnified them for the advances. On the original directions for Roberts as to payments to defendant, dated June 24, 1894, there was a footnote authorising witness to deduct 7½ per cent. for architects' and surveyors' fees. Witness volunteered to use his influence to secure a reduction to 5 per cent., and he understood both plaintiffs and Messrs. Flint assented to that. The total advances made to defendant were £16,000. On July 8, 1895, defendant entered into an agreement to buy the freehold for £5,200, and sold it on July 10—sold it to the Links Hotel, Ltd., for £39,000, of which £23,500 was in cash, and £15,500 in £10 shares. The case is still proceeding.

**WOOD-PAVING DISPUTE.**—In the Queen's Bench Division, on the 5th inst., before Mr. Justice Wills, the case of the Wood Block Flooring Company, of Queen Victoria-street and Caledonian-road, against Messrs. Paramor and Sons, builders, of Margate, came on for hearing. Mr. H. J. Dickens, Q.C., for plaintiffs, said the claim was for goods sold and work done at the South-Eastern College, Ramsgate. The total claim was for £312 2s. 9d., on which £200 cash had been paid, and the amount now sued for was the balance, £119 3s. The defendants had in the first place denied the whole claim, and then they said the wood blocks were not of proper material,

and that the work was not done in a workmanlike manner; also that the material and work came to £40 less than the amount charged. They paid into court £20, and asked that the other £80 paid into court should be appropriated. That made £100, and if the matter had rested there his clients would not have come into court; but defendants counter-claimed for £40 damages, so that they were obliged to take these proceedings. In all there had been laid down between 40,000 and 50,000 blocks for flooring, and there were only about 650 complained of. His lordship said in his opinion the defects in the floor had been enormously exaggerated. He thought that a £5 note would cover all that was necessary, and gave judgment for the defendant on the counter-claim, with no costs, and for plaintiff for £16 2s. 9d., beyond the amount paid into court.

**THE LONDON COUNTY COUNCIL AND THE TRAMWAYS.**—An arbitration to fix the value of the tramway depot, stabling, granaries, and other premises of the North Metropolitan Tramways Company, to be acquired by the London County Council, was opened on Monday before Mr. James Green, the arbitrator, at the Surveyors' Institution. The witnesses for the company were Sir J. Whittaker Ellis, who estimated the value of the property at £311,397, Mr. Daniel Watney, President of the Surveyors' Institute, and Mr. E. H. Bousfield, of Messrs. Edwin Fox and Bousfield, who agreed generally with Sir J. Ellis's figures. For the County Council, Mr. Arthur Young valued the property at £127,007, the other witnesses called by them on Tuesday and Wednesday being Mr. Alfred Moore, F.S.I., senior partner in the firm of C. C. and T. Moore, Mr. W. H. Collier, F.S.I., Messrs. C. W. Brooks and A. J. Boulton, quantity surveyors, and Mr. E. T. Atkinson, mechanical engineer. Counsel then addressed the arbitrator, who announced that he should take time to consider his award.

#### CHIPS.

The harbour works at Hastings are making progress, and the main western breakwater, which is now carried 1,200ft. seawards, will be completed by August next. Mr. A. E. Carey is the engineer-in-chief, and Messrs. Punchard, McTaggart, Louth, and Co. are the contractors.

The Hon. Mrs. Portsman, of Hestercombe, laid on Thursday in last week the corner stone of a new church which is to be erected at Bathpool, in the parish of West Monkton, at the junction of the Taunton canal with the Bridgwater main road. The style will be Early English, and the building, which will accommodate 150, will be of Monkton stone, with dressings of Bath stone.

The estimated cost of the new offices for the West Riding County Council at Wakefield, including furniture and fittings, is £103,543. The work is so far advanced as to permit of the general opening of the buildings in November next.

The sawmills and timber-yard, Britannia Wharf, Limehouse, belonging to Mr. J. East, timber merchant, were badly damaged by fire on Sunday morning.

An inquest was held on Wednesday in Hampstead on the body of a man named Harry White, aged 35, described as "an electrical joiner." He was cleaning the transforming chamber of a substation of the electric lighting department in Lyndhurst-gardens on Saturday, when an electric current passed through him and killed him instantly. The chamber had been built, Mr. Cottam stated, in conformity with the regulations of the Board of Trade, and the accident was described by Major Carthew and other experts as inexplicable and unique. The jury returned a verdict of accidental death.

The annual soirée and concert in connection with the East of Scotland district of the United Operative Plumbers' Association of Scotland was held on Friday night in the Literary Institute, Edinburgh, Mr. John Barton presiding. There was a large attendance. The chairman said that for the past year they had paid in sick-allowances £144, and after paying all expenses there was a balance of over £200 left. A musical programme was gone through in the course of the evening.

During the excavations for the Central London Railway, in front of the Royal Exchange, several interesting objects have been found, which have been deposited in the Guildhall Museum. The only object dating back to Roman days is a small vase, of glazed red Samian ware, with the maker's name, in an abbreviated form, stamped in the bottom of the vessel SA. AP. F[ecit]. This was found with the necks and handles of some large amphorae, a fragment of a mortarium, and fragments of other coarse ware. The principal discoveries of later times were a goblet of Venetian glass, with a moulded stem, which dates probably from the 16th century, and a little money-box of glazed buff ware, a Delft plaque, and a Bellarmine or round ale jug, and a two-handled tyg of brown Staffordshire ware.



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## Our Illustrations.

ST. ANSELM'S CHURCH AND VICARAGE, MAYFAIR.

We give illustrations this week of St. Anselm's Church and vicarage, in Davies-street, Berkeley-square. The buildings are erected on ground given by His Grace the Duke of Westminster, and occupy the eastern portion of a site which is bounded on the north by Robert-street, east by Davies-street, south by Cock-yard, and West by Gilbert-street, the schools belonging to the church being built on the western portion of the site. Owing to houses having occupied the site, it was necessary to take the foundations of the new buildings down to the level of the old foundations, and consequently there is a crypt under the whole of the church, which is used for choir and clergy vestries, lavatories, and storage, as well as to accommodate the heating apparatus. The walling of the church and vicarage is built of stock bricks and faced with the same, the dressings being in Portland stone, and the angle quoins of red bricks. The roofs are covered with hand-made red tiles, and the main roof is provided with cast-lead downspouts, discharging into into copper gutters which convey water over the tiles of the aisle roofs, to the gutters of same, which are formed with asphalt. The water from these gutters is taken down in large stoneware pipes built in the buttresses, large stone gargoyles being provided in case of blockage. Robert-street is some feet above the level of Cock-yard, and this difference of levels is met by a flight of steps protected by a porch. The vicarage has sash windows with wooden glazing bars, and the church windows have lead glazing in which Prior's Early English glass is used throughout, the saddle-bars being of gun-metal. Within the church blue Robin Hood stone is used for the dressings, and the wall surfaces are smooth plastered and whitewashed, with the exception of the dado, which is of Powell's glass tiles fixed flush with the plastering, and runs all round the church. The chancel floor is paved with green and black marble in alternate squares, and the choir-stalls are of teak, the ends being 4in. thick. The altar-rail is entirely of brass, and the chancel screen wall is of Irish green marble, with a break forward on the north side to form a pulpit, and a low gunmetal railing surmounts the wall. There is a side chapel having an ebony altar-rail, within which the floor is paved with alternate blocks of dark and light-coloured hard woods. Messrs. Balfour and Turner were the architects, and Messrs. Walter Holt and Sons, of Croydon, the builders. The church was erected to take the place of the Hanover Chapel in Regent-street, which has lately been demolished. A plan of the building appeared in the BUILDING NEWS for Feb. 21, 1896, with a description.

## A PROVINCIAL MARKET HALL.

In the particulars given by the Council of the Royal Institute of British Architects for this competition, a design for a provincial market hall, having an area of 4,000sq.ft. was required, to be detached on all sides and to stand in the centre of a market place, the area given did not allow of much scope in planning, and the whole of the ground floor is practically taken up by market standing with a small corn exchange, while the upper floor has an assembly-room with raised platform at end, and it was proposed to have a mezzanine floor between the space for fire-engine and platform, to form a committee-room connected either with the corn exchange or the above-mentioned platform; with regard to the treatment externally, the endeavour has been to make the building look suited to its purpose. A medal of merit was awarded to Mr. J. A. Swan, the author of this design, of which we give view, plans, and details.

## RESIDENCE AT PULHAM MARKET.

This house was built in a small country town to suit the special requirements of the owner, Dr. Legge Paulley. There are stables, coachhouses, outbuildings, and a coachman's cottage at the rear. The principal entrance is at the side against the projecting chimney stack, the arched entrance in front serving as garden entrance through a kind of inner hall, now used as a schoolroom. The view shows the south front, from whence very good country-side views are obtained. The house is built of red brick, relieved by tile hanging and timber and rough-cast. Messrs. Brock and Son, of Aldeburgh, were the contractors, and Messrs. George J. and F. W. Skipper, of Norwich, were the architects.

## NEW PUBLIC BATHS, KINGSTON-ON-THAMES.

THE Corporation of Kingston-on-Thames are now building the public baths, which are illustrated herewith to-day. The design was selected in a competition held last year among some five or six invited architects, when the plans submitted by Messrs. Francis J. Smith and Maurice B. Adams were chosen. Mr. A. Hessel Tiltman acted as professional referee, advising the town council in making a choice. The plan given with the accompanying view shows the arrangement of the ground floor finally determined on. The women's baths, in the upper part of the front building in Wood-street, are not reached at present. Mr. W. Cunliffe, of Kingston, is the builder. The engineering work is being executed by Messrs. Z. D. Berry and Sons, of Westminster, and the clerk of the works is Mr. C. Parker. Red brick facings and stone dressings give colour to the façade. The hall entrances are distinct from those used for the bath, and separate gallery exits are also contrived. Economy of administration has governed the planning, and restricted outlay has been rigidly observed. The swimming pond measures 80ft. by 30ft., and the public bath is so arranged as to be adaptable during the winter months for purposes of public entertainment and in the summer for swimming galas. Club rooms and an establishment laundry are provided at the rear of the buildings, where there is a separate approach. The opening of the entire undertaking in connection with the Diamond Jubilee commemoration is contemplated by those who take an active part in the advancement of the borough of Kingston.

## FIREPLACE: METROPOLITAN CLUB, NEW YORK.

THIS refined example of interior decoration, included in this week's illustrations, forms a feature in the main card-room of the Metropolitan Club, New York. Messrs. McKim, Mead, and White are the architects, and the good taste which characterises their work is exemplified in the subject of our sketch, taken from a plate in the *American Architect*.

## COTTAGES: PORT SUNLIGHT, BIRKENHEAD.

THE design illustrated shows a block of two cottages erected for Messrs. Lever Bros., Limited. The architect is Mr. T. Taliesin Rees, A.R.I.B.A., Birkenhead. The half-timber is English oak, the bricks are red Ruabon, and the roofs are covered with Parson Smith's tiles. The work was executed by Messrs. McLachlan and Batkin, contractors, Birkenhead, at a cost of £930.

Princess Christian will lay the foundation-stone of the new cancer wing of Middlesex Hospital on July 1.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—On Tuesday last a lecture was given by Mr. C. J. Tait, A.R.I.B.A., to the members of this Society, on "The Parthenon." Some very fine lantern slides of the building, as well as the sculpture now in the British Museum, were shown. A lecture on "Architectural Photography" will be given at the Athenæum, Exeter, on Tuesday, 16th inst., by Mr. Charles Cole.

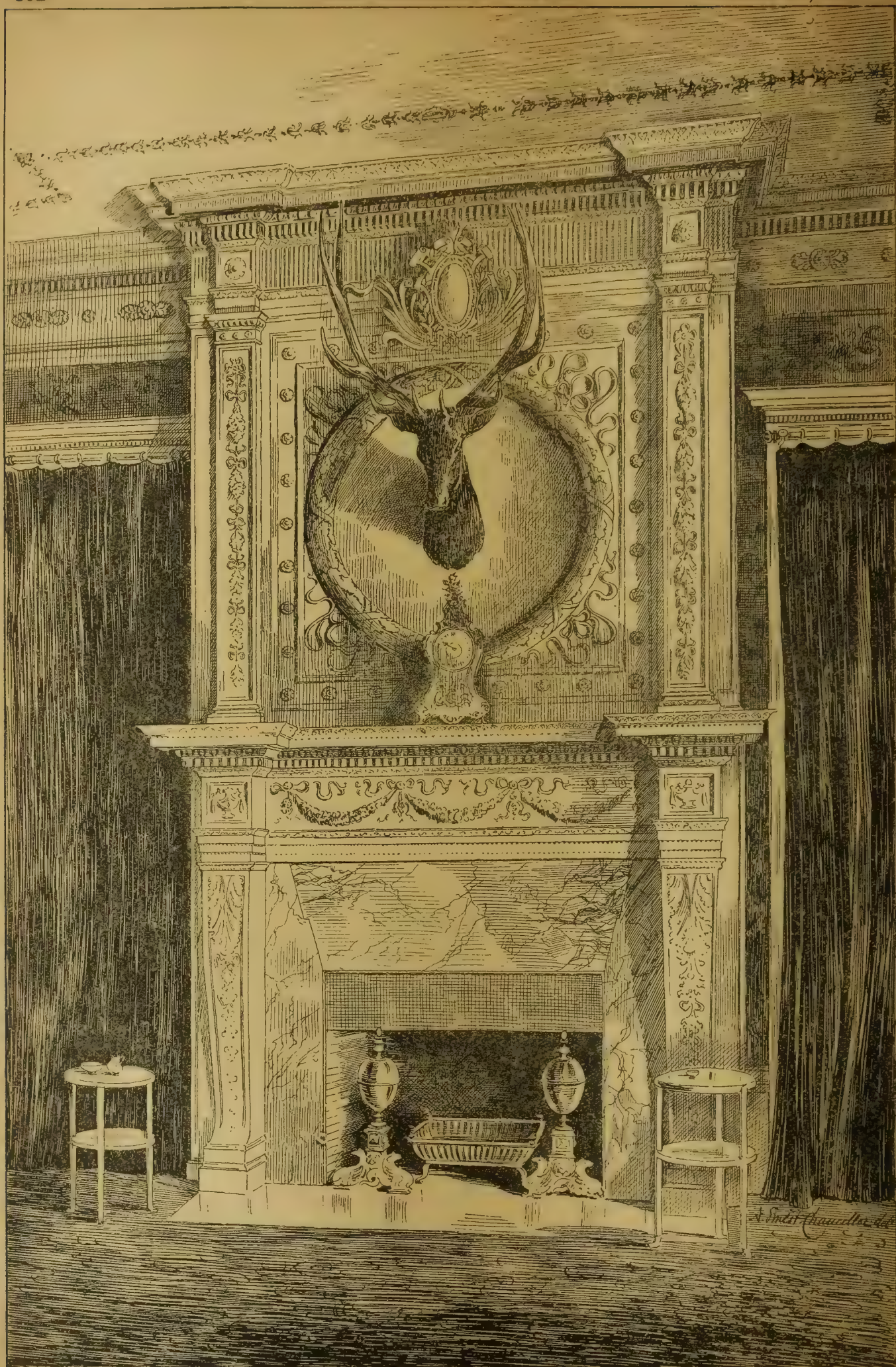
A SHEFFIELD ARCHITECT IN HOLLAND.—The monthly meeting of the Sheffield Society of Architects and Surveyors was held on Tuesday night at the School of Art, Arundel-street. The president, Mr. C. Hadfield, F.R.I.B.A., was in the chair, and among those present were Messrs. E. M. Gibbs, F.R.I.B.A., C. J. Innocent, F.R.I.B.A., F.S.I. (hon sec.), C. B. Flockton, A.R.I.B.A., T. H. Waterhouse, J.P., B. D. Wrangham, T. R. Ellin, T. Winder, A.M.I.C.E., C. F. Innocent, A.R.I.B.A., T. H. Firth, W. C. Fenton, A. H. Holland, C. F. Longden, and others. The main feature of the gathering was a lecture by Mr. J. B. Mitchell-Withers, A.R.I.B.A., on "A Tour in Holland," which proved highly entertaining and instructive. The lecturer divided his lecture into three parts; first, a description of the route which had been taken in the tour; secondly, a general description of the main features which occur in the towns, especially in reference to the domestic architecture, which is the principal feature of the country; thirdly, a few historical notes, and notes on public buildings and special objects in the different towns. The principal towns referred to were Rotterdam, Delft, The Hague, Scheveningen, Amsterdam, Dordrecht, Leyden, Haarlem, Hoorn, Alkmar, and Arnhem. The lecturer pointed out the advantages of Holland for a short trip, owing to the ease with which one can get there and the facilities for getting from one place to another. With reference to the domestic architecture, he drew special attention to the gables, with their picturesque outlines and graceful ornament, mentioning incidentally the old-fashioned beams and pulleys, with their quaint roofs projecting from the steep, old-fashioned gables. Referring to the internal decorations, he described the old Dutch tiles, with their quaint design, which were principally made at Delft, saying that before seeing the tiles he had not realised why so many tiles had a small dot in the centre only, and preferred those with larger pictures on them; but when a wall or fireplace is seen covered with tiles, those with the small centres being used as filling, and those more largely covered with painting being used for borders or divisions, the effect produced is far more pleasing than if more painting were introduced; and as in some cases a story is continued from tile to tile in the pictures, the white space round it serves the same purpose that a margin does for an engraving or print, the joint between the tiles helping to frame the picture and bind it to its fellows. He gave a short historical account of Holland, showing at what periods activity in architectural design had existed, and completed his lecture by showing a number of slides illustrating various interesting scenes in the country. Two auditors were appointed—Mr. Edmund Winder, jun., and Mr. J. B. Mitchell-Withers. The usual votes of thanks were passed at the close.

The work of repairing the west front of Crowland Abbey Church having been completed, the building, which occupies a portion of the monastic church, is being enlarged. The east wall has been taken down, and will be re-erected 12ft. eastward, so as to increase the space in the quasi-chancel, and provide a buttress to an insecure Norman arch forming part of the ruins at the rear. Mr. John Thompson, of Peterborough, has the work in hand.

The city council of Sheffield appointed, on Wednesday, Mr. William Watts, of Oldham, as resident engineer for Little Don Valley Works, at a salary of £800 per annum, and rising by £100 a year to a fixed salary of £1,000 per year.

The Everton Football Club, at a meeting held at Liverpool on Friday night, decided, after some discussion, to replace the existing grand stand by a larger structure, circular in plan, at an estimated cost of £3,000. The stand at present in use is 385ft. long, 25ft. wide, and 17ft 6in. high to the eaves, and will accommodate about 3,000 persons; whilst the proposed new erection will hold fully 6,000 people, its length being 450ft., width 57ft., and height 30ft.





FIREPLACE IN CARD ROOM · METROPOLITAN CLUB · NEW YORK · MESS<sup>rs</sup> McKIM MEAD & WHITE · ARCH<sup>ts</sup>







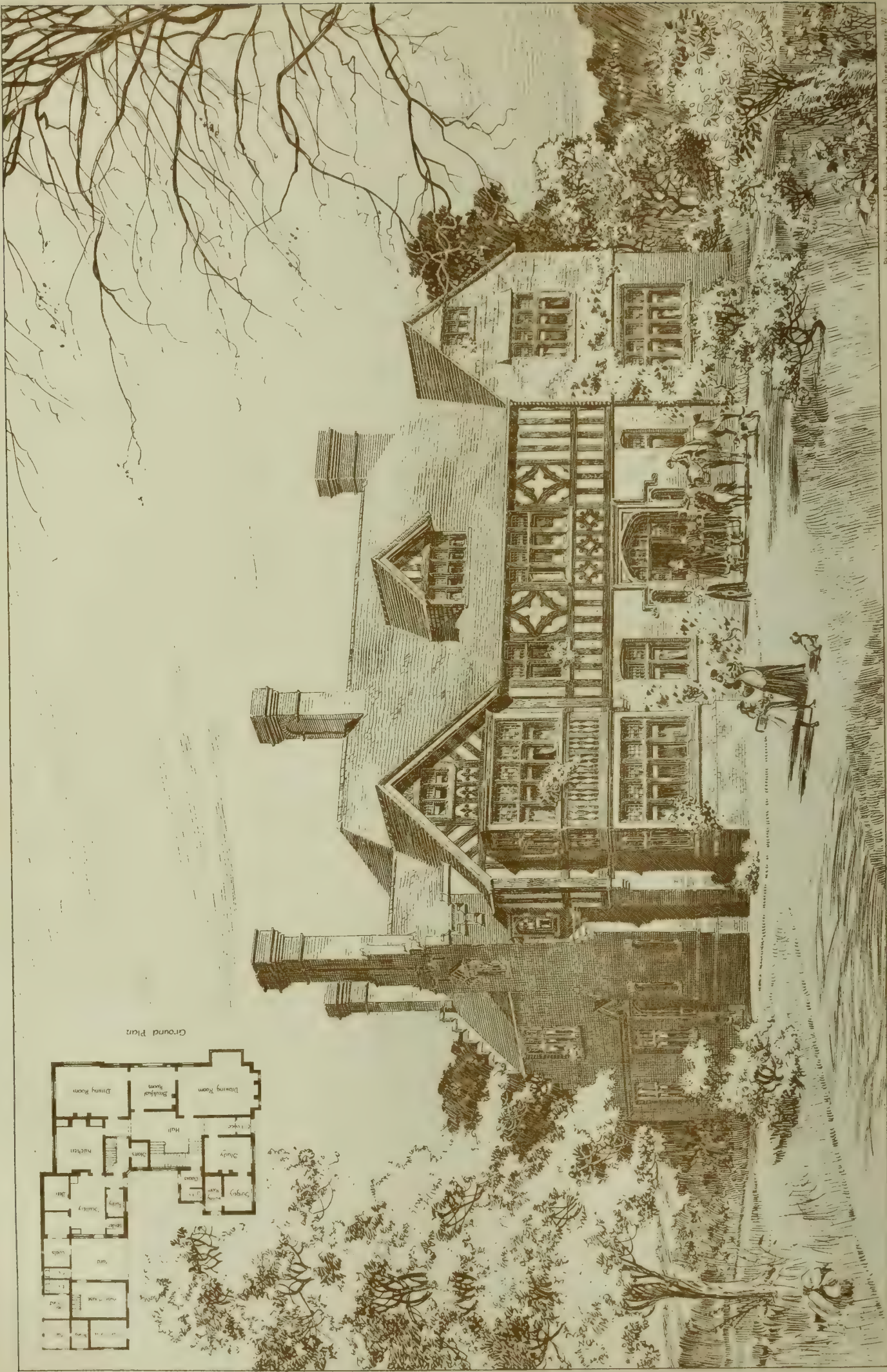


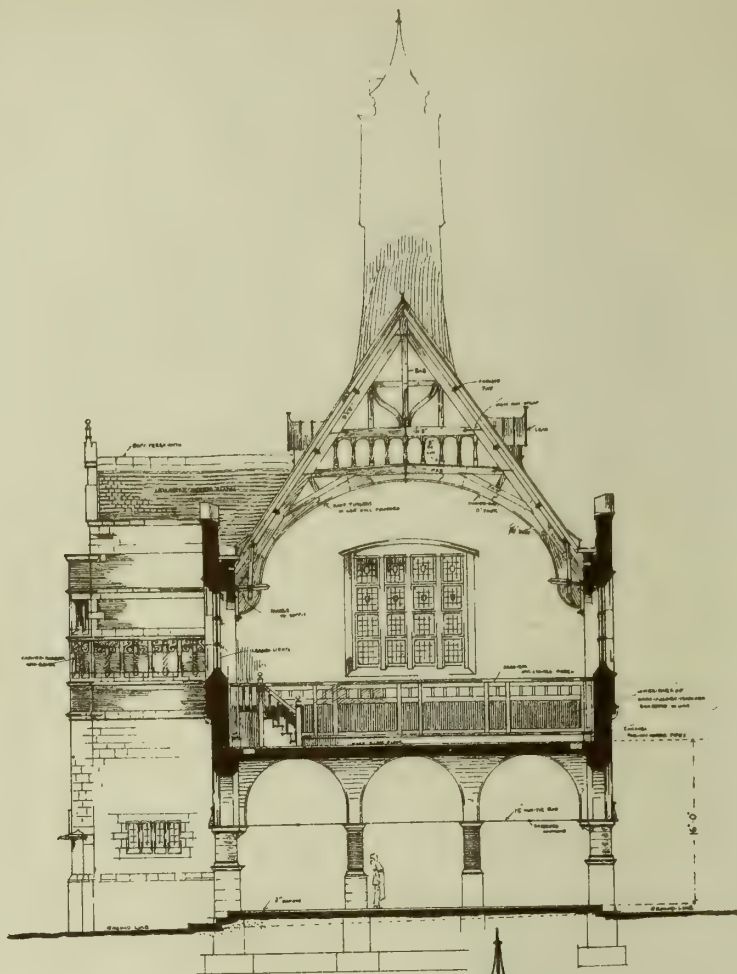
Photo. (all prepared & printed by James Alderman & Co., Queen's Square, W. 2)

HOUSE AT PULHAM-MARKET, NORFOLK. MESSRS. GEO. J. & F. W. SKIPPER ARCHTS.

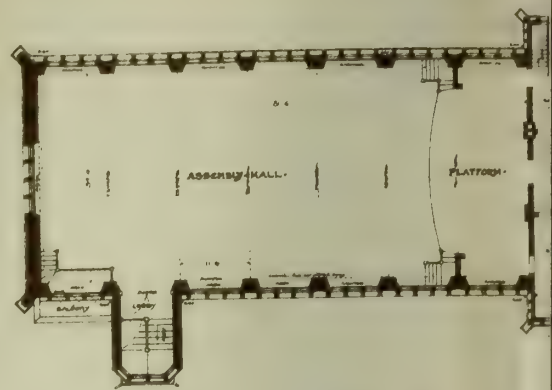




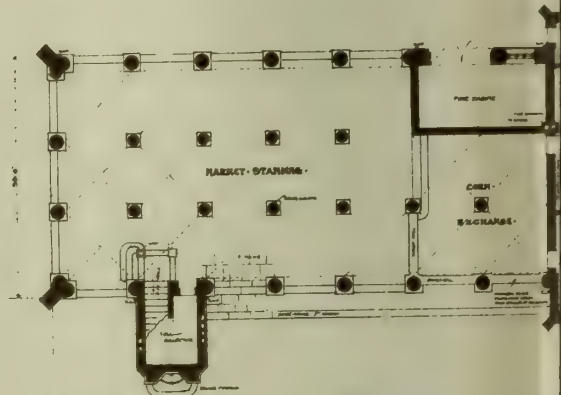




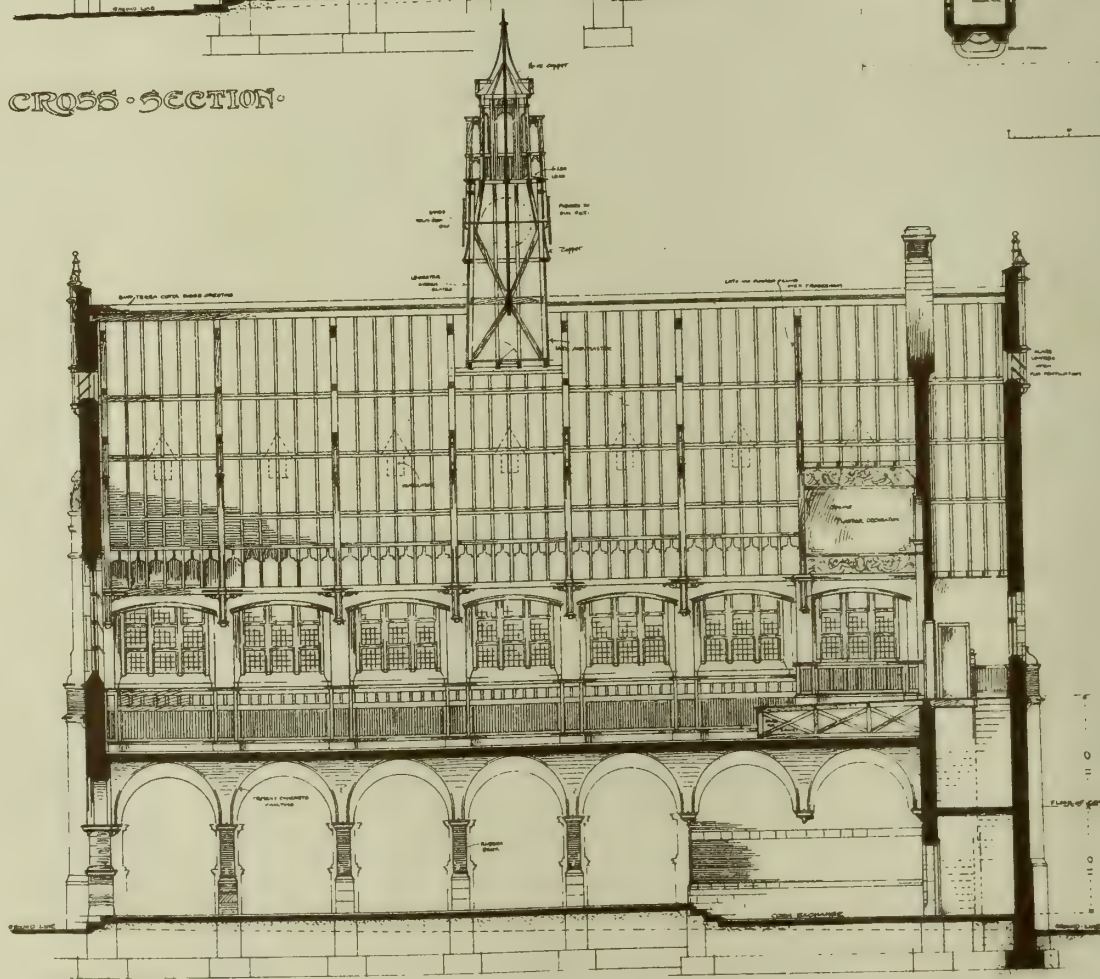
CROSS SECTION.



FIRST FLOOR PLAN.



GROUND PLAN.



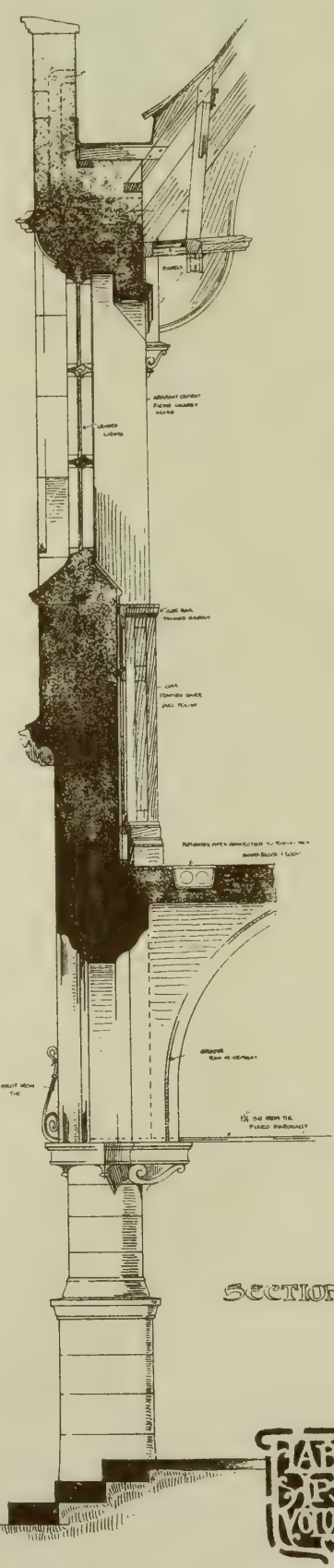
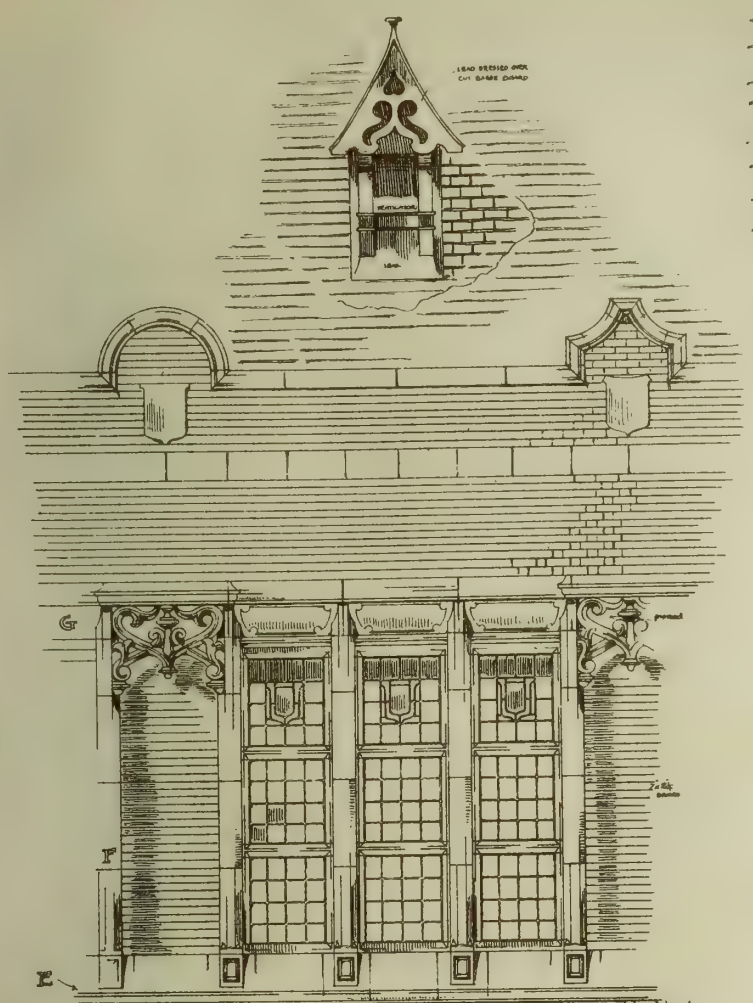
LONGITUDINAL SECTION.



DETAIL SECTION.



DESIGN  
FOR A  
PROVINCIAL  
MARKET-HALL.



DETAIL  
OF  
ONE BAY.  
FRONT ELEVATION.

SECTION.





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DESIGN FOR A PROPOSED BUILDING  
RIBA SOANE MEDALLION COMPETITION



MAR. 12. 1897.



"PHOTO-TINT" by James Akerman 6 Queen Square London W.

NCIAL MARKET HALL.

ON 1897. MEDAL OF MERIT AWARDED. J A SWAN

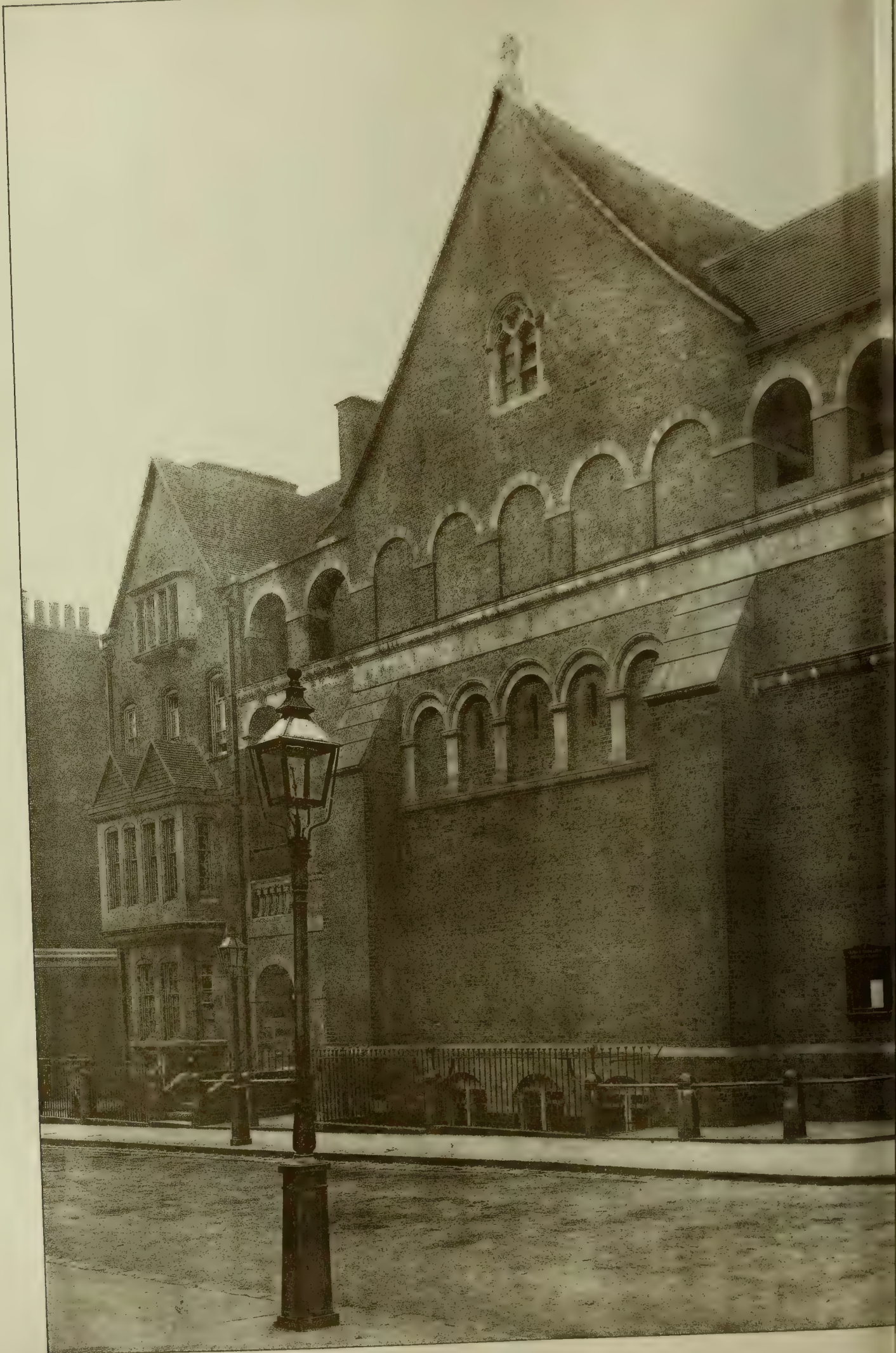










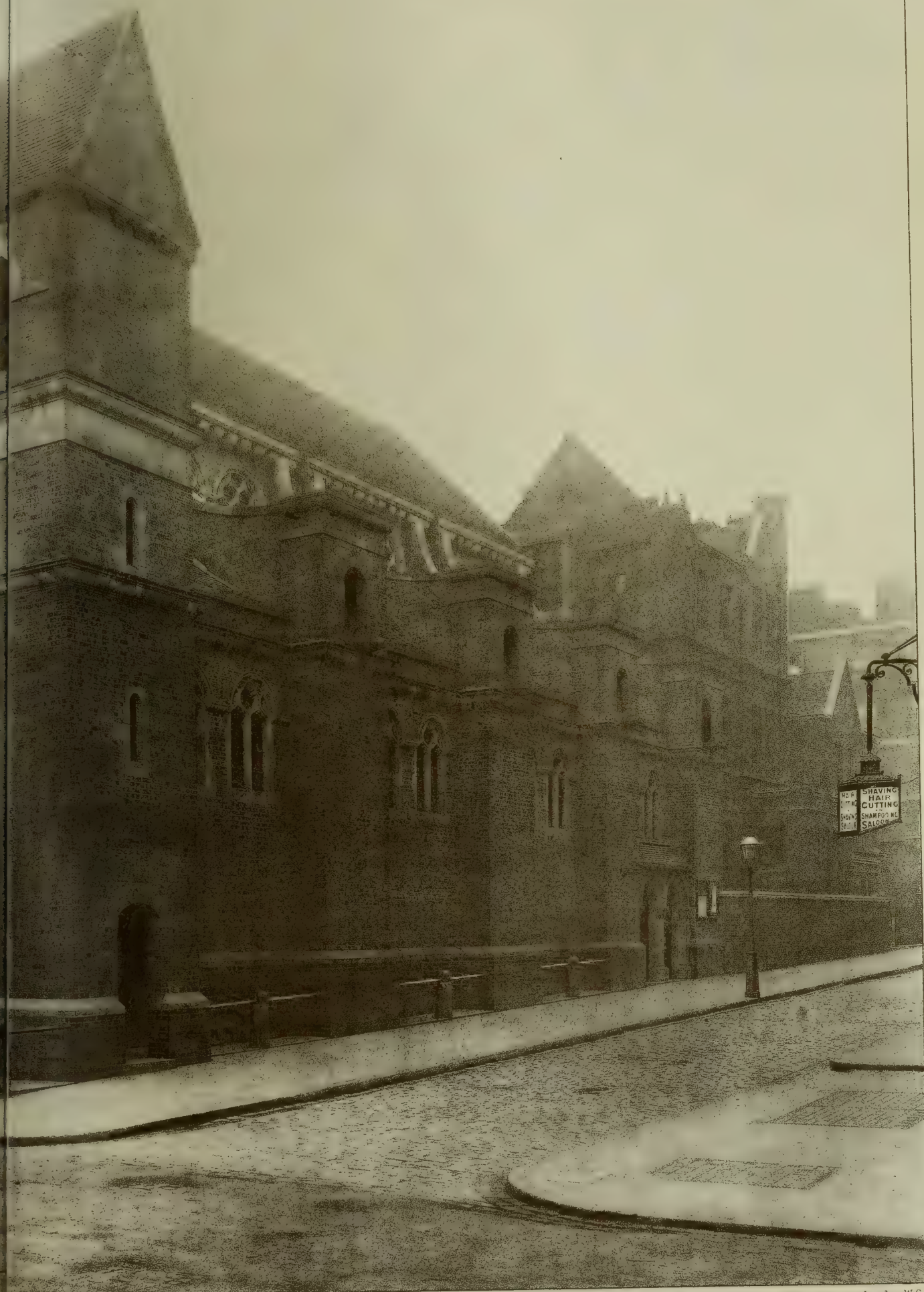




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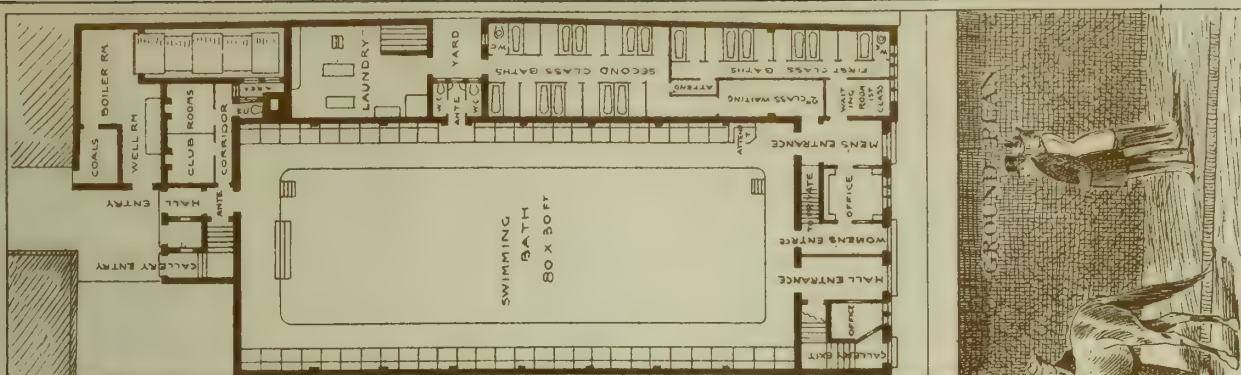
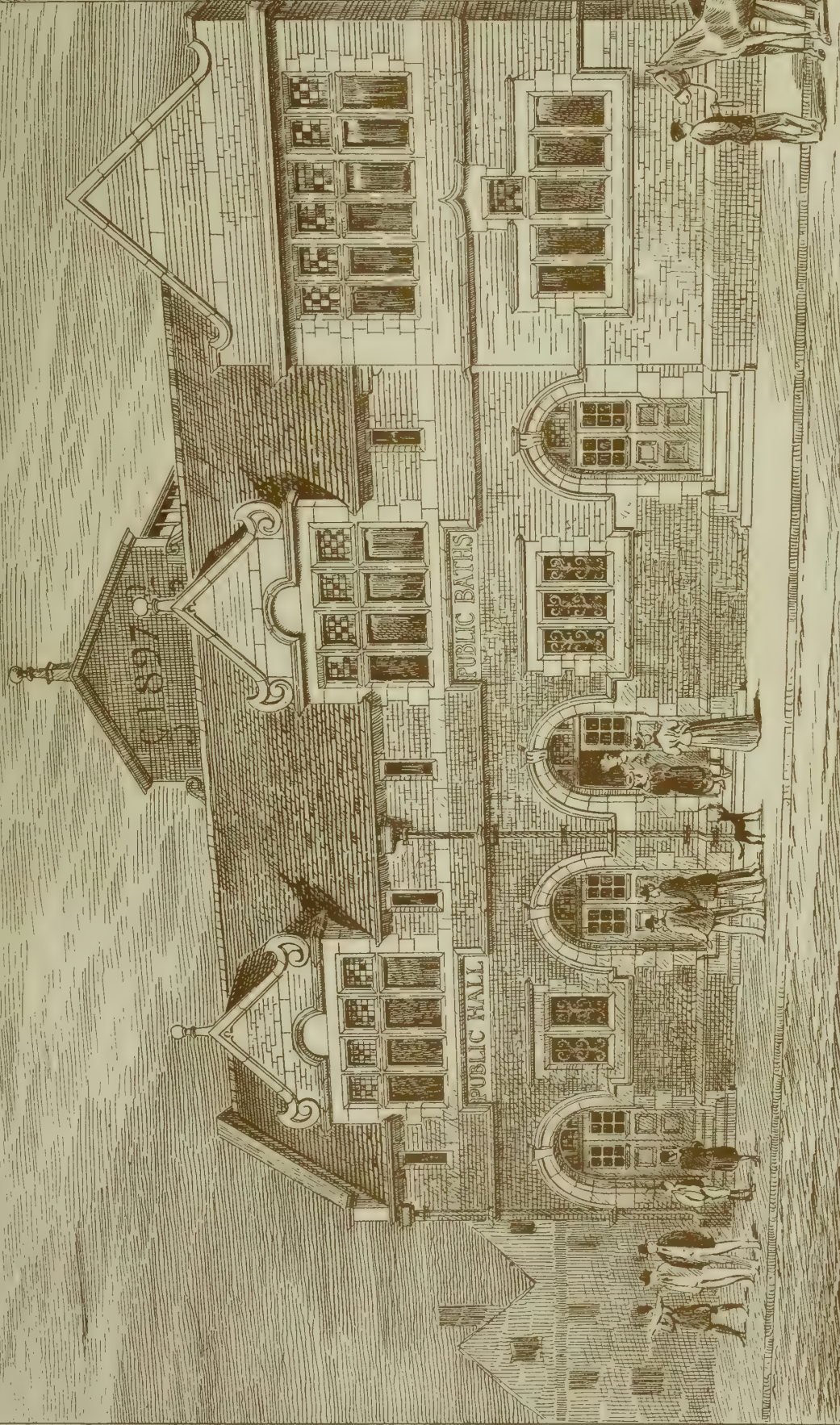
MESSRS BALFOUR & TURNER ARCHTS











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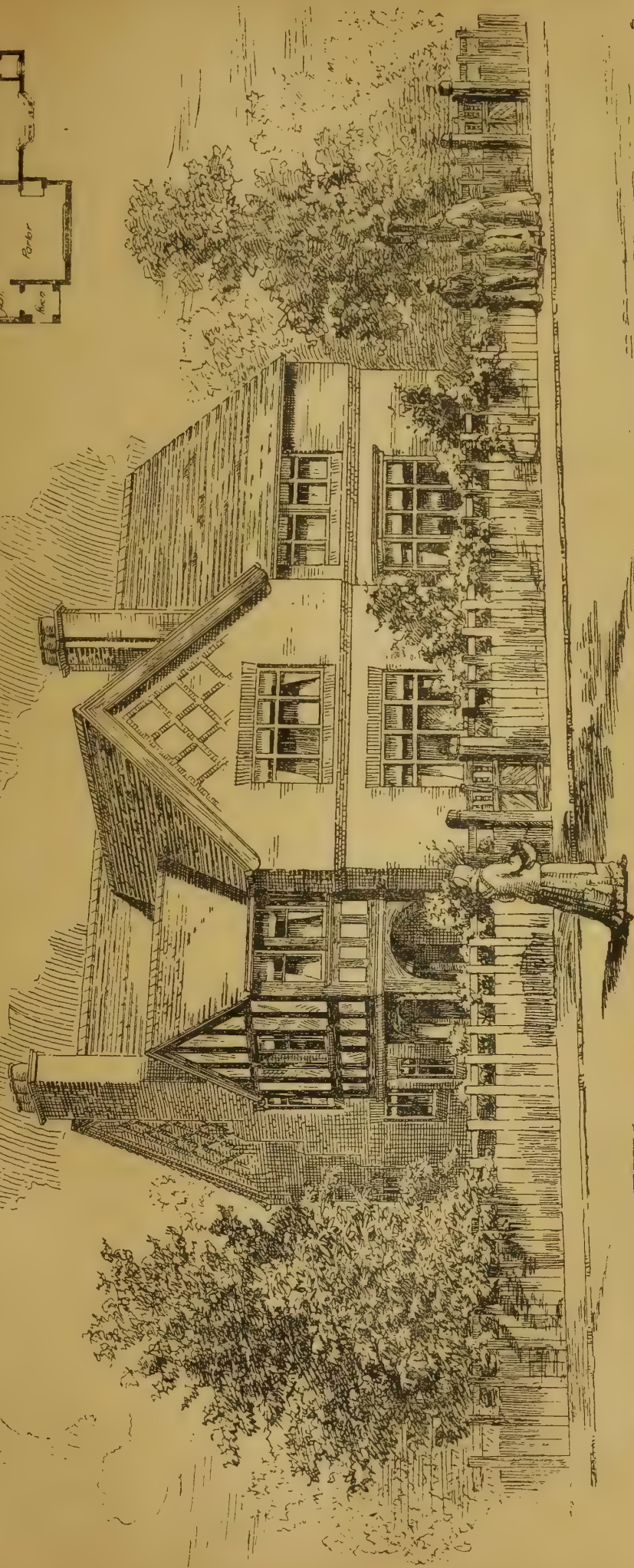






COTTAGES · PORT-SUNLIGHT · BIRKENHEAD ·

T. TALIESIN REES · ARCHT.



T. Taliesin Rees Architect  
Birkenhead



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIII., LIV., LV., LVI., LVII., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—R. L. I. M.—F. C. and Co.—M. A. S.—J. J. (Newcastle).—W. H. W. and Son.

## "BUILDING NEWS" DESIGNING CLUB.

## SIXTH LIST OF SUBJECTS.

F.—A District Council Hall for a Country District with moderate requirements. The buildings to comprise an assembly-hall, 70ft. by 30ft., with two retiring-rooms and a recessed stage or platform, 20ft. wide by 12ft. deep, adaptable for dramatic performances as well as public meetings. A Council Chamber, capable of seating 18 members, two officials, as well as the chairman at a horseshoe table. A separate table for the convenience of the Press is necessary, and a small gallery for the public, with a distinct entrance. The offices to consist of two rooms for the clerk's department, and two rooms for the surveyor's department, a public inquiry counter in both cases to be provided, screened off from, but forming part of, the clerks' rooms, which should measure 360ft. super. each. The surveyor's and clerks' private rooms will be about 14ft. square. A strong-room, 6ft. by 4ft., wanted in both departments, but no separate drawing office. The rate-collector's office and the sanitary inspector's office, each about 12ft. square, should also be approached from the main entrance vestibule. A cloak-room in connection with the Hall is desirable, and there must be a lavatory and cloakroom, &c., for the use of the council, and another ditto for the staff. A waiting-room, too, is to be provided adjoining the council chamber, which is to be on the first floor. The porter's office is to be near the main entrance. His living-rooms may be located on a second floor if desired, but a separate staircase in that case will be necessary. Three bedrooms, a living-room, scullery and larder, &c. Style optional. The site is a corner one in the main street, and has a frontage of 80ft. facing south, and a depth of 150ft., with a side entrance on the east return front. No projections beyond the south frontage line, so that the facade wall may be set back not more than 6ft. if desired. Economy to be observed. Materials, brick and stone. Sufficient drawings to show the design properly. Scale, 5ft. for the elevations, and 16ft. to the inch for plans.

## Correspondence.

## THE SOCIETY OF DESIGNERS.

To the Editor of the BUILDING NEWS.

SIR,—A letter in your issue of Oct. 9, 1896, which contains a statement with regard to the objects of the Society of Designers has been brought to the notice of my committee, and they

desire me to ask you to publish this disclaimer. They wish it to be clearly understood that they cannot be in any way responsible for any expression of opinion by individual members, however influential.

I inclose the society's book of rules, which will give you authentic information as to its aims.—I am, &c.,

LINDSAY P. BUTTERFIELD,

Hon. Sec. and Treas.

16, Coleherne Mansions, Bolton-gardens  
West, S.W., March 8.

## NOTES FROM EDINBURGH.

SIR,—We would call your attention to an error in your issue of the 5th inst. under "Notes from Edinburgh."

Our design for the rebuilding of North Bridge-street, which is now in the Exhibition of the Royal Scottish Academy, is incorrectly described by your correspondent as the second premiated design.

We shall be obliged if you will give publicity to this correction.—We are, &c.,

MARSHALL AND BRADLEY.

31, Old Queen-street, Westminster, S.W.,  
March 8.

## RE "T. DREW-BEAR, TOLPUTT, AND BROWN V. ST. PANCAS GUARDIANS AND A. AND C. HARSTON."

SIR,—My attention has been called to Mr. Harston's evidence on the question of bricks. I have had an opportunity of reading the shorthand writer's notes. In his cross-examination, Mr. Harston stated that my firm, Messrs. Eastwood and Co., Ltd., were not makers, but simply bought their bricks from a lot of little brick-makers. As this was stated publicly in open court, I should be grateful if you would allow me to inform Mr. Harston and others who may have the same opinion that we are brickmakers, manufacturing bricks in our fields at Shoeburyness (Essex), Otterham, Rainham (Kent), Halstow, Newington (Kent), Sittingbourne (Kent), Faversham (Kent), Teynham (Kent), West Drayton (Middlesex), Arlesey (Bedfordshire), and that our make last year was 83 millions.

I feel sure that Mr. Harston, whose character for integrity, justice, and fairness is so well known, must have made this statement, not knowing the above facts. His ignorance may, perhaps, have arisen from our invariably declining to supply bricks to any builder for work under Messrs. Harston. He specifies stock facings to be: "The best gold-burned, hard, square facing bricks, uniform in colour, specially picked in the brickyard, be they known locally as 'picked stocks,' 'bright stocks,' 'paviors,' 'malms' or by any other designation." It is impossible for any brickmaker to supply such a brick.—I am, &c.,

GEORGE E. WRAGGE.

In the case of John Edward Gray, of El-na-than, North Side, Clapham Common, S.W., builder, the discharge from bankruptcy has been suspended for five years, ending Feb. 8, 1902.

The London County Council agreed on Tuesday, after a discussion, with but three dissentients, to contribute £85,390, one-half of the estimated cost of widening the eastern end of Fleet-street between Bride-lane and Salisbury-court from 45ft. to 60ft. It was also decided to widen the opening of Vauxhall temporary bridge, at an outlay of £12,800 over the original estimate of cost.

A party of about fifty met at the Colonnade Hotel, Birmingham, on Thursday evening in last week, on the occasion of the first annual dinner of the Birmingham branch of the National Association of Master Plumbers. The local organisation was formed towards the close of 1895, the object being to advance trade interests. At the dinner the chair was occupied by the president of the branch (Mr. J. Osborn), and among others present were Messrs. A. E. Horton, J. Wright, W. Cowen and W. Bell (vice-presidents), T. E. Hill (hon. sec.), S. Latham (treasurer). In proposing "The National Association of Master Plumbers," the president said the association could boast a membership of about 800. Mr. Peattie, of Oxford, responded, observing that the association now comprised forty-five branches, of which that in Birmingham was the most prosperous of all. He submitted the toast of "The Birmingham and District Branch." This was replied to by Messrs. Hill and Latham. "Our City and Trade" was proposed by Mr. Latham, and responded to by Messrs. Stock and Clark. The health of "The President" was honoured on the proposition of Mr. Cowen, and Mr. Horton submitted "The Visitors."

## Intercommunication.

## QUESTIONS.

[11634].—Old Exam. Papers.—Will some one please say where old exam. papers of War Office, Office of Works, &c., may be obtained? Any advice as to best course to pursue for one of these appointments will oblige!—ENQUIRER.

[11635].—Pitch of Gallery Floor, &c.—Will any reader kindly inform me the best pitch for a gallery floor, suitable for a place of worship? Should also like to know the proper distance apart (from centre to centre) of fixed pews in a gallery, and also on ground floor?—D.

[11636].—Belgium.—Will any reader be so kind as to give me any information he may possess that would be helpful to an architectural student visiting Belgium for the first time on a sketching trip? The towns my brother and I propose visiting are Ostend, Bruges, Ghent, Ypres, and Brussels. The information I am anxious to gather is, What buildings in these towns will my time be best occupied in visiting and sketching?—H. E. DAVEY.

## REPLIES.

[11631].—Flooring.—Prepared or manufactured flooring has not to my knowledge been exported from Petersburg or the White Sea ports, such as Onega and Archangel; but boards for planing at the English ports are largely exported, and can be obtained prepared on the English system at any of the seats of trade on the East Coast, where a great business in preparing is carried on. The shipment of prepared flooring originated some years ago in Norway; but as their wood is now very small, the trade has largely moved into Sweden. Compared with the volume of boards that enters this country in the sawn state, it is a very small branch of the flooring trade. In the large ports of this country it is a decaying trade, and I question if Hull, Grimsby, and West Hartlepool combined average one cargo per year; the shipments are principally made to London for the public sales, to the small ports of the kingdom, and to the colonies.—WILLIAM STEVENSON, Hull Timber and Saw-Mill Co.

## CHIPS.

Colonel C. H. Luard, R.E., held an inquiry on Friday, at Radcliffe, into an application to the Local Government Board by the urban district council, for sanction to borrow £5,800 for the purchase and extension of the existing market, and £500 for the construction of a boundary wall at the town's yard.

Mr. Pittendrigh MacGillivray, sculptor, Edinburgh, has been commissioned to execute a bust in marble of Emeritus Professor Masson, to be placed in the Edinburgh University.

The Dewsbury Technical School, which was erected as an outcome of the Jubilee celebration, and cost, with land, about £7,000, is now inadequate to its needs. Plans for an addition to the present building, drawn by Mr. J. L. Fox, of Dewsbury, have been adopted. They provide for a wing of three stories, having a frontage to Carlton-road, and would cost from £3,000 to £3,500, which it is proposed to raise in celebration of the Diamond Jubilee.

The annual meeting of the shareholders in the Bath Stone Firms, Limited, was held at the Grand Pump Room Hotel, Bath, on Friday. Mr. C. J. Pictor, chairman, presided. The report recommended a dividend of 11 per cent. for the last half-year of 1896, making with the interim dividend paid in September, a dividend of 9½ per cent. for the year. It was unanimously adopted, and the retiring directors, Messrs. C. J. Pictor and R. E. Giles, were re-elected.

At the last meeting of the town council of Newcastle-on-Tyne, a letter was read from Messrs. Oliver and Leeson, architects, of that city, with reference to the lantern tower of St. Nicholas' Cathedral. In 1895, they presented an estimate of the cost of repairing the lantern, amounting in all to £1,765. The actual total cost of the work had been £1,782 15s. 5d., inclusive of architects' fees, clerk of works' salary, &c. The work had been inspected by the clerk of works and the foreman, who reported that everything was in perfect order, and free from the slightest crack or falling off of any of the pointing on any part of the structure. They recommended that there should be a periodical examination, and that the ironwork should be painted once every two years. The report and recommendations were adopted.

At the half-yearly meeting of the North Cornwall Railway Company, held on Tuesday, the chairman, Lord Wharnclyffe, reported that satisfactory arrangements had been made for constructing the line to Padstow; it was now being proceeded with, and he hoped it would be completed in about eighteen months.

An enormous landslip occurred on the east side of Shakespeare Cliff at Dover on Tuesday, the fall being very much more extensive than any of the previous slips which have taken place during the last few weeks. A great slice has fallen from the face of the cliff, extending from the top to the bottom, where many thousand tons of debris are now lying on the shore.



## Our Office Table.

THE Dean of Peterborough writes stating that the work of repairing the west front of his cathedral, as proposed by Mr. Pearson, has been proceeded with; that the portion of the north-west gable which it was found necessary to re-set has been taken down, and that the work of re-setting will be at once proceeded with. The stones have been found to be in an excellent condition, and will, with few exceptions, be replaced in their original positions. The mortar in which they were set had entirely lost its cohesive properties, and was reduced to a condition of fine loose powder. Dr. Ingram adds that the Dean and Chapter have sufficient funds, received or promised, to complete the work at this gable; but they still need a considerable sum to carry out the architect's recommendations for securing the permanent safety of the entire fabric.

A REPORT has been submitted to the vestry of St. James, Westminster, of Dr. James Edmunds, the medical officer of health, and Mr. Henry Monson, the surveyor, upon the by-laws proposed to be made by the London County Council under the provisions of the Metropolis Management Act of 1855 for regulating the dimensions, form, and mode of construction, and the keeping, cleansing, and repairing of the pipes, drains, and other means of communicating with sewers and the traps and apparatus connected therewith. Messrs. Edmunds and Monson's report is adverse to the proposals in their present form, and declares that portions of the proposed by-laws are prolix and obscurely worded; that some of the provisions are ambiguous or unintelligible; that some of the requirements are unnecessary and oppressive; and, finally, that in some points the requirements are inadequate. As these provisions affect property in London, the assessed annual value of which is some 40,000,000 sterling, the writers of the report regarded it as of extreme importance that they be so enunciated as to be perfectly intelligible to householders and to practical builders. It is therefore recommended that these proposed by-laws be carefully reconsidered before they are adopted. The text of these by-laws might be greatly simplified and shortened by grouping their provisions under proper headings, they think, notably in by-laws 1, 2, 7, and 8, while by-law 13 is, as drafted, unintelligible, and would often prevent improvements in old buildings lest they should be brought under the operation of these new regulations. Among other practical suggestions made in the report are these two: that drainage plans should be deposited by builder with local authority—a penalty to be affixed to falsification or neglect; and the builder should fill drains with water and demonstrate the action of the drains under the direction of vestry officials when required so to do.

THE First Commissioner of Works has hung three historical paintings, which were formerly in the members' old smoking-room at the House of Commons—now the third dining-room—in committee-room 10, in order that they may be fully inspected, with a view possibly to their removal to some picture gallery in London or the country. The largest of the three canvases is by Mr. G. F. Watts, R.A., and represents Alfred inciting the Britons to resist the Danes. The others are "The Pardon of Bertrand by Richard Cœur de Lion," by Cross, and "The Burial of Harold," from the brush of F. R. Pickersgill, R.A. All were executed not far from 50 years ago, at the request of the Fine Arts Commission, of which the late Prince Consort was chairman, for the decoration of the panels of the Houses of Parliament, and since 1895 until the present time they have been stowed away, there being no space available in which they could be displayed to advantage.

At the Society of Arts last week Mr. Matthew Webb gave a lecture on "Gesso," which he described as one of the minor by-ways of art, and a means of embellishment, touching, on the one hand, painting decoratively combined with a treated surface, and, on the other, modelled relief decoratively combined with colour. The 19th century, like the 16th, had its Renaissance, of which gesso was one of the manifestations. In the surface work of Egyptian sarcophagi traces of its use could be discerned, and it was combined with canvas for the purpose of embalming. From time immemorial it had been used as a priming to cover wood, as might be seen in many carved wooden statuettes at South Kensington, and it was employed to give surface finish before colouring to

stone-carved effigies, such as could be seen in Westminster Abbey and the Temple Church. The dry gesso work of the Early Florentines was especially beautiful, and, when engraved and gilded, delightful effects of light were produced. Fra Angelico and Lippo di Dalmasio had left us lovely examples of this combination of gesso engraving and gilding. Another application was what was called "brush-modelled gesso," which, however, except as a diaper or in thin floral decoration, was hardly suitable for design intended to cover any large area. Beautiful specimens of it were to be seen on Italian marriage coffers, of which many fine examples were at South Kensington. There was room for further development than had ever yet been attained, as gesso would take the graver and the knife, and the chasing of the gesso ground was really incipient carving.

THE forty-eighth annual report presented by the directors of the Prudential Assurance Company states that in the Ordinary branch the new annual premium income was £354,526, no less than £2,543,262 having been received in premiums during the year, an increase of £239,249 over the year 1895. The claims of the year amounted to £588,874, the number of deaths being 4,598, and 365 Endowment Assurances matured. In the Industrial branch the premiums received during the year amounted to £4,578,793, being an increase of £226,168. The total number of policies in force at the end of the year was 12,130,542, the average duration being almost exactly eight years. The total assets of the company, as shown in the balance sheet, are £27,059,111, being an increase of £3,143,221 over those of 1895.

An effigy of the late Richard Walmsley, of Lucknam (1816-93), on a so-called altar tomb has been placed in the parish church of Colerne. The effigy has been modelled and carved in statuary marble from Carrara by Mr. Henry Hugh Armstead, R.A. The tomb supporting the effigy is in Early Renaissance style. The mensa is made from black Devon marble. The front of the tomb below is of Corsham stone, and has four panels containing shields bearing arms. The tomb was designed by Mr. C. E. Ponting, F.S.A., diocesan surveyor of Marlborough, and the work was executed by Messrs. Harry Hems and Son, of Exeter.

The business transacted at Tokenhouse-yard during last week amounted to £65,142, which falls some £18,800 short of the total for the same week of last year. By way of comparison, it may be mentioned that for the month of February, 1896, the returns for property sold were £208,514, whereas these amounted to £318,909 in the same month of this year, showing an increase of over £110,000.

Morecambe is developing very rapidly. Messrs. Magnall and Littlewood, architects, of Manchester, are now engaged on two piers and three pavilions for Morecambe. The Winter Gardens is to have a new pavilion ready by Whitsuntide. Then the Morecambe Pier and Pavilion Co. (the old Pier Co.) are erecting a pavilion (by the same architects) to hold 3,000 people. The West End Pier is being decorated, &c., and will be reopened at Easter. The West End Pier is also being extended 600 yards seawards, so that the larger steamboats may be accommodated.

At a meeting of the parks and galleries committee of the Glasgow Corporation, on Friday, the preliminary arrangements with regard to the proposed Glasgow International Exhibition of 1901 were discussed. It was agreed that as soon as subscriptions were raised to the amount of £50,000, the town council should guarantee the sum of £5,000, as in the case of the exhibition of 1888. It was also agreed that the new art galleries and ground, not less in extent than in 1888, should be given over for the purposes of the exhibition, and that, if any surplus should arise from the exhibition, it should be applied to the art and science purposes under the charge of the galleries and museums committee.

At the Wandsworth County Court, on Monday, His Honour Judge Lushington, in suspending the discharge of a builder named Lower, of Clapham, who went bankrupt, having liabilities at £1,136, and whose assets only realised £8, regretted that he had to deal with another of the demoralising trade called the building trade. Its members seemed all the same way inclined, and he much deplored the present state of the trade.

Messrs. H. B. and A. F. James, contractors, of London and Grimsby, have been entrusted by the Manchester, Sheffield, and Lincolnshire Railway Company with the contract for the extension of their No. 2 Fish Dock at Grimsby, which will add about  $\frac{3}{4}$  acres to the present dock. They are commencing the works at once.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Heraldry in English Medieval Architecture," by W. H. St. John Hope, F.S.A. 8 p.m.  
Society of Arts. "Alloys," Cantor Lecture No. 1., by W. C. Roberts-Austen, C.B., F.R.S. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Main Drainage of London." Paper by H. A. Humphrey on "The Mond Gas-Producer Plant." 8 p.m.  
Society of Arts. "Progress of Australasia during the Queen's Reign," by James Bonwick. 8 p.m.

WEDNESDAY.—Society of Arts. "Music in England at the Queen's Accession," by J. Spencer Curwen. 8 p.m.  
Edinburgh Architectural Association. "Decorative Woodwork," by David J. Vallance, F.S.A., Scot., Royal Institute. 8 p.m.  
Edinburgh Architectural Society. "Interior Perspective," by W. W. Cumming, A.R.I.B.A. Dowell's Rooms. 8 p.m.

FRIDAY.—Architectural Association. "Eighteenth-Century Work," by J. A. Gutch, F.S.A. 7.30 p.m.

SATURDAY.—Building Trades' Exhibition, Agricultural Hall. Opening by the Lord Mayor and Sheriffs. 12 noon.

## CHIPS.

The Ormskirk Board of Guardians has resolved, by a small majority, to provide new board and committee rooms at an estimated cost of £1,500, and to invite competitive plans.

The removal of the Nuneaton Petty Sessions from the Newdegate Arms Hotel to the buildings which have just been completed by the Warwickshire County Council took place on Friday. The new structure occupies one of the most central positions in the town. The building includes a court-room, a mining school, a police superintendent's residence, a constable's house, half a dozen cells, an exercise yard, &c. It has been erected by Mr. Edward Williams, of Tamworth, at a cost of £6,000, from plans by Mr. Wilmot, the county surveyor.

The town commissioners of Bangor, Co. Down, have approved plans and a scheme by Mr. Chapple, C.E., for sewer extensions at Ballyhooley, estimated to cost over £3,000.

Contracts for the erection of a new fire-engine station in Paisley, at a total cost of £7,262, 6s. 4 $\frac{1}{2}$ d., have been accepted. The station will occupy a site bounded by Johnstone-street, Prussia-street, and Gordon's Loan, with a frontage to Johnstone-street.

The work of erecting a new railway station at Northwich is now in progress. The foundations of the outer walls have been dug. The work is in the hands of Mr. Braddock, contractor.

The committee of the Society for the Protection of Ancient Buildings recently wrote to the Dean of Exeter to ask what was being done with respect to the repair of the west front of the cathedral, and said to be in the hands of the cathedral surveyor, Mr. E. H. Harbottle, of that city. In the absence of the Dean, Canon Edmonds has written that the Chapter "do not wish to be brought into relations with your society in the matter of what we are doing at the west front of the cathedral."

Mr. Hugh McLachlan, the district surveyor of the western division of the city, has issued a circular to the members of the Commission of Sewers, protesting against the action of that body at its last meeting, when it was resolved to appoint another surveyor in his place. He asks the members to give him a hearing, and to make a full investigation into the action of the streets committee.

A Local Government Board inquiry was held by Mr. C. H. Luard at the Council Chamber, Radcliffe, Lancs, on Thursday, the 4th inst., respecting the application of the district council to borrow £5,800 for the purchase and extension of the market and £500 for improvements to town's yard. Mr. W. L. Rothwell, surveyor, produced and explained the plans.

A new Congregational chapel was opened at Harpenden, Herts, on Wednesday week. It is Gothic in style, and is built of red bricks with stone dressings, with wood-block flooring. Mr. Arthur E. Anscombe, of Harpenden, is the architect, and Mr. Kingerlee, of London, the builder.

Mr. E. J. Physick, sculptor, has just completed the erection of the memorial, in marble, of the late Right Hon. H. C. E. Childers, over the grave in Cantley Churchyard, Yorkshire.

At Saturday's meeting of the Tamworth Board of Guardians, the building committee reported that the workhouse was in a bad state of repair, and that an expenditure of several hundreds of pounds was necessary to put it in order. The board instructed Messrs. Newton and Cheate, architects, to draw up specifications, and to give an estimate for the work.



## Trade News.

### WAGES MOVEMENTS.

**DOUGLAS, ISLE OF MAN.**—The lock-out of plasterers at Douglas is approaching settlement. The executive of the Douglas Master Builders' Federation have consented to concede the men's demands, with very slight modifications, which the men will probably accept. Non-union labourers are not to be employed to serve plasterers, all the lock-outs are to be reinstated, and wages advanced. This decision will be brought before the Masters' Federation for confirmation. The men guarantee to provide the masters with unionist labourers during the summer season. In former years this has not been done. The executive's propositions are regarded as certain of adoption by the Federation.

**GLASGOW.**—The master joiners in the Glasgow district have asked their men to postpone consideration of the proposed advance for two or three months. At present the men receive 9d. per hour, which is the highest rate in the history of their trade. They ask for an advance of ½d. per hour.

### CHIPS.

**Mr. David Mackenzie, county surveyor, (Nairn,** has been appointed Master of Works for the Dunfermline district, at a salary of £250 per annum.

A London syndicate has applied to the town council for permission to erect an Eiffel Tower near The Parade, Yarmouth. A site has been assigned next the Beach Gardens, and the plans provide for an openwork steel tower, with a circular railway running outside for the ascent and descent of passenger-cars. At the summit there will be a view platform, and a pavilion at the base. The whole is to be electrically lighted.

The police commissioners of Wishaw, N.B., decided on Monday to instruct Mr. W. Robertson Copeland, C.E., of Glasgow, to investigate and report as to whether the Gair district is capable of supplying a population of 17,000 with 30 gallons of water per head per day, and if so, whether a supply of water at the above-mentioned rate per head can be obtained from Gair for the next twenty years, taking the natural increase of population into consideration.

The building of a new church has just been commenced at Castlebar, from plans by Mr. Walter G. Doolin, of Dublin.

By the decisive majority of 32 votes to 15, the Bristol Town Council refused, on Tuesday, to embark on a peddling policy on the question of municipal buildings; and rejected a proposal to spend £10,000 on enlarging and patching up the existing inadequate council chamber.

The annual meeting of the Aberdeen Building Trades Federation was held on Friday night in the Trades Hall. The report and financial statement were approved. Office-bearers were appointed for the ensuing session as follows:—President, Mr. George Maclean, joiner; vice-president, Mr. Wm. Leask, plumber; treasurer, Mr. A. R. Sinclair, painter; and secretary, Mr. James Stephen, slater.

A memorial to the late Canon Wise has been placed in Truro Cathedral, in the form of stained glass, for the two eastern lights of the windows of the north choir aisle, harmonising with the windows already fixed in the cathedral. The subject (which forms part of the series planned for the whole building) is "The Apostolic Fathers." In the eastern lancet window is represented St. Clement of Rome, with the anchor, in episcopal robes, and wearing the early form of the papal tiara. On one side is St. Ignatius of Antioch, and on the other side is St. Polycarp. Below is depicted St. Clement in his youth being instructed by St. Peter and St. Paul. In the other light is St. Pantenus; with him are St. Irenaeus and St. Justin Martyr.

At the meeting of the Bradford Town Council yesterday, the minutes of the finance and general purposes committee, which included the appointment of a sub-committee for the purpose of carrying out the resolution adopted by the council as to the proposed extension of the Town-hall buildings and erection of an art gallery, were referred back. This means the shelving of the scheme.

St. Peter's Church, Powick, was reopened on Thursday week, after a restoration. A year ago the roof of this church was found to be in a dilapidated condition, and it was necessary to remove the roof of the nave and rebuild the arcade walls. This has been done under the direction of the diocesan architect (Mr. Hopkins). During the restoration of the nave roof it was found that the old roofs to the side aisles still existed, hidden from view by a modern covering of plaster. The plaster removed and superseded, these old roofs, with their moulded timbers, are once more presented to view. The transept roofs have also been restored in a similar manner to those of the nave.

A Local Government Board inquiry was held on Tuesday, at the King's Heath Institute, by Mr. Walter A. Ducat, an inspector of the board, respecting applications made by the King's Norton Rural District Council for sanction to borrow £6,000 for the erection of two chapels and an entrance lodge at the new cemetery at Brandwood End, and £1,300 for the purchase of land adjoining the police station at King's Heath, as a site for council offices, a fire station and depot. There was no opposition to the applications.

In consequence of the decision of the committee to proceed to the final completion of the work of restoration of St. Bartholomew the Great, West Smithfield, work is now actively proceeding in the Lady chapel. The houses which have blocked a portion of the north side for over 250 years have been removed, and a considerable portion of the original flint-and-stone work is exposed thereby. The dividing wall between the church and Lady chapel, which is of brick, and has acted as a safeguard from fire while the chapel was in secular occupation, will not be removed until the work is nearer completion.

At a public meeting at Acton, called by the chairman of the urban district council, it was unanimously resolved that the Acton commemoration of the Queen's long reign should take the form of a cottage hospital and nursing institution, Mr. Passmore Edwards having given £2,000 for the building, and Lord Rothschild and Mr. Leopold Rothschild an eligible site. A representative committee was formed to carry out the project.

The new wall on the south side of the harbour at Ayr is all but completed, and has cost upwards of £20,000. It is proposed to spend £5,000 in rebuilding a portion of the wall on the north side, and the trustees have under consideration a proposal to light the harbour with electricity.

At a meeting, on Tuesday, of the Freeman's Trustees, at Coventry, a letter was read from a firm of London architects offering to take 6½ acres of land at Stoke, they having already agreed to take 23 acres from the Nuneaton Grammar School Trustees, adjoining the Freeman's property. It was stated that the houses to be built would be of value of about £500 each. The meeting was favourably disposed to the scheme, and appointed a committee to report. Should the plan be fully developed, some 500 houses will be erected.

In commemoration of Canon J. D. Lewis's 25 years' work in the parish of St. Ann, Nottingham, a stained-glass window was unveiled in the church last week. The window, which is a five-light one, with a large amount of geometrical tracery, gives an effective representation of the Ascension of our Lord, and has been designed and executed by Mr. A. O. Hemming, Margaret-street, London.

The Plymouth Town Council decided, on Monday, to celebrate the Diamond Jubilee by erecting a free museum and art gallery. Besides containing objects of scientific interest, the museum will be devoted to historical subjects illustrative of the progress of the naval and maritime advancement of England since the days of Drake, Hawkins, Grenville, and other Devon worthies of the Elizabethan period. The art gallery will be divided into sections, one to be associated with events of the 16th century, another with the period between the 17th century and 1837, while the third will be especially identified with the reign of Queen Victoria.

The parish church of Titchwell, near Hunstanton, was reopened after restoration, effected at a cost of about £500. The contract has been carried out by Messrs. Cornish and Gaymer, of North Walsham.

Colonel Hasted, R.E. (engineering inspector), and Mr. E. P. Burd (inspector of Local Loans Acts and By-laws) held an inquiry at the Scarborough Town Hall on Friday with reference to the application of the corporation for a provisional order. The corporation seeks powers, among other things, to borrow money for the construction of the marine drive and sea-wall, authorised by the Act of 1889. Mr. J. E. Everett, the engineer for the construction of the drive and wall, in explaining the works to the inspectors, said that the estimated cost of the whole scheme was now £73,463. The contract has been let to Messrs. B. Cooke and Son, of Battersea.

St. Mark's, New Swindon, which was built about fifty years ago from designs by the late Sir Gilbert Scott, R.A., has recently been enlarged by an extra bay to the chancel, a south chapel and a vestry on the north side, with additional space for the organ over. An arcade of three bays divides the chancel from the chapel, and the ceilings of both are painted; the former is of a pointed barrel type, and the latter flat divided into panels by ribs, having gilt bosses at their intersections. The east window of the chapel is about to be filled with painted glass by Mr. C. E. Kempe. The new building was consecrated on Thursday week. The architect is Mr. Temple Moore, of Hampstead, who also designed the screen, stalls, and organ case, which were placed in the church some years ago.

## LATEST PRICES.

### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6 to	£6 0 0
Rolled-Steel Joists, English.....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates.....	6 15 0 "	7 10 0
Bar Iron, good Staffs.....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 10 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	7 17 6 "	8 0 0
Best Sneathill.....	10 0 0 "	10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£10 15 0 ..	£11 0 0
Best ditto.....	11 5 0 "	11 10 0
Cast-Iron Columns.....	Per ton.	Per ton.
Cast-Iron Stanchions.....	£6 0 0 to	£8 10 0
Cast-Iron Sash Weights.....	6 0 0 "	8 10 0
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0 "	5 15 0
4in. to 6in.....	5 5 0 "	5 10 0
7in. to 24in. (all sizes).....	4 15 0 "	5 0 0
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]		

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to	£110s.
Hot Blast, ditto.....	57s. 6d. to	£62s. 6d.
Wrought-Iron Tubes—Discount off Standard Lists 17½p.c.		
Gas-Tubes.....	75p.c. Fittings 77½p.c.	
Water-Tubes.....	70 "	72½
Steam-Tubes.....	62½ "	65
Galvanised Gas-Tubes.....	60 "	62½
Galvanised Water-Tubes.....	55 "	57½
Galvanised Steam-Tubes.....	45 "	47½

	10cwt. casks. 5cwt. casks.	Per ton.	Per ton.
Sheet Zinc, for roofing and working up.....	£22 15 0 to	£23 15 0	
Sheet Lead, 3lb. per sq. ft. super.....	13 17 6 "	14 17 6	
Pig Lead, in lewt. pigs.....	13 5 0 "	14 5 0	
Lead Shot, in 28lb. bags.....	16 5 0 "	17 5 0	
Copper Sheets, sheathing and rods.....	61 10 0 "	64 0 0	
Copper, British Cake and Ingot.....	53 0 0 "	53 10 0	
Copper, Straits.....	60 5 0 "	60 15 0	
Tin, Straits.....	64 10 0 "	65 0 0	
Do., English Ingots.....	17 10 0 "	17 12 6	
Spelter, Silesian.....			
Cut Clasp Nails, 3in. to 6in.....	£3 15 0 "	9 15 0	
Cut Floor Brads.....	8 10 0 "	9 10 0	
Wire Nails (Points de Paris)			
0 to 7 8 9 10 11 12 13 14 15 B.W.G.			
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9 per cwt.			

### TIMBER.

	per load £13	5 0 to	£16 10 0
Teak, Burmah.....	11 10 0 "	15 0 0	
" Bangkok.....			
Quebec pine, pitch.....	2 0 0 "	4 0 0	
" yellow.....	5 0 0 "	6 0 0	
" Oak.....	3 15 0 "	5 10 0	
" Birch.....	3 10 0 "	4 15 0	
" Elm.....	2 15 0 "	4 0 0	
" Ash.....	2 15 0 "	3 15 0	
Dantsic and Memel Oak.....	2 15 0 "	4 15 0	
Fir.....	2 10 0 "	4 15 0	
Wainscot, Riga p. log.....	4 10 0 "	5 10 0	
Lath, Dantsic, p.f.....	5 0 0 "	6 10 0	
St. Petersburg.....	8 0 0 "	9 0 0	
Greenheart.....	0 1 9 "	0 2 0	
Sequoia, U.S.A. per cube foot			
Mahogany, Cuba, per super foot			
1in. thick.....	0 0 4½ "	0 0 6	
" Honduras.....	0 0 5 "	0 0 6½	
" Mexican.....	0 0 4 "	0 0 5	
Cedar, Cuba.....	0 0 4½ "	0 0 5	
" Honduras.....	0 0 4 "	0 0 5	
Satinwood.....	0 0 7 "	0 1 0	
Walnut, Italian.....	0 0 3½ "	0 0 7	
Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in. —			
Quebec, Pine, 1st.....	£20 0 0 to	£23 0 0	
" 2nd.....	14 10 0 "	16 10 0	
" 3rd.....	7 0 0 "	10 10 0	
Canada Spruce, 1st.....	9 10 0 "	11 0 0	
" 2nd and 3rd.....	7 10 0 "	8 15 0	
New Brunswick.....	7 10 0 "	8 0 0	
Riga.....	7 10 0 "	8 10 0	
St. Petersburg.....	9 10 0 "	13 10 0	
Swedish.....	8 10 0 "	16 10 0	
Finland.....	9 0 0 "	9 10 0	
White Sea.....	10 10 0 "	17 0 0	
Battens, all sorts.....	5 0 0 "	20 0 0	
Flooring Boards, per square of lin. —			
1st prepared.....	0 9 0 "	0 16 0	
2nd ditto.....	0 7 6 "	0 12 6	
Other qualities.....	0 5 9 "	0 7 0	
Staves, per standard M:—			
Quebec pipe.....			
U.S. ditto.....	35 0 0 "	43 0 0	
Memel, cr. pipe.....	230 0 0 "	240 0 0	
Memel, brack.....	200 0 0 "	210 0 0	

### OILS.

	per ton £14	17 6 to	£15 7 6
Linseed.....	25 5 0 "	27 0 0	
Rapeseed, English pale.....	20 10 0 "	26 15 0	
Do., brown.....	14 17 6 "	15 7 6	
Cottonseed ref.....	29 0 0 "	30 0 0	
Olive, Spanish.....	23 10 0 "	24 0 0	
Seal, pale.....	27 15 0 "	28 0 0	
Cocoonut, Cochin.....	23 10 0 "	23 12 6	
Do., Ceylon.....	23 0 0 "	24 10 0	
Palm, Lagos.....	19 0 0 "	20 0 0	
Oleine.....	0 6 3 "	0 7 6	
Lubricating U.S..... per gal.	0 4 9 "	0 6 6	
Do., black.....	1 2 0 "	1 5 0	
Tar, Stockholm..... per barrel	0 12 6 "	0 15 0	
Archangel.....	21 0 0 "	21 10 0	
Turpentine, American..... per ton			



## LIST OF COMPETITIONS OPEN.

Swansea—Workhouse Additions .....	10gs. (merged in commission) .....	G. B. Haynes, Clerk, 8, Fisher-street, Swansea .....	Mar. 17
Enniskillen—Town Hall (£7,500 limit) .....	£50, £20, £10 .....	Thomas Elliott, Borough Surveyor, Enniskillen .....	" 20
Christiania—Railway Terminal Station Plans .....	£555 10s., £222 4s. 6d., £111 2s. 3d., £55 11s. .....	Railway Offices, 6, Victoria-terrace, Christiania .....	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Wash- ington Browne, A.R.S.A., Edinburgh, Assessor) .....	£100 (merged in 4 per cent.), £50, £25 .....	A. Macdonald, Town Clerk, Hillock House, Govan .....	" 31
Sheffield—Westbar Fire & Police Station (local Architects only) .....	Four premiums of £15 .....	H. Bramley, Town Clerk, Sheffield .....	" 31
Guernsey—States Assembly Hall (£15,000 limit) .....	£100, £50 .....	N. Domaille, Supervisor of Harbour, States Offices, Guernsey .....	April 17
Long Buckley, Northants—Water Supply Scheme .....	50gs. .....	William Willoughby, jun., Clerk, Daventry .....	" 21
Halifax—Police Station and Court House (no Assessor) .....	£50, £25 .....	Keighley Walton, Town Clerk, Halifax .....	" 30
Elne, France—Water Supply Scheme (3,300 inhabitants) .....	£100, £50, £25 .....	La Marie, Elne, Pyrénées Orientales .....	July 1
Carlton, Victoria—Children's Hospital .....	50gs. (merged in 5 p.c.), 20gs., 10gs. .....	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia .....	Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home .....		A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth .....	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

St. Blazey—Church Roofs Restoration .....	Committee and Vicar .....	E. Sedding, Architect, 12, Athenæum-street, Plymouth .....	Mar. 13
Belper—Moulding and Fitting Shops .....	Park Foundry Co. .....	Maurice Hunter, Belper .....	" 13
Siddell—Two Houses .....	Lancashire Asylums Board .....	Jackson and Fox, Architects, 22, George-street, Halifax .....	" 13
Warwick—Two Lodges and Twelve Cottages .....	Committee .....	F. C. Hulton, Clerk, County Offices, Preston .....	" 13
New Swindon—Conservative Club .....	Capt. Nicholson .....	Wm. Drew, M.S.A., 22, Victoria-street, Swindon .....	" 13
Whitby—Villas, Downinner Hill .....	Co-op. Wholesale Soc., Manchester .....	J. J. Mulligan, Architect, 77, Baxtergate, Whitby .....	" 13
Dola—Creamery Building .....	Co-op. Wholesale Soc., Manchester .....	Wm. Stokes, Mulgrave-street, Limerick .....	" 13
Kilmihill, West Clare—Creamery .....	Co-op. Wholesale Soc., Manchester .....	Wm. Stokes, Mulgrave-street, Limerick .....	" 13
Effin, Charleville—Creamery .....	Lancashire County Council .....	Wm. Stokes, Mulgrave-street, Limerick .....	" 13
Galgate—Police Station .....	T. Jones, George Brewery .....	H. Littler, Architect, 21, Pitt-street, Preston .....	" 13
Dorchester—Additions to Junction Hotel .....	School Board .....	A. L. T. Tilley, Architect, 16, Cornhill, Dorchester .....	" 13
Aberaman—Additions to Pen-y-lan Inn .....	Westmoreland Agricultural Society .....	T. Roderick, Architect, Clifton-street, Aberdare .....	" 13
Carnarvon—Schools .....		R. Lloyd Jones, Architect, 14, Market-street, Carnarvon .....	" 13
Wallingford—Institute, St. Martin's-street .....		S. C. Johns, M.S.A., Wallingford .....	" 13
Kendal—Fitting-Up Showground .....		G. L. Hoggarth, Secretary, Kendal .....	" 13
Kendal—House, Smithton's Yard .....		Stephen Shaw, F.R.I.B.A., Kendal .....	" 13
Hull—Two Villas, Cottingham-road .....		Freeman, Son, and Gaskell, Architects, 11, Carr-lane, Hull .....	" 13
Yarmouth—Additions to Shop, St. Nicholas-road .....		J. E. Teasdel, Architect, 3, Queen-street, Great Yarmouth .....	" 13
Stoke-on-Trent—Methodist New Connexion Chapel and Schools, Shelton-road .....	Jas. Beilby .....	A. Wood, Architect, Regent House, Hanley .....	" 13
Driffield—Alterations Estcourt House .....	Carlisle Rural District Council .....	J. Shepherdson, Architect, Driffield .....	" 13
Cambeck—Alterations to Two Bridges .....		The Clerk, 25, Lowther-street, Carlisle .....	" 13
Consett—House .....	Diocesan Building Committee .....	Jas. Almond, 14, Constance-street, Consett, Co. Durham .....	" 13
Londonderry—New Bishop's Palace .....	Board of Guardians .....	S. P. Close, Architect, 53, Waring-street, Belfast .....	" 15
Gainsborough—Wards, Mortuary, and Workhouse .....	Building Committee .....	Eyre and Southall, Architects, Gainsborough .....	" 15
Carriekfergus—Masonic Hall .....	School Board .....	J. Tuke, Hon. Sec., Carriekfergus .....	" 15
Sowerby Bridge—Twelve Houses, Clay-street .....	Aberystwith School Board .....	S. Wilkinson, Architect, Sowerby Bridge .....	" 15
Queensbury—Schools, Fox Hill .....	School Board .....	J. Walshaw, Clerk, Crown-street, Halifax .....	" 15
Ebbw Vale—School (157 places) .....	Jas. Macfarlane .....	J. Alex. Jones, Clerk, Blairstown, Mon. .....	" 15
Glass Houghton—Schools .....		Geo. F. Pennington, M.S.A., Bridge-street, Castleford .....	" 15
Nottingham—Premises, Canal-street .....		J. W. J. Barnes, Friar-lane, Nottingham .....	" 15
Middlesbrough—House, Clareville-road .....		J. M. Bottomley, Architect, 28, Albert-road, Middlesbrough .....	" 15
Kinsale—Additions to Convent of Mercy .....		S. F. Hynes, F.R.I.B.A., 41, South Mall, Cork .....	" 15
Girlington—Five Houses and Shops, Waterside-road .....		J. Hainsworth, 376, Brownroyd, Bradford .....	" 15
Darlington—St. Cuthbert's Parish Hall .....	West Riding County Council .....	Clark and Morcrop, Architects, Darlington .....	" 15
Deepcar, Sheffield—Police Station .....	Building Committee .....	J. Vickers Edwards, County Surveyor, Wakefield .....	" 15
Carriekfergus—Masonic Hall .....	Corporation .....	John Take, Hon. Sec., Carriekfergus .....	" 15
Cardiff—Superintendent's House, Roath Park .....		W. Harpur, Borough Engineer, Cardiff .....	" 15
Bradford—Four Through Houses, East-parade .....		A. Sharp, Architect, Albany Buildings, Bradford .....	" 15
Brecon—Cattle Stalls, &c., Market .....	Corporation .....	Rhys Davies, Borough Surveyor, Brecon .....	" 15
Bradford—Six Houses, Prospect-road .....		J. H. Dixon, Architect, 90, Heap-lane, Bradford .....	" 15
Bonnyrigg, N.B.—Church Mission Hall .....	R. Wiggen .....	Alex. Stewart, C.E., 7, Blunton-terrace, Edinburgh .....	" 15
Middlesbrough—Alterations to Shops, Newport-road .....		W. G. Roberts, Architect, 61, Albert-road, Middlesbrough .....	" 16
Leeds—Refracting Oxford-place Chapel .....	Gillingham School Board .....	Danby and Thorpe, Joint Architects, Leeds .....	" 16
New Brompton—Cookery Centre, Balmoral-road .....	Trustees .....	E. T. Atcheson, Clerk, 8, Waterloo-road, New Brompton .....	" 16
Morley—Working Men's Club, Fountain-street .....	Urban District Council .....	S. B. Birds, Architect, 47, High-street, Morley .....	" 16
Weston-super-Mare—Shelter, Grove Park .....	School Board .....	Hugh Nettleton, Surveyor, Town Hall, Weston-super-Mare .....	" 16
Sheffield—Additions to Gladless-road Schools .....	Staffordshire County Council .....	C. J. Innocent, Architect, 17, George-street, Sheffield .....	" 16
Huby, near Weston—Farnhouse and Outbuildings .....		W. H. Beavers, A.R.I.B.A., 25, Bond-street, Leeds .....	" 16
Burntwood, Staffs—Four Attendants' Houses, Asylum .....		W. H. Chadde, County Engineer, Stafford .....	" 16
Whitehouse, Aberdeen—Stables .....		Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen .....	" 16
Bradford—Exchange Restaurant .....	J. L. Walton .....	Milnes and France, Architects, Bradford .....	" 17
Blackhill—House in Queen-street .....	Royal Engineers .....	G. T. Wilson, Architect, 121, Durham-road, Blackhill .....	" 17
Birmingham—Structural Works (Three Years) .....	Board of Guardians .....	Director of Army Contracts, War Office, Pall Mall, S.W. .....	" 17
Mansfield—Workhouse Infirmary .....	Metropolitan Asylums Board .....	G. H. Hibbert, Clerk, Mansfield .....	" 17
Caterham—Nurses' Home, Imbecile Asylum .....	Metropolitan Asylums Board .....	T. Duncombe Mann, Clerk, Norfolk-street, Strand, W.C. .....	" 17
Winchmore Hill—Isolation Pavilion, Northern Hospital .....	Committee .....	T. Duncombe Mann, Clerk, Norfolk-street, Strand, W.C. .....	" 17
St. Enoder, Cornwall—Additions to National School .....	Corporation .....	Rev. W. Horsburgh, St. Enoder Rectory, Cornwall .....	" 17
Oswestry—Sheep Pens in Smithfield .....		R. O. Wynne-Roberts, Borough Surveyor, Oswestry .....	" 17
Shillington—Adding Schools to Wesleyan Chapel .....		Thos. Prutton, Shillington .....	" 17
Lanchester—Three Houses .....		G. T. Wilson, Architect, 121, Durham-road, Blackhill .....	" 17
Ulverston—Building Wesleyan Chapel .....	Watergate Brewery Co. .....	T. Birkett, Hon. Sec., 20, Market-street, Ulverston .....	" 18
Huddersfield—Shed at Archill Works .....	F. Gray .....	J. Kirk and Sons, Architects, Huddersfield .....	" 18
Huddersfield—Bottling Stores .....	Corporation .....	H. D. Arnott, M.S.A., High-street, Gorleston .....	" 18
Gorleston—Two Houses on Cliff .....	Stoke Damerel Board of Guardians .....	C. C. S. Benning, Town Clerk, Dunstable .....	" 18
Dunstable—Alterations, Town Hall .....	Earl Percy .....	A. Gard, Clerk, 19, St. Aubyn-street, Devonport .....	" 18
Devonport—Alterations, Workhouse Infirmary .....		—, Kyle, Estate Offices, Alnwick Castle .....	" 18
Alnwick—Alterations to Castle Dairy .....	Board of Guardians .....	Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen .....	" 18
Aboyne—Isolation Hospital .....	Very Rev. Bernard Kelly .....	Wm. Jacka, New Quay, Cornwall .....	" 19
New Quay—Two Shops, Bank-street .....	Belfast Banking Co. .....	H. Douglas, Giggleswick, Yorkshire .....	" 20
Omagh—Labourer's Cottages .....	Gas Committee .....	E. J. Toye, Architect, Strand, Derry .....	" 20
Gigla, N.B.—Three Cottages .....	Churchwardens .....	Vincent Craig, Architect, 5, Lombard-street, Belfast .....	" 20
Cashliff—Roman Catholic Church .....	J. and H. Yates, Wisbech .....	R. H. Townley, Superintendent, Municipal Offices, Leeds .....	" 20
Portrush—Bank .....	Building Committee .....	G. C. Traylen, Diocesan Surveyor, Broad-street, Stamford .....	" 20
Leeds—Purifier House, Meadow-lane .....	Corporation .....	Geo. Thorpe, Architect, Exchange-square, Wisbech .....	" 20
Langtoft—Restoration of Roof, North Aisle Church .....	Corporation .....	A. G. Dalzell, Architect, 15, Commercial-street, Halifax .....	" 20
King's Lynn—Alterations to Prince of Wales' Inn .....		R. B. Andrews, Hon. Sec., 104, Clifton Park-avenue, Belfast .....	" 20
Halifax—Warehouses, Union-street South .....		Rev. J. Morris, Blaencraen Farm, Maester .....	" 20
Belfast—Masonic Hall, Crumlin-road .....		T. Loftos, Town Clerk, Blackburn .....	" 22
Blaencraen—Sion Welsh Independent Chapel and Schools .....		F. Baker, Borough Engineer, Middlesbrough .....	" 22
Blackpool—Cemetery Registrar's House .....		W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff .....	" 22
Middlesbrough—Entrance Lodge, Ludthorpe Cemetery .....	School Board .....	J. T. Bascombe, Clerk, Town Hall, Portsmouth .....	" 23
Cardiff—Converting Houses into Shops, Cowbridge-road .....	Corporation .....	John Haslam, Town Clerk, Bury .....	" 23
Portsmouth—Schools, George-street (1,284 places) .....	Leeds Corporation .....	Town Clerk, Leeds .....	" 24
Bury, Lancs—Reconstruction of Turkish Bath .....	Stretford Urban District Council .....	J. Bowden, Architect, 14, Ridgefield-street, Manchester .....	" 24
Upper Wortley, Leeds—Branch Library and Police Station .....	Urban District Council .....	R. and R. E. Horsfall, Architects, 15, George-street, Halifax .....	" 24
Old Trafford—Refuge Destructor .....	School Board .....	H. W. Poole, Clerk, Barnet .....	" 24
Halifax—Additions to Washer-Lane Dyeworks .....	Assembly Rooms Co. .....	G. W. Webb, Architect, Market-place Chambers, Reading .....	" 25
Barnet—Fire-Engine House and Cottage, Tapster-street .....	Corporation .....	Medley Hall, Architect, 29, Northgate, Halifax .....	" 25
Reading—Swansea-road School (390 places) .....	Rev. E. Clarke, B.A. .....	W. E. Clayton-Smith, Secretary, Ropergate, Pontefract .....	" 25
Ovenenden—Pir of Semi-Detached Houses .....	Holborn Board of Guardians .....	G. Sheffield Blakeway, Town Clerk, Guildhall, Gloucester .....	" 25
Featherstone—Assembly Rooms and Market Hall .....	John Walsh .....	Wm. Barker, Architect, 25, Orchard-street, Londonderry .....	" 26
Gloucester—Showrooms at Cattle Market .....		C. E. Vaughan, F.R.I.B.A., 26, Lowther-arcade, W.C. .....	" 27
Strabane—First Presbyterian Church .....		Flockton, Gibbs, & Flockton, Archts., 15, St. James's-row, Sheffield .....	" 27
Mitcham—Laundry, &c., Workhouse .....		W. M. Fawcett, F.S.A., F.R.I.B.A., 1, Silver-street, Cambridge .....	" 27
Sheffield—Drapery Establishment .....			
Fleet, Lincs.—Church Restoration .....			



## BUILDINGS—continued.

Aldford, N.B.—Epidemic Hospital	District Committee	Jas. Duncan and Son, Architects, Turriff	Mar. 27
Epsom—Laundry and Engine-house at Workhouse	Board of Guardians	W. O. Reader, Clerk, Lonsdale House, Epsom	" 30
Newtown, Mont.—County Intermediate School	Governors	H. Teather, Andrew's Buildings, Cardiff	" 31
Sheffield—Baths, Sutherland-road	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield	" 31
Whitfield—Widening Bridge	Northumberland County Council	County Surveyor, Moot Hall, Newcastle-on-Tyne	" 31
West Hartlepool—Post Office	H.M. Commissioners of Works	Hon. Lt. B. Brett, Secretary, 12, Whitehall-place, S.W.	April 2
Grimesthorpe—Roof, Gasworks (360ft. by 700ft.)	Sheffield United Gaslight Co.	Hanbury Thomas, Secretary, Commercial-street, Sheffield	" 3
Pontypridd—School, Llanwood (1,135 places)	School Board	D. Milton Jones, Clerk, Pontypridd	" 3
Ebchester—Seven Houses in Flats, Blackall Mill	School Board	J. Charlton, Pear Tree Farm, Ebchester	"
Dukinfield—Schools (900 places)	T. W. Stansfeld	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	"
Dukinfield—Detached Villa, Old-road		Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	"
Darlington—Stabling, Tubwell-row		C. N. Coates, Stapleton, Darlington	"
Denton, Lancs.—House		J. H. Burton, Surveyor, 2, Guide-lane, Hooley Hill	"
Chelmsford—Wesleyan Chapel and Schools		Gordon, Lowther, and Gunton, Architects, Finsbury House, E.C.	"
Bidford—House		—, Barlow, White Lion Hotel, Bidford, Warwickshire	"
Bradford—Alterations to Warehouse, Vicar-lane		F. Moore, Architect, 10, Sudbridge-road, Bradford	"
Manchester—Fifteen Houses and a Shop, Halliwell-lane, High-town		J. R. Pemberton, 23A, Brazen-nose-street, Manchester	"
Poynton, Stockport—Methodist Free Church		F. W. Dixon, Architect, Trevelyan-buildings, Manchester	"
Streatham Hill—Completing Six Houses		F. H. Harvey, F.S.I., 183, Lavender-hill, S.W.	"
Leeds—Three Through Houses, Cross-gates	Gas Co.	256, Kirkstall-road, Leeds	"
Killamarsh—Retort House and Offices	W. H. Wagstaff, A.M.I.C.E., 57, Saltergate, Chesterfield		"
Holly Hall, Dudley—Two Houses	Thos. Robinson, Architect, Victoria Chambers, Stourbridge		"
Oswaldtwistle—Assembly Room and Shop	Co-operative Society	Haywood and Harrison, Architects, Acreington	"
Oxenhope, Keighley—Store and Sewer Houses	Uppertown Co-operative Society	J. Haggas, Architect, North-street, Keighley	"
Oxenhope—Six Houses, Goose-green		J. Haggas, Architect, North-street, Keighley	"
Poynton, Stockport—Additions to Methodist Free Church		F. W. Dixon, Architect, Trevelyan-buildings, Manchester	"
Rochdale—Friendship Inn, Shodland-road		E. Wood, A.R.I.B.A., 78, Cross-street, Manchester	"
Rochdale—Additions to John-street Tavern	Phoenix Brewery Company	G. A. Hammond, Architect, Rochdale	"
Wrexham—Enlargement, Summerhill Presbyterian Chapel		J. Wrigley, Wrexham	"
Leeds—Demolition of Old Buildings, Excavating and Underpinning	London and Midland Bank	Wm. Bakewell, F.R.I.B.A., 88, Park-square, Leeds	"
Wigan—Congregational Sunday Schools		W. E. V. Crompton, A.R.I.B.A., Moot Hall Chambers, Wigan	"
Sichlinghall—Fever Hospital	Wetherby Rural District Council	T. E. Marshall, Architect, Prince's-street, Harrogate	"
Stourbridge—Brewery	North Worcestershire Breweries Co.	C. Johnson and Sons, Architects, Worcester	"
Shipley—House in Nab-lane		A. Neill, Architect, 16, Cookridge-street, Leeds	"
Rochdale—House in Shaw-street		Norcliffe Mills, Architect, 67, Lord-street, Rochdale	"
Rotherham—Screen and Stalls, Parish Church	Thos. Firth	J. E. Knight, Architect, 20, Moorgate-street, Rotherham	"
Ivegill, Cumberland—Farmhouse at Colt Close	J. W. Nelson	G. Watson and Son, Architects, 3, St. Andrew's-place, Penrith	"
Auchnagatt—Rebuilding Farm Stabling		George Muirhead, Estate Estate Office, Haddo House, Aberdeen	"
Glasgow—Fitting-up Summer Show	Glasgow Agricultural Society	Alex. Russell, Secretary, 175, West-street, Glasgow	"
Cork—Additions to House, Sandy's Well	J. Maynard	Arthur Hill, Architect, 22, George's-street, Cork	"
Eccles—New Chapel		T. D. Lindley, Architect, 150A, Stamford-street, Ashton-under-Lyne	"
Ashton-under-Lyne—Four Cottages		F. Early, Hay Dealer, Ashton-under-Lyne	"
Batley—Additions to Rouse Mill		F. Wild, Architect, Bradford	"
Whitton Gilbert—Three Cottages		S. Falkons, Front-street, Sacriston, Durham	"
Devonport—Structural Works (Three Years)	Royal Engineers	Director of Army Contracts, War Office, Pall Mall, S.W.	"
Exeter—Structural Works (Three Years)	Royal Engineers	Director of Army Contracts, War Office, Pall Mall, S.W.	"
Pembroke Dock—Structural Works (Three Years)	Royal Engineers	Director of Army Contracts, War Office, Pall Mall, S.W.	"
Bridgton, Staffs—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	"
Cannock—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	"
Brierley Hill—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	"
Ulverston—Additions to King's Arms Hotel	R. and P. Hartley	Settle and Farmer, Architects, Ulverston	"
Rochdale—House, Shaw-street	Thos. Firth	Norcliffe Mills, Architect, 67, Lord-street, Rochdale	"
Pudsey—Alterations to Waterloo Inn		John Jackson, M.S.A., Barry-street, Bradford	"
Wigan—Working Room and Houses, Platt Bridge		H. T. Johnson, M.S.A., York Chambers, Wigan	"
Northwood—Re-seating Wesleyan Chapel in Pitch-pine		H. Bovill, Auctioneer, Northwood, Norfolk	"
Burmantoft—Boot Factory, Compton-road	C. Davison	W. M. Coghill, Architect, Beech-grove, Stourton, Leeds	"
Leeds—Four-Story Warehouse, Hunslet-road		W. M. Coghill, Architect, Hunslet, Leeds	"
Hunslet Moor, Leeds—Eight Houses, Arthlington-avenue		J. M. Coghill, Architect, Beech-grove, Stourton	"
Ilkeston—Bakery and Warehouse	Co-operative Society	The Secretary, 12, South-street, Ilkeston	"
Cwmpark—Seventeen Cottages		J. Tallis, Raglan-terrace, Cwmpark, Treorchy	"
Darlington—Scullery, Tubwell-row		C. N. Coates, Stapleton, Darlington	"
Bradford—Additions to Robin Hood Inn		Jas. Jackson, M.S.A., Barry-street, Bradford	"
Bradford—Shop and House, Manningham-lane		Mawson and Hudson, The Exchange, Bradford	"
Batley—Stable Memorial Wing, Technical School		H. B. Backley, Architect, 8, East-parade, Leeds	"
Batley—Villa, Deighton-lane		H. B. Backley, Architect, 8, East-parade, Leeds	"
Anna, near Lisnagry—Creamery	Condensed Milk Co.	J. P. Evans and Co., 131, George-street, Limerick	"
Aiskew, near Bedale—Three Cottages		Robert Imeson, Land Agent, Masham	"
Chester—Two Houses, Hoole-road	Robert Bower, of Chester	Richard Hall, Architect, 251, High-street, Bangor	"

## ENGINEERING.

Cupar, Fife—Filter, Clatto Reservoir	Commissioners	H. Bruce, C.E., County Buildings, Cupar, Fife	Mar. 13
Guernsey—Deepening Harbour, St. Peter's Port	Harbour Committee	J. H. Duquemin, States Engineer, Guernsey	" 13
Torquay—Free Wiring of Houses	Electric Light Committee	F. S. Hex, Town Clerk, Torquay	" 13
Tunbridge Wells—Steam Alternator	Corporation	H. L. P. Boot, Electrical Engineer, Tunbridge Wells	" 13
Borgo and Mozzano Railway	Official	Italian Ministry of Public Works, Rome	" 15
Donhill, N.B.—Rebuilding Bridge (160ft. span)	Dumbarton-road Board	Crouch and Hogg, Engineers, 175, Hope-street, Glasgow	" 15
Walworth—Water Supply to Manor-place Baths by Well Boring	Newington Baths Commissioners	L. J. Dunham, Clerk, Walworth-road, S.E.	" 16
Glengarriff—Sand Quay	Grand Jury, co. Cork	The Secretary, Court House, Cork	" 17
Hook of Holland—Dredging Steamboat Harbour		The Waterstaat, The Hague, Holland	" 17
Ayr—Steel Girder Road Bridge	Commissioners	A. G. Young, Clerk, Council Chambers, Ayr	" 17
Stonesfield—Waterworks	Parish Council	Walter Ivings, Stonesfield	" 18
Belfast—Water Conduit (four miles)	Water Commissioners	R. Hamilton, Secretary, Waterworks Office, Belfast	" 18
Cardiff—Filter Beds, House, &c.	Corporation	J. L. Wheatley, Town Clerk, Cardiff	" 19
Cambus and Carsbridge Water Supply	Clackmannan County Council	J. W. Moir, County Clerk, Bank-street, Allon	" 23
Lesbury, Alnwick—Lattice-Girder Footbridge	Alnwick Rural District Council	W. H. Walton, Clerk, Alnwick	" 23
Huelva—Dredging the Padre Santo Channel	Spanish Government	Public Works Department, Madrid	" 20
Swansea—Double Line between Swansea and Port Tennant (1 mile 8 chains)	Rhondda and Swansea Bay Rly. Co.	H. S. Ludlow, Secretary, 8, Fisher-street, Swansea	" 20
Burnley—Filters and Service Reservoir, Cart Clough	Corporation	G. H. Hill and Sons, Engineers, Albert-square, Manchester	" 22
Arklow—Overhanging Footway to Bridge	Grand Jury of Wicklow	E. N. Wynne, Secretary, Court House, Wicklow	" 22
Belfast—Steam Crane (three tons lift)	Harbour Commissioners	W. A. Currie, Secretary, Harbour Office, Belfast	" 22
Guildford—Turbine Plant at the Mill	Corporation	Town Clerk, Guildford	" 23
Holloway—Electrical Generating Set	Islington Vestry	Electrical Engineer, 50, Eden Grove, Holloway	" 23
South Shields—Electrical Lighting Plant	Corporation	J. Moore Haydon, Town Clerk, South Shields	" 23
Wakefield—Two Boilers, Workhouse Infirmary	Board of Guardians	H. Beaumont, Clerk, 47, Kirkgate, Wakefield	" 25
Plymouth—Electric Lighting Plant	Corporation	J. H. Ellis, Town Clerk, Plymouth	" 26
Lincoln—Hot-Water Supply, County Hospital	Governors	W. Watkins, Surveyor, Silver-street, Lincoln	" 27
Wells, Somerset—Electric Lighting Plant	City Corporation	R. L. Foster, City Clerk, Wells	" 27
Braila, Roumania—Electric Street Tramways (13 miles)		The Mayor of Braila, Roumania	" 29
Burnham-on-Crouch—Water Mains (690 yards)	Maldon Rural District Council	N. G. Keywood, Surveyor, Maldon	" 31
Frankley—Railway (1½ miles), Reservoir (200,000,000 gallons), 18 Filter-Beds, &c.	Birmingham Corporation	E. Orford Smith, Town Clerk, Birmingham	" 31
Ostend—Harbour Extension	Provincial Administrator	17, Rue des Augustins, Brussels	April 13
Ostend—New Harbour	Belgian Government	The Commercial Museum, Brussels	" 17
Brazil, St. Paulo—Lighting City by Gas	Municipality	Department of Agriculture, S. Paulo, Brazil	" 21
Wilmslow—Laying Gas Main	Gas Company	Wm. Severs, Engineer, Wilmslow, Manchester	"
Glasgow—Electric Light Plant, at Olympia		Lithgow and Son, 76, West Howard-street, Glasgow	"
Barnsley—Well at Oakwell Brewery		Secretary, Barnsley Breweries Co.	"
Baldock—Overshot Waterwheel		John Randall, Stotfold Mills, Baldock	"

## FENCING AND WALLS.

Camteck—Post and Rail Fence (96 yards)	Carlisle Rural Sanitary Authority	The Clerk, 25, Lowther-street, Carlisle	Mar. 13
Dewsbury—Dry Fence Wall, Halifax-road	Corporation	G. T. Lee, Town Clerk, Dewsbury	" 15
Lancaster—Wall and Iron Fence, East road	Grammar School Governors	W. C. Roper, Clerk, Bank Buildings, Lancaster	" 15
Barking, E.—Wrought-Iron Fencing (700 yards) Longbridge-road Recreation Ground	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking	" 16
Oswestry—Stone Wall, Roft-street	Corporation	R. O. Wynne-Roberts, Borough Surveyor, Oswestry	" 17
Goldcliff, Mon.—Sea Wall	H.M. Commissioners of Sewers	W. S. Gustard, Clerk, Newport, Mon.	" 20
Cardiff—Iron Fencing at Reservoirs (580 yards, 6ft. 6in. high)	Corporation	J. L. Wheatley, Town Clerk, Cardiff	" 25
Gloicester—Walls and Palisading, Bull Ring	Corporation	G. Sheffield Blakeway, Town Clerk, Guildhall, Gloucester	" 25
Woodale, Redcar—Dry Stone Walling (500 roads)		Jas. Rutherford, Kirkcatham, Redcar	"



## THE BUILDING NEWS

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FRIDAY, MARCH 19, 1897.

THE ARCHITECTURAL CRAFTS—  
OLD AND NEW.

HOW great has been the change in the spirit and aim of art as seen in our buildings and trades during the last thirty years or more! We can only estimate the revolution that has taken place by comparing the designs of buildings and furniture made at that period and those of to-day, and by examining technical results in exhibitions of trade. Take Gothic work as an example of this. The ideas have completely changed. The motive of the designer in the "sixties" is so different to that which now rules our leading architects that it is almost impossible to believe what we see. What we called Gothic then was a totally different thing—a puerile and feeble use of features we hardly knew how to employ. We may take two churches designed by the same architect, one built about 1860, the other two or three years ago. The first has a plan of the ordinary nave-and-aisle type, with chancel narrow and lower than the nave. There is the "regulation" tower and spire of broached construction, windows of Decorated tracery, buttresses of the ornamental kind, in which the attempt has been made to produce a certain kind of richness and Gothickesque feeling. There is nothing glaring or decidedly wrong; the "style" of Parker's "Glossary" has been carefully followed in every feature and moulding. Inside we see the ecclesiastical furniture. Patterns then in vogue are used in the design of bench-ends, in the stop-chamfered open-timber roof; in the font, the Communion rail, with the stiff-leaved or folial hammered-work at the standards; while the prayer-desk and pulpit are just of the kind which a ladies' amateur carving-class might have turned out. As for the little attempt at decoration in the chancel, in which colour of crude tones in bands or in diapered surfaces prevails, we can only compare it to an inferior decorator's work. But the architecture and the fittings are what we mainly refer to here. Let us now pass to the later building. In motive and design it is entirely different; we can hardly believe the same architect designed both—one so correct and precise and pleasing to the popular taste. This is severe, on its lines; even the plan is simpler. One continuous ridge runs from the western to the eastern gable; there is perhaps only one aisle, perhaps only the chancel and a bit of the nave finished; no spire, but an unfinished tower, plain and bare, pronounced ugly by most people; all is of red brick, without the relief of stone tracery and buttress weatherings or pinnacles. The whole conception of what a church should be is altered. Little by little we begin to see the reason of this radical change. The money is expended on doing one part well and leaving others plain. This explains the unfinished plan and barn-like simplicity of the building. When we begin to take each part of the plan, we find the architect has paid a more thoughtful attention to requirements: there is the large ritual chancel, in which the detail is more lavish, and, if anything, more finished. Instead of a number of single aisle windows filled with Decorated tracery, we see a few plain lancet windows, perhaps; while over it is a deep clerestory of larger windows, admitting light where it is not obstructed and can only be got in a town church. The buttresses are few, of plain brickwork, intended simply to give solidity where most needed, all in

compliance with the principle that it is better to build well and solidly a small part at a time, and to increase the building as the locality grows. Inside, also, how very plain and severe and crude the seats!—mere chairs, and a boarded waggon-shaped roof. Looking more carefully at the details of the woodwork, what do we find? In the earlier Gothic building stop-chamfers and mouldings predominate—they are everywhere; the moulded bench-ends or cappings to the seats, the pulpit cornice and base—they are indeed the be-all and end-all of the joiner's art. Not so in our later example, where we find a general avoidance of both these "finishes," which give to them a rather strange, hard, and severe look. Let anyone compare, for example, one of the town churches built during the early years of the Gothic Revival, and such a church as that we illustrated last week, St. Anselm's Church, Davies-street, Mayfair, by Messrs. Balfour and Turner. The contrast is almost startling—one is fussy, and full of detail of a kind illustrated in glossaries, enriched features, traceried windows, bosses, and crockets, and other carvings; the other is extremely plain, almost bare outside. Though Gothic in conception and spirit, it is not so in detail. There are no pointed arches: these have circular heads filled with plain Late tracery; buttresses are conspicuously absent, and are replaced by wide projecting piers acting as counterforts to the nave roof. There is no external carving; all is exceedingly plain; no copings to the gables, but simple tile roofs covering the walls, yet withal thoroughly adapted to our climate, especially that of a London atmosphere charged with smoke, which so soon destroys all carved work. All is brick, plastered internally and trowelled only. The floor is carried by steel joists, and rafters are replaced by pitch-pine boards. The dado round the interior is of glass tiles, Irish green marble being used in the chancel. The west end externally is bare, and no attempt has been made to pierce the end by a large window, only an arcade of "blind" arches being introduced. Here we have a typical example. No doubt many will exclaim "How bare! how ugly!" But the architect of to-day is beginning to learn that there is more opportunity for honest, thorough art if the designer is content to curtail his exterior and devote his efforts to interior decoration. The Bishop of Stepney, at the annual dinner of the Society of Architects, made an apt remark when he said that architects devoted too much labour and expense to the exterior of churches, and he advised them to follow the example of Italian churches—notably that of Ravenna, where plain brick buildings were filled with the richest mosaics and paintings.

But to turn again to the craft of joinery. Why is the change from elaborate to simple finishes, which we have been discussing? And here we come to the main question we have set before us to consider in this article. The average joiner himself would probably hardly know. He may think moulded cappings, mitres, chamfers, and the like improve the appearance; but this idea is no longer held by the advanced leaders of art joinery. Mr. Lethaby has shown by his designs, and also by his remarks on woodwork, that mouldings are not decorations, and he has said, the sooner we get rid of them the better. There is much truth in the remark, and, as another speaker on the subject has lately pointed out—Mr. E. B. S. Shepherd, at the Art Students' Guild—the joiner looks to his dentils or bead-and-reel ornaments when he wants to be artistic; but these are only "rags and tatters" of an earlier art, and as such should be repudiated as trade notions of decoration. The tenor of his remarks was: Let the workman find an outlet for his individuality, if he will, in the direction of imitating nature. Let him do his work well in every respect, for that is art, though, it may be, in a restricted sense.

Let him dress his stuff to set off the "figure" of the wood, make his doors and windows fit, drive nails that they shall not split the wood, and so on. By so doing he is exercising his art far more commendably than in sticking on mouldings, notching and decorating his work with ogees, beads, and ovolos that are added to the finished work. He may indulge in simple ornament, like that of moulding the edge of a table or a bench-end out of the solid stuff, or of incising on the flat surfaces of standards or panels appropriate ornament; but the main source or outlet for his art is to put thought into the work he has to do, by designing and framing it to give the best results without in the least doing anything to contravene the properties of the materials by sticking on ornament or destroying the nature of the wood by carving.

And the same principle applies to all other arts. If we take the bricklayer and the mason, we find that a great revolution has been made. Thirty years ago we saw an attempt to ornament brickwork by various devices borrowed from Venice and other Italian cities; but lately the vernacular English style, especially that of the 16th and 17th centuries, has introduced a plainer and more honest art. Instead of parti-coloured work, bands, and ornamental cornices and voussoirs, the tendency has been to revert to old English models, and the technical schools and classes have introduced "gauged" work as a more honest kind of brick ornamentation. The design of stonework has undergone a great change. During the Classic revival stone was treated in smooth dressed surfaces; subsequently, the Italian revival brought with it a more elaborate and florid kind of stone cutting and ornament quite unsuited to our great cities. Architrave mouldings, pedimental dressings, elaborate cornices, keystones, festoons, sculptured capitals and friezes, led masons and architects to disregard the restrictions of climate and material. Decorative sculpture and features were carved in soft freestone, which were only intended for marble and the Italian atmosphere. Rapid decay, blackened façades, and costly repair soon did their work. The Gothickist employed detail exuberantly. Carved bosses, crocketed pinnacles, and other ornament were cut in the softest of oolitic stone. It has been left for the modern mason to discard these modes of treatment, and to employ stone in a much more limited manner, to avoid elaborate carving—at least in the exterior of buildings. The principle now recognised by the best designers is to reduce projecting members, like elaborate cornices, to avoid deeply-cut sculpture and relief on the outside of buildings, and to keep the stone as flat as possible, and no doubt the use of terracotta has largely contributed to this end. In plasterer's work we find a similar restriction of material has taken place. The plaster casts, at one time seen on buildings and on ceilings, centre-flowers, swags, and other enrichments, are no longer seen in good work, but are used only by the jerry builder. Low relief has taken the place of heavy ornament. The lead and iron worker have both come under the influence of art, though not perhaps to the same extent. The way of treating such things as rainwater heads, cisterns, and spouts, finials, and the like is no longer under the sway of plumbers' notions. The art craftsman in lead knows that he can make these things of better shape than the ordinary plumber has been used to give them, and ornament them by methods more in keeping with the material. As for ironwork design, the improvement has been rapid. We see few of the over-elaborate cast-iron crests and obtrusive finials once so common, or the effusive ornamental castings for spandrels, balustrades, and other things which at one time filled the illustrated



pages of the ironfounder's catalogue. And why is all this? Is it not because we have begun to see that art is another name for well-directed craft; that it has nothing to do with mere fancy or ornament, apart from the workmanship and material? It will be some time before the public, or even the ordinary workman, will begin to appreciate the newer mode of craftsmanship, for it requires frequent iteration in doing a thing in a new way before the change appeals to them.

#### ROYAL INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE usual standard of merit in this exhibition is hardly maintained, though any shortcoming in the number of new pictures is compensated for by the collection of works by distinguished modern water-colour painters now brought together in the West Gallery, which constitute the Royal Art Union prizes. In the Central Gallery, which is now the first gallery devoted to the annual exhibition, we find a few pictures of interest. Frank Dadd's work is full of quaint humour. Human interest or sympathy is a quality to be found in all he does, and this attribute is seen in his picture, "Who's There?" an elderly man with an old-fashioned muzzle-loading pistol, which he has just cocked, timidly standing at the door of a room before he unbolts the lock. The flickering candle on the floor sends its gleams of light over the figure and terror-stricken face of the occupant, and imparts a weird and dramatic interest to the scene. Mr. Dadd's other subject (146), "The Squire's Portrait," is painted with his usual care and finish. The fireplace and panelling in polished oak are correct in style of the last century, and careful in detail. Through the large mulioned window the light streams in, illuminating the faces and accessories of the room. A little boy, attentively watched by a young lady on a couch, is trying to sketch the portrait of the squire, dressed in a riding habit. Behind the couch a gentleman stands with pipe in hand, watching the youthful performance, while the expression of the squire's face is rather that of indifference, if not disdain, as if he were not a willing party. Nice colour and atmosphere distinguish F. Stuart Richardson's "Bristol City," sketchy and vigorous, the painter has shown much feeling and spirited execution. George Wetherbee's "Autumn" has a charming poetic simplicity and motive—a woman on the skirts of a wood, carrying a bundle of sticks. Harry E. James sends a pleasing study of a little girl in a blue frock standing at a cottage-door. Strong in colour, and vigorous is the Scotch landscapist, R. B. Nisbett, "A Dark Moorland" (13), is bleak, but powerful; a clever sketch, "Autumn" (79); and "Stonehaven" (116), a firm and masterly sketch of this picturesque little coast-village taken high up the hill with the blue sea beyond, show a breadth and precision of touch, and charm of grey colour. Edward H. Fahey sends a close study of nature in his "Bramston Burrows" (16); hillocks of sand, with sea in the distance, and other subjects, in his usual careful manner. A little bit of impressionism strikes us in Moffat Lindner's "View of Christchurch" (20), a slight sketch of the Hampshire town, in which the light and brightness is suggested by the simple and precise handling of colour. A large picture crowded with figures is by W. B. Wollens (38); a march through a country village, illustrative of some verse by Rudyard Kipling—

"The drums begin to roll, my boys; the drums begin to roll."

The villagers are all turned out, the coach and four drawn up at the old inn to see the "red line of heroes." Chiefly as a piece of careful drawing and colour has it any

claims. Miss Alice Hobson shows very minute finish in "Keywood Farm, Sussex" (22). Strong and clever is Frank Rousse's "Fish Quay, Whitby" (33), with its blue water and reflection on the rippled surface; and near it Hugh Carter has a careful drawing of Haddon Hall, with its well-known bay windows, and Charles J. Adams a "Highland Cattle Fair" (37), in his spirited manner. Much fine colour and vigour are shown by T. Marjoribanks Hay, "On the Berwickshire Coast" (40), passing which is a masterly sketch of "The Forum Romanum, Rome," by Count Seckendorff (44), and a landscape by George Cockram, "The Time of Harvest" (45), full of sunny warmth over the harvest field. Albert Kingsley, in his view "Off Flamboro' Head" (46), and his "Bit of the Hampshire Coast" (87), is fresh and strong in colour. Yeend King's work often suffers from intensity of its cold green, and his view of "Dovedale," in the East Gallery (288) justifies this indictment; but "Tankerness House, Kirkwall, Orkney," is a charming bit of bright colour, a garden sketch, so is "A Berkshire Cottage" (130). There is a spring freshness about them. Amongst the figure subjects, the president Sir James Linton work must be noticed. He sends three subjects: "Wallflowers," the study of a fair-haired young lady in a drab-toned costume, carrying a vase of the flowers, admirable in its delicate tones and textures. His "Shylock and Jessica" (165) is the most satisfactory work. The old Jew is painted with skill, but rather heavy; Jessica has an expression of slyness that suits the dramatic character of the subject, and the textures of her elaborate dress, and scheme of colouring are of high finish and beauty. But we cannot see much to admire in the full-length "Rosalind," in the East Gallery. It is wooden and flat, though there is much delicate painting in the dress, a doublet of green damask, with top-boots. She is represented disguised as a country lad, Orlando's mistress. "La Penseroso" (62), a delicately-painted golden-haired maiden in white robe, by Henry Ryland, is rather feeble. Henry M. Rheam's version of "La Belle Dame sans Merci" scarcely does justice to the legend. Better figure studies are Edgar Bundy's "Waiting for an Inspiration" (109), an old bookworm bending over a table laden with books and china, his head wrapped in a towel, and J. C. Dollman's large interior "Dogma" (175)—two elderly clerics of opposite schools hotly discussing over a table while two easy-going country gentlemen are forced to listen to their argument, is amusing. One little incident is the cat, which is making the best of the opportunity under the table. The room and costumes are of the last century; the light from a window with scarlet blind illumines the faces of the party. Other subject pictures worth mention in this gallery is G. Sheridan Knowles's "Confidences," two lady gossips (204); Gordon Browne's spirited duel scene, "The Traitor" (210), clever and dramatic in action C. Green's "Fish-Girl" (162) is a delightful piece of *genre*—an old Tudor archway with its rich panelled gate; one of the figures introduced is a fish-girl. A sense of quietness and seclusion is given to the scene, and the finish is exquisite, as that of the clematis growing on the wall. "The Miniature" (153)—a young lady, seated, looking at a cameo which she has taken from an escritoire or cabinet, is also extremely delicate in handling. Henry G. Tukey sends a clever sketch of an "Old Steersman" (54).

Other landscapes, such as E. M. Wimperis's "High Down, Dartmoor," with its grand sweep of swelling moorland and light and shadow, and other works from the same locality in the East Gallery, 231, 239, deserve notice for their breadth and atmosphere. John White's "Village Street, Branscombe" (157), with its nestling church; Claude Hayes's "Stacking Osiers" (151), firm in its

handling; Harry Stick's "Bradley Mill" (156); Frank Walton's Cornish studies are among the number of lesser works. Claude Hayes's large subject, "Old White Mill" (208), is fresh and strong. John Fulleylove's "Fountain Court, Trinity College, Cambridge," is a bright and charming drawing, and we must note Fred G. Cotman's clever and bright "Beccles Town" (218), Tom Clough's "Corner of Village," Hugh Carter's "Tired Out," and Prof. Hans von Bartel's forcible "Dutch Interior," an old woman seated close to a large old-fashioned fireplace (119), strong in colour.

The East Gallery has a few pictures to notice. "A Moorland Rivulet, Derbyshire" (222), is admirable in atmosphere, breadth, and gradation. R. Davies's study of a shady path through trees, brightened by gleams of sunlight (224), is fresh. G. G. Kilburn disappoints by his hard and feeble scene on the terrace of a country residence, "Auntie" (226). "The Lady June" (353) is a more successful work—the face and bust of a comely woman in an open white brocaded bodice. A strong and pathetic work is Miss Anna Nordgren's "Swedish Interior" (229), in which that lady painter reiterates her power of depicting the deprivations of humble peasant life. In a scantily-furnished dark room sits a poor wan-faced girl partaking of her frugal meal of porridge. The light which struggles into the room and the dark shadows are telling, and add to the pathos of the conception. C. MacIver Grierson, in "Reflections" (233), has a graceful study of a lady arranging a rose in her hair; and Miss Mary Winifride Freeman, in her picture of "The Princess and the Wild Swans," gives us a quaint conception not devoid of sentiment. The broadly-handled and fresh landscape, with purple heather and heavy rain-clouds, by Claude Hayes (230 and 235); Frank Walton's Cornish subjects (237 and 238), E. M. Wimperis's landscapes (223, 239, and 244) are all excellent in atmosphere and colour. There is some faint inspiration in "St. Genevieve," by T. Austen Brown, whose work is solidly and strongly painted; but the little maiden saint, who is leading her sheep through a dark woodland way, scarcely does justice to the legend. Harry Hine is exceedingly light and delicate in his "Fen Land" (248), a slight impression of early spring. The large work, "O'er Moor and Fell," is smoothly painted, the soft velvety hillside, lit up by a warm afternoon sun, very realistic, but Mr. Joseph Knight is falling into a vapid-mannered style. We cannot say Miss Marian Chase's flower studies (258) are equal to her usual work. There is a crude hardness in the colour, despite careful drawing. Broad and vigorous is A. J. Collister's "Hedge-row" (267). A. W. Weedon's "Firth of Tay" is a clever study of reflection on rippled water (279), and we must not pass over Thos. Huson's "The Last Furrow," a clever piece of landscape perspective, strong in colour. Other landscapes to notice are Bernard Evans' autumnal view of "Fountains Abbey" (327), in which the masses of the foliage are bathed in a warm sunlight; Jas. Orrock's Constable-like landscape (393), T. Hope McLachlan's "At the Fold" (420), R. Davies' vigorous view of "Arthog, North Wales," A. Weedon's "Hayfield" (373), and works by Edwin Hayes (343), R. B. Nisbet (339), William Tyndale (332), H. Caffieri (397 and 413).

One of the most interesting figure subjects in this gallery is H. B. Steer's "Nicholas Nickleby Interposes in Smike's Behalf" (283), in which the incident of Dottheboys Hall is recorded. The figures of old Squeers and his wife are full of character. Very pretty and natural is William Rainey's work "A King of Roses," and we may refer to "Human Eyes," Edward Henry Corbould (299); Henry J. Stock's "Two Lovers after Death" (312), an imaginative conception we can hardly place in the rank of decided successes.



Arthur Burrington's "La Vida es Sueño" (368), a couple of lovers—one a Spanish gallant with a guitar, sitting next a brunette, who is smiling with winsome features while listening to the melody—is skilful; and so is his other *genre* subject (338). W. W. Collin's "Come Unto Me, Ye Weary" (364); G. Sheridan Knowles's "Sylvia," a pleasing study of a girl's head, and studies by Miss G. Demain Hammond are other works of interest.

The West Gallery, set apart for the prize works to be drawn for in connection with the Institute Art Union, contains many well-known pictures. Amongst these we can only mention a few charming and characteristic drawings by S. Prout, in his bright sepia outline and wash style, some very delightful sketches by Jas. Holland; "Batalha" (24), and a street scene in Normandy (35), in which the delicacy of detail and broad shadows in simple washes are very effective. P. Dewint is represented in several broadly-treated subjects (18, 19, 25, and 34). The style of J. Varley is shown in his view of Conway Castle, with its mannered foliage; and one or two fine examples of George Barret may be named, especially an Italian landscape (54). Drawings by W. Muller, R. P. Bonington, J. S. Cotman, and two exquisite sketches in his earlier style by Turner (13 and 26) must be noticed; also two subjects, or, rather, "Notes," by John Ruskin (30 and 32), both admirable impressions of colour. These early works have an historical value to students of water-colour painting, as illustrating the methods used, the reed-pen outlines, and sepia and grey washes of colour which ushered in the more advanced and freer handling. Many other important works by leading painters are to be seen in these artistic treasures, which are to be drawn for by subscribers.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE tenth ordinary meeting for the present session of the Institute was held on Monday evening, when Mr. Aston Webb, vice-president, occupied the chair.

#### HERALDRY IN ENGLISH MEDIEVAL ARCHITECTURE.

A paper on this subject, illustrated by a large number of photographs thrown on the screen by the oxy-hydrogen lantern, and by a series of large coloured photos. of the armorial stall-plates of the Knights of the Order of the Garter in St. George's Chapel, Windsor, was read by Mr. W. H. St. John Hope, M.S.A., F.S.A. The author confined his attention to the historical period beginning with the accession of Henry III. in 1216, and ending with the death of Henry VIII. in 1547. The applications of heraldry to architecture in this period were so numerous that it was not easy to deal with them in any degree of connection. Arms, badges, crests, and supporters were freely used in every conceivable way, and on every reasonable place. Whether the building were ecclesiastical, domestic, or secular was immaterial; there was no difference in the treatment of the heraldry nor limitation of its use. The earliest applications of armorial insignia were purely of a personal character, to distinguish a man from his fellows when all were alike disguised in their war harness. These insignia usually took the form of a device painted upon the wearer's shield or attached to his head-piece. Heraldry, consequently, is met with first in buildings in the form of painted or sculptured shields on the monumental effigies of departed warriors. The value of armorial shields as a mode of picture-writing soon suggested itself when heraldry became a science, and the association of them with architecture formed at once a beautiful form of decoration and a speaking historical record. The wall arcades of the nave aisles, and the tombs of Queen Eleanor and William de Valence, in the Abbey Church of Westminster, furnish the earliest and most charming examples of this combination. Another admirable 13th-century example is the gatehouse of Kirkham Priory, Yorkshire. In the new nave of York Minster, of about the same period, various benefactors to the Church are commemorated, after the West-

minster fashion, by their shields of arms, thirty-two in all, sculptured, two to a bay, in the spandrels of the pier arches. A somewhat similar arrangement occurs at St. Alban's in the beautiful Decorated bays of the nave, built after the partial fall of the south aisle in 1323. In the North of England there were numerous 14th-century buildings showing heraldic decoration with the architecture—for instance, Bothal Castle, Alnwick Castle, Hilton Castle, Co. Durham, Lumley Castle, the Lion Tower at Warkworth, and Micklegate Bar, York. The presbytery and choir of York Minster contain in the spandrels of the pier arches a series of sculptured shields similar to those in the nave, and the great arches of the central lantern tower are also adorned with large and fine examples of the sculptured shields of arms of the builders and others. Taken as a whole, the 14th century, except perhaps in Yorkshire, was not very prolific in buildings decorated with heraldry; but it produced a magnificent series of monuments, many of so elaborate a character as to form distinct features of the churches wherein they stand. The more notable examples were enumerated and illustrated by the author of the paper. The so-called Perpendicular style was very prolific in heraldic ornament and decoration, which was especially seen in East Anglia, where almost every large church of the period is lavishly decorated with heraldry. Notable examples were Norwich Cathedral, and the Bishop's and Erpingham Gates, leading to the Close of that city, and Cley and Lavenham churches. Fine displays of heraldry existed in many of the ornate fireplaces of the 15th century, notably at Tattershall, in Lincolnshire, and the bishop's palace at Exeter. The 15th century, like the 14th, was rich in heraldic monuments, and brought into fashion those beautiful stone structures that combine the monument with the chantry chapel, of which examples exist at Tewkesbury, St. Alban's, Salisbury, Winchester, and elsewhere; one of the finest in design, as it is most remarkable in construction, being the bridge-like structure in Westminster Abbey Church, in memory of Henry V., whose tomb stands beneath it. Much of the architectural heraldry of the first part of the 16th century is simply a continuation of that which preceded it. In large and costly buildings, however, the increased richness of the architecture was accompanied by a corresponding outburst of heraldic display, as in Henry VII.'s Chapel at Westminster (in particular the bronze doors); King's College Chapel, Cambridge; St. George's Chapel, Windsor; and Hampton Court. Selecting a few typical architectural features, such as spandrels, bosses of vaults, &c., Mr. Hope proceeded to show the influence the introduction of heraldry had had upon their ultimate development, citing numerous existing examples. In conclusion, the author discussed, by the light of Mediæval examples, the artistic treatment of heraldry in its application to architecture—shields, crests, supporters, and various other features being dealt with in detail.

Mr. J. ALFRED GOTCH, F.S.A., proposed a vote of thanks to the lecturer, remarking that although the nearer they approached to the fountain head the fiercer the heraldic strain must be, yet, personally, he was more interested in the later developments of the art, where the designers displayed a freedom, a cleverness, and ingenuity in treating the devices which excited our admiration. The work in Henry VII.'s Chapel at Westminster was a splendid example of heraldic treatment; but if he might venture to criticise its treatment, he would suggest that the badges were out of scale with the shields. In Mediæval work there was a freedom in the form of shield and in the drawing of the charges which was absent from modern reproductions. As the author had shown, heraldry soon changed from a personal to an hereditary possession, and when its decorative qualities were manifest ladies soon availed themselves of the right to bear arms, usually adopting the lozenge form. Mr. Hope had not noticed that in Spain ladies used twin shields, one for themselves, and a second one charged with their husband's arms. Unmarried ladies kept the second shield blank, in reserve for their future husbands, and these were known as Arms of Expectancy, and it could be imagined that ladies looked forward with some degree of pleasure to the arms of their husbands. Even in Mediæval times shields were often charged with initials and letters.

Mr. J. J. STEVENSON, in seconding the vote of thanks, remarked that heraldry, so far from being originated in the 13th century, was as old

as the human race, and was but another form of totem worship or of merchandise marks. He often had tried to persuade clients to put their family arms on the entrance gates or mantelpieces, and never could understand the objection to using them where people had a right to them. He did not see why a crest should not be used without a helmet, as men nowadays did not wear a helmet, but a top hat. The original crests, such as the leopard on the tomb of the Black Prince in Canterbury Cathedral, must have been very heavy, and it was difficult to see how they were retained in position on a helmet. At Christ College, Cambridge, when some repairs were being made to the master's house under his direction, he suggested that if the chimney-piece were removed possibly traces of the original one might be found. This was done, and the old chimneypiece was found in a perfect condition, still carved with designs of marguerites, a play on the name of the founder, Queen Margaret, and her monogram.

Mr. HUGH STANNUS said the helm was a valuable feature artistically in arms, as any boss gave life to the flat surface beneath. Heraldry was one branch of the great subject of storiation, and was often, when applied to a building, the only means afforded us of learning the names and dates of those who reared it. It was first personal when a man changed his device as often as he liked, but afterwards descended to the family, when it obviously became desirable to differentiate between branches, and to protect its members from the assumption of their device by unauthorised persons. When used as decoration it must be subordinate to the principles which governed architecture. There must be some sense of support or suspense for the shield, and as a diapered surface was a tone lower than a plain field, it should be treated as a matter of relief rather than of colour. As to the crest and helmet, the whole thing was merely a conventional way of stating a fact, and if the arms might be put on a shield, there could be no objection to putting a crest on a helmet. He believed Mr. John Crace, Mr. T. R. Smith, and a few other modern designers had produced heraldic devices quite as fine as those of earlier times, although it was, of course, from Mediæval examples that they had to take their key-note.

Mr. JOHN D. CRACE observed that the examples shown on the screen by the lecturer exhibited a thorough knowledge of the principles of heraldry and of the significance of the insignia. The Mediæval workers showed great freedom in their designs; but this freedom was a very dangerous thing to adopt by those who had not gone through the mill and thoroughly mastered the art. A very fine example of modern heraldry to which no allusion had been made was Pugin's work in the House of Lords.

Mr. HOPE briefly replied to the vote of thanks, remarking that neither Spanish heraldry nor that of modern times had come within the scope of his paper. The heraldry of Spain, like that of Germany, was often carried to extravagant lengths. The heraldic work in the Houses of Parliament was magnificent; but Pugin was steeped in Mediæval lore. The leopard crest of Edward the Black Prince was made, like most crests, of leather, and only weighed a few ounces.

#### THEATRE ARCHITECTURE IN SYDNEY.

##### THE NEW PALACE THEATRE OF VARIETIES.

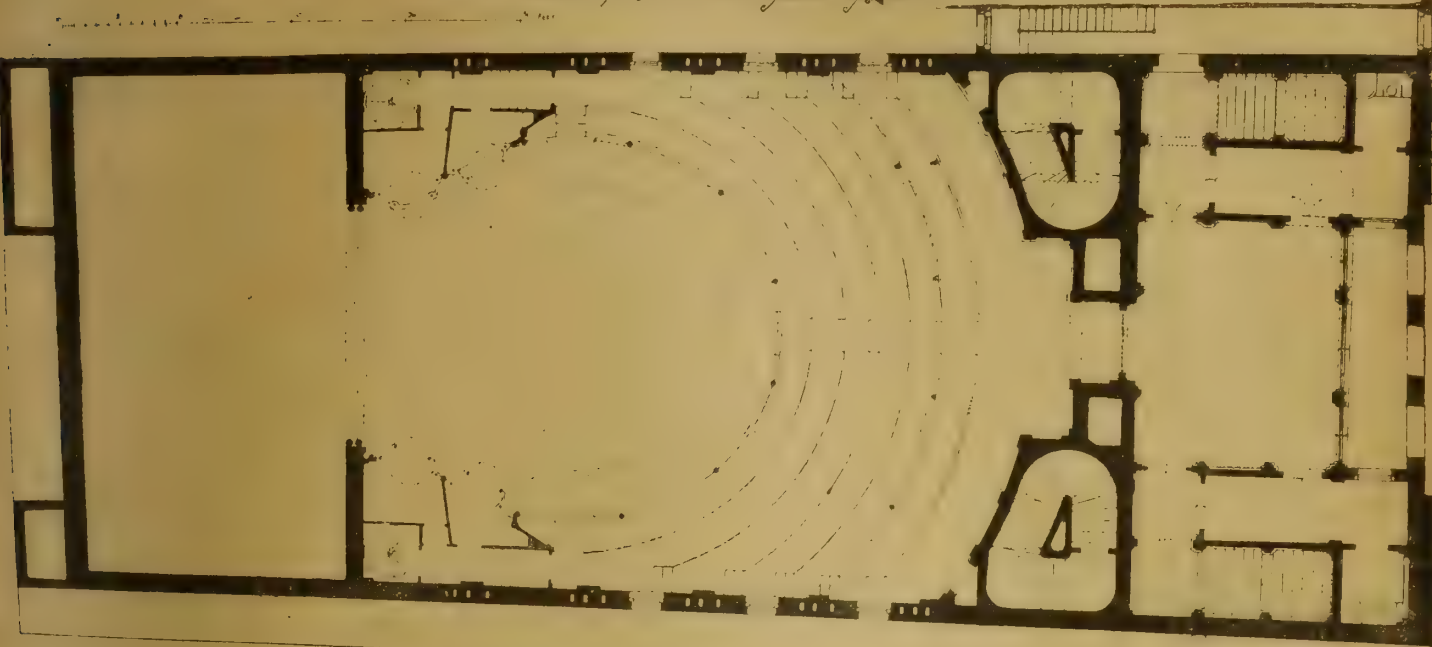
UP to last Christmas, when the new Palace Theatre of Varieties was opened, Sydney possessed only two theatres really worthy of a great city—viz., Her Majesty's, a large and handsome house nine years old, with a magnificent stage 84ft. wide, 50ft. deep, and 100ft. in total height and depth—a theatre capable of producing the most elaborate spectacles, and usually tenanted by Mr. George Rignold (the "Augustus Druriolanus" of Australia); and the pretty little *bonbonnière*, the Criterion, remodelled some time since by the architect of the theatre now under notice, Mr. R. Clarence Backhouse, F.I.A., N.S.W., usually devoted to high comedy, and the Sydney home of Messrs. Brough and Boucault. Of the older theatres, the interior of the Theatre Royal was a few years ago gutted by fire—to the surprise of nobody who knew anything about its construction—and was run up again in a way that would not be tolerated for a moment in any city possessed of either a proper Building Act or an efficient licensing authority for theatres; the Opera House was considered by Lord Carrington, when







Palace Theatre Varieties Pitt St Sydney  
 GEORGE ADAMS ESQUIRE



### First Floor Plan

ornamental ellipse containing floating figures amidst clouds, representing Music, Poetry, and other arts. At the corners of the rectangle are circular panels with flower-strewing *amorati* on light-blue grounds, while the complemental divisions at the angles are filled with richly-coloured arabesques upon gold grounds. The floor is laid with Maw's interlocking mosaic in Venetian red, with black and buff borders and pateræ, and on either side of the great archway are handsome and artistic ticket offices, architecturally treated in red cedar.

The general treatment of the vestibule is continued upon the twin arched stairways with their massive nickel handrails, by which, on the first floor, is reached the *foyer*, 21ft. by 18ft., and 15ft. high. Here each wall-face is arched with three bays, divided by pedestalled dwarf pilasters. The arches facing the street are occupied by handsomely moulded cedar folding doors, the panels and fanlights glazed with richly-treated Cinquecento glass, which give upon the tiled and open loggia already mentioned, and intended for indulgence in the "fragrant weed" between the acts (though, to the chronic indignation of managers and of many theatre-goers, the Licensing Act of New South Wales forbids the sale in theatres or music-halls of anything stronger than tea or soda-water with which to moisten the cigarette; otherwise the *foyer* would, of course, have been fitted with a bar). Directly opposite, similar but more spacious double doors admit to the dress circle. At the ends of the room the furthest arches form the embouchure of the stairways, while the nearest ones lead to the cloak and retiring rooms on either side for ladies and gentlemen respectively, with separate approaches from the staircase landings, all mosaic and marble floored, and sumptuously decorated and fitted up with carved cedar and stained glass. The intervening spaces in the *foyer* contain bevelled mirrors let into the wall, while the remaining side-panels and such of the tympana as are not occupied by fanlights are decorated in the same style as the tympana of the vestibule. The decorative treatment generally is much the same as that of the vestibule, only more delicate in colour. The ceiling panels, however, are differently arranged. The central division is a pure ellipse, and contains an allegorical group of figures on the clouded heights of Olympia, typifying Inspiration and Composition. Interlaced with this are four circles with gold grounds displaying musical instruments, while the large angel panels are devoted to *amorati* sailing amidst clouds. The electric lighting is by brackets placed over each

of the solidly gilt pilaster caps, while the floor is laid with a patent Axminster carpet of rich Persian design.

We now come to the auditorium itself; but before describing the appearance and construction of this unique and striking *salle*, its dimensions and accommodation may be given. The extreme size of the area so occupied has already been mentioned as 50ft. in width and 64ft. in depth. Of this 64ft., just one-half (or 32ft.) is the depth from the curtain line to the centre of the dress-circle front, the remaining half being under the boxes, and devoted, partly to the unreserved stalls (*Anglicæ*, "pit"), partly to the gangway at the back, and partly occupied by the entrance lobby and the great air-shafts (of which more hereafter) which flank it. The height of the auditorium, from the centre of the stall floor to the ventilator, is 45ft., with another 8ft. to the sliding roof, while the width of the proscenium opening is 21ft. 6in., and the height from the stage to the top of the proscenium arch 23ft. Owing to the very slight rake of the stage, that of the several portions of the auditorium is much steeper than usual; even the stall floor raking 4ft. 6in. in the 64ft., or about 1 in 14. The stalls, the seats of which are 19in. wide and 3ft. from back to back, accommodate 500 persons; the dress circle, with its seven rows of roomy 21in. fauteuils on platforms 4ft. wide, with risers varying from 18in. to 24in. in height, seats 225, besides having, as is usual in Australian theatres, a wide gangway or promenade at the back; and the upper circle, with its six rows of leather-covered seats, together with the eight rows of the gallery further back, seats 700; making altogether seating accommodation for 1,425 persons.

As is customary in the warm climates, the only walls of the auditorium are the main walls. The internal walls (or divisions) and corridors that commonly surround the tiers in the more characteristic of the English and other European theatres are done away with, in order to allow of the freer circulation of the air; and, therefore, the structural forms peculiar to theatres are found only in the roofing and the lines of the circles. At the Palace Theatre the roof is formed by a tolerably steep elliptic dome sustained by groining supported from tier to tier on columns; while the circle fronts are of shallow horseshoe form, the private boxes being grouped separately by themselves. As the decoration is not only exceptionally elaborate, but altogether unique, and executed entirely in oils, a few preliminary words as to the mode of operation adopted may be of interest. The whole of the surfaces to be

coloured were first laid in with aluminium leaf (which, for convenience, may be called silver), and the various metallic tones, including some of the gold, were obtained by glazing with transparent French aniline dyes or lacquers—some of the different hues employed being obtained by a special process of burning and mixing particular dry colours with the lacquer—and in some cases subsequently stippling, either coarsely and roughly, or finely and completely, with more opaque gold or other colour. Stencilling was employed only for simple diapers. Wherever foliated ornament is used—which is very largely—the work was pounced, laid in with the brush (with just sufficient variation of colour to give life to the ornament, but without even the suggestion of relief), and outlined in umber. Where white is spoken of, it must be understood that not a particle of actual white is anywhere to be seen, but in reality a light drab, which, when lighted up at night, assumes the soft, warm appearance of biscuit-china. Not an atom of wall-paper is employed anywhere. The most elaborate of all the decoration is in the stalls. The walls are diapered with green and scarlet on a gold ground. The pier faces are more richly ornate, with fancifully gold-bordered silver panels and greenish foliated ornament upon a drab-green ground. The dado is in plain neutral tones. The windows (which in the daytime light the *salle* sufficiently for all practical purposes) present the scalloped Saracenic arch-head finished in white and gold, and are glazed with light stained glass of Indian design, in chiefly purple hues. Three curved ranges of beams resting upon silvered columns, with solidly gilt Indian caps, support the dress-circle. The front range is set back some 3ft. from the front, and above each cap a light ornamental cantilever is brought forward to support the soffit. At about the same distance back from the beam the soffit rakes upwards some 2ft. in vertical height, by a sort of cone, to the general level of the stall ceiling, which at the extreme back is 11ft. 6in. above the stall floor. The whole soffit of the circle, the beams, cove, and front divisions of the ceiling, are elaborately panelled and decorated with foliated ornaments on gold grounds, which, apart from the stippling mentioned above, possess a peculiar tapestry-like softness due to the fine fluting of the zinc on which they are painted. The central range of ceiling panels are embossed in low relief, and finished in white and gold; the centres being alternately pierced for ventilation, and filled with a mosaic of stained glass and a rose-coloured boss for electric lighting. The



panels along the soffits of the beams have silvered grounds of variegated hue, and the rear divisions of the ceiling, though less elaborate, are in slight relief and tinted. The stall seats, supplied by Mr. W. Fleming, of Sydney, are of an excellent American patent. They are ornamentally framed of yellow American mahogany, with standards of Indian design, executed in white malleable iron (made from scrap and old railway wheels, to give it toughness), and upholstered in light Indian red plush, bordered with deep olive green and gold. By a spring arrangement, as the seat tilts up the back falls somewhat forward, so that the whole, when not in use, presents a thickness of 5in. or 6in. only, while the arms project barely another inch or two. Provision is made, by means of folding wires, for storing hats beneath the seats, and shawls, &c., behind the backs, while the standards are so designed as to afford a rack for sticks and umbrellas, just above the floor. The stalls are laid throughout with velvet pile carpet of deep Indian red. The orchestra is sunk about 8in., and is separated from the stalls by handsome polished nickel rails and standards, hung with richly-bordered peacock plush. Close to the escape doors nearest the stage are short corridors, entered beneath a scalloped Saracenic arch, leading to the stage boxes, stage, and a circular iron staircase communicating privately with the upper portions of the house.

The treatment of the dress and upper circle fronts is altogether novel. The ornament is executed in low relief, and largely pierced, and is etched and outlined in gold on a warm and lightly-tinted ground, without any positive colour whatever. Abundant colour is obtained, however, by the lighting. In the centre of each ornamental device is a jewel-like mosaic of stained glass, behind which, in the boxing of the fronts, is placed an electric light, with a nickel parabolic reflector behind each bull's-eye, surrounded for some distance by a plain sheet of polished tin. The brilliant softness of the effect must be seen to be appreciated. In the dress-circle the columns supporting the two curved beams of the upper tier are fluted as well as silvered, with solid gilt bases and highly ornate Indian caps in white and gold. The treatment of the beams, soffits, &c., is much the same as in the stalls, though the designs are varied; only a lemon buff instead of gold is used for the ground, and the gold is introduced into the foliated ornament. The rake of the soffit is likewise very much greater, to allow for the steep pitch of the circle. The walls are arched with the scalloped Saracenic arch in white and gold; the ornamentation of the stall walls being repeated here upon the wall faces above the arches, while the spaces within them are diapered in silver on a dove ground. On the back walls each arch contains an elaborate foliated device on a stippled ground of dove and silver, the centre being of purple lacquer, while in the arches flanking the entrance of the *foyer* the grounds are of solid silver. The piers are treated in plain, neutral tones, with solidly-gilt caps, in order to lend breadth to the general effect. The American seats and the resters are upholstered in old gold plush, the lines of the seats forming unbroken curves of solid sofa stalls. The same colour, in a lower tone, is carried out in the velvet carpeting, while the inside of the circle fronts and the partition from the promenade are lined with peacock plush. The walls of the upper circle (which receive daylight through bull's-eyes glazed ornamentally like the stall windows) are powdered with large flaming golden stars and other devices on a lemon and gold ground.

The private boxes—two on each side at the dress-circle level, and two beneath—form almost separate structures of themselves of most elaborate and unique design. From a dadoed base, ornamented, like such plain wall-spaces as there are above it, with gold-bordered foliated panels of purple lacquer, are bayed out the elliptic centres of the stall (or stage) boxes, similarly decorated, the openings being enriched with scalloped Saracenic tracery within square heads. The dress-circle boxes are still more richly treated (all the fronts being in the same general style as the circle fronts), and brought more prominently forward, having each a triply cupolaed, pagoda-like canopy, the cupola supported upon light ornamental silver shafts with gilt caps and bases, and finished in purple lacquer with solidly gilt enrichments. Above each base rises again, from the upper-circle level, an eight-arched circular pavilion, dome-roofed like an Indian temple, and terminating in an elaborate silvered finish. The colonnettes are gilt and silvered, and the arches

are draped with sea-green silk. The whole structure (which is purely ornamental) is separated from the upper circle by a wrought-iron and partly silvered grille. The private boxes are hung with deep trellised fringe, and draped with curtains of the richest parti-coloured Indian silk with sky-blue lining; the walls are elaborately diapered in colour upon gold; the coved roofs are richly quilted in light silk; and the floors are laid with long-piled Indian carpets.

The most beautiful and artistic portion of the *salle* is undoubtedly the elliptic dome and pointed groining. The latter is in sixteen bays, supported upon fluted silvered shafts rising from the upper circle or bracked out from the over-proscenium. The caps are of most elaborate Indian design, treated in white and gold, and (with the abaci) are set diagonally to the face of the ellipse. Above the private boxes, where there is no support for columns, the pendentives terminate in pendants corresponding with the capitals. The pendentives are richly decorated with foliated ornament on every face, mostly in neutral blues and greens, upon a fluted and stippled ground of dull lemon and gold; and, while every face is defined by a separating gilt enrichment, the Oriental form is given to the main arches by means of scalloped tracery at the intrados. The ribs above the columns terminate at the corona with bracket-like finials, each bearing a silver eagle. The corona corresponds somewhat to an entablature; the frieze displays a white and silver scroll upon a pale blue ground. The whole finishes with a sort of bratticing; the principal feature is a series of trefoils glazed with dull amber glass, through which the electric light diffuses a warm and mellow lustre over the whole house. Behind, at a short distance, rises the dome, divided into 32 radiating panels, each containing a foliated ornament upon a silver ground, the colours growing lighter as they ascend towards the centre, and a small mass of orange at the springing of each device adding force to the lower portion. The eye of the dome consists of a large perforated ventilator surrounded with appropriate borders in neutral hues.

The proscenium displays the Oriental bulbous ogee arch with contracted spring, gilt solid, with a soffit scroll ornament in two shades of metallic purple, and enriched on the front with a series of scallops containing three-quarter rosettes in reddish metal upon a steel-blue ground, while above the apex of the arch reposes, in all the glory of the rudest lacquer, and probably to his own astonishment, no less a personage than the great Buddha himself. The arch is supported upon columns and piers gilt solid, while the spandrels above are richly foliated in low relief in various tones of lacquer bronze. The arch cuts through a frieze so panelled as to allow of the arrangement; above this the wall-space is formed into the three arches belonging to the groining, which are decorated with flat foliated ornament on dull green grounds, the grounds of the large central devices being the steel-blue lacquer.

Perhaps the richest and most imposing feature in the whole building is the proscenium curtain, which is a masterpiece of local embroidery. The ground is of peacock plush, on which an elaborate foliated design, with dado, borders, and medallion, is executed in *appliqué* work in gold lace and satin, finished up with hand-painting in transparent French dyes. There are no less than 2,500 insertions in the work, which occupied a staff of women three months, and the amount of gold lace used measures nearly 20,000 yards. This is the first curtain of the kind ever produced in Australia, and it may be doubted whether anything like it is to be found in any other theatre. A little way back is another and much plainer curtain, principally marone, and divided in the centre, which will be used for tableaux and other purely stage purposes.

With reference to the construction of the auditorium, the stall floor is formed of solid concrete carried upon brick walls and piers in the basement—the floors of which are also of concrete—placed at 8ft. centres, and spanned by corrugated iron arching. The whole is filled in with coke concrete, giving a thickness of 8in. at the crown of the arches. Resting upon the stall floor, and either supported by a pier or wall, or, where they do not strike either of these, upon a girder inserted to catch them, a series of shallow 6in. cast-iron columns (with 1½in. of metal support the dress-circle; similar 4in. columns (with 1in. metal) support the upper-circle, and a like range of 3in. solid shafts sustain, ostensibly, the groining of the dome; though, in reality,

the whole of the interior ceiling arrangement is hung from the structural roof. This is formed with two queen-post principals, with the necessary framing to support the dome and groining, and is covered with 1in. boarding, felt, and corrugated iron. Above the centre of the auditorium is the turret already mentioned, in which is a sliding-roof, worked from the flies on gun-metal bearings. The circles are directly carried upon laminated beams of Oregon pine, fitted into the shoes of the sustaining columns, which are cast specially to receive them. Each beam is composed of seven fitches 1½in. thick, and three ½in. steel plates, all bent to the curve of the circle, and bolted together at frequent intervals with ½in. iron bolts. The whole of the dome and groining, the proscenium and the circle fronts, as well as the elaborate structures which comprise the private boxes—features which are usually of papier-mâché, carton-pierre, or fibrous plaster—are here constructed entirely of embossed zinc fixed to Oregon framing, and for this extremely complicated production new machinery and special appliances had, in some cases, to be provided at the zinc works.

The stage is 50ft. wide and 30ft. deep—ample in dimensions for the class of entertainment proposed to be given. Along the back is an open area, in which are placed, as a precaution against danger, the limelight appliances. These, in the older Sydney theatres, are located directly under the stage, and at one place of amusement, not long since, an explosion occurred which cost a life. In accordance with modern principles, the floor (containing the usual "slots" and "traps") is practically level, while the stage area is entirely open up to the gridiron floor, 46ft. above the stage floor. There are neither "grooves" nor "wing-ladders," it being intended to entirely "build up" the scenes. The two sets of "flies," 6ft. wide, are placed right against the main side walls, communication being afforded by a bridge at the proscenium, and also by the painting-room, which, of course, is a wide gallery over the back of the stage, fitted with the completed conveniences in the way of running frames, stores, &c. The mezzanine is 7ft. below the stage, and the stage sink is 12ft. below the mezzanine; thus giving a total height and depth of 53ft. for the production of stage effects—nearly three times the extreme height of the proscenium arch. At the back of the mezzanine are several "quick-change" dressing-rooms, as well as baths and lavatories. The footlights, which, like all the other lights throughout the building (except a few gaslights here and there, provided in case of accident to the electric plant), are lit by electricity on the Swan-Edison incandescent principle, are sunk in a trough provided with a flap of iron, which falls over and protects them from dirt and injury when not in use, and which, when raised, forms the reflector. These lights are arranged in short lengths, and placed without permanent fixings, so that they can at any moment be readily removed for cleaning or repairs. In what are usually the wing and border gas-battens, the gas is, of course, replaced by electricity.

From the *foyer*, a staircase concealed from public view leads to a large rehearsal-room above, 52ft. by 26ft., intended for vocal rehearsals, ballet practice, &c., when the stage is otherwise engaged. The *foyer* itself is also available for musical rehearsals. The corresponding space in the basement, beneath the vestibule, is occupied by the engine-room, where are placed three large steam boilers, with Willins and Robertson's engines and Siemens dynamos combined, each dynamo of 800 ampères, with 112 volts and 460 revolutions, and sufficient for an installation of 1,250 lights, making altogether provision for 3,750 lights. The remainder of the basement, as far as the stage, is compactly planned, and devoted to the manager's office, green-room, music-room, dressing-rooms, property and other store-rooms, &c., all artificially ventilated and electrically lighted. The principal dressing-rooms are luxuriously furnished, and replete with every possible convenience. The walls throughout the building are of brickwork—mostly solid, though some in the basement are hollow; and all the stairs, when not of marble, or the treads of circular iron staircases, are of stone. The floors, where not of concrete, the platforms of the circles, &c., are of Oregon pine; but in some of the joinery fittings the best colonial pine is used.

Special attention has been paid to the ventilation. Apart from the central ventilator and sliding roof, the foul air is extracted by various



outlets in the stall and dress-circle floors, connected with pipes in the basement, which run into shafts built in the walls; these shafts are carried above the parapet of the building, and finished with exhaust cowls. The fresh air is introduced by the tall shafts already mentioned in connection with the exterior, of 5ft. by 3ft. internal dimensions, and having within them a fan worked by machinery. The shafts are carried down through the building, at the back of the auditorium, on either side of the central entrance to it, and communicate with a cooling chamber in the basement, fitted with Hudson's patent (a local patent for cooling), whence the cooled air passes into receiving chambers beneath the stalls, dress-circle, and upper-circle, from which it is distributed by pipes all over the building—in the circles by apertures in the risers of the tiers, and in the stalls by standards. The ventilating system is likewise extended, as already mentioned, to the dressing and other rooms situated in the basement.

The architect of the building, as previously stated, is Mr. R. Clarence Backhouse, F.I.A., N.S.W., from whose designs, and under whose immediate superintendence, the whole erection has been carried out by day-work in the space of fifteen months. As regards the auditorium, however, the inspiring genius has been Mr. Phil. W. Goatcher, who is not only the scenic artist and decorator of the theatre, but likewise sole lessee and director. The architect's difficulties—exceptionally great in the case of most theatres—were not diminished by his having to embody in tangible and concrete construction the scene-painter's artistic Oriental dreams and not always too practicable sketches; the problems, however, were solved in a manner that does credit to all concerned, and with a minimum of friction. In this department of the work material assistance was afforded by Mr. Ernest Wunderlich, managing director of the Wunderlich Patent Ceiling and Roofing Company, Limited, who carried out the whole of the surface construction of the auditorium, as well as a good deal of the external work, in embossed zinc—one of the most elaborate and complicated works in zinc construction that has yet been undertaken in any country. The paintings and other coloured decorations, as well as the scenery, have been executed by Mr. Goatcher and assistants, that gentleman having also designed in detail, and finished with hand-painting, the elaborate curtain, which is valued at £1,000. Fortunately, there was no stint of funds, and accordingly the total cost of this perfect little theatre—site, structure, small stock of scenery, and electric-lighting plant (which alone cost some £10,000)—will eventually amount to fully £60,000. When seen by daylight, the effect of the interior is somewhat garish; but when illuminated at night by the peculiar mode of lighting adopted, the whole combines and harmonises into a general effect of surprisingly soft richness, which interferes but little with the stage effects.

#### THE BUILDING TRADES EXHIBITION.

THE Building Trades Exhibition, which will be opened to-morrow (Saturday) at noon by the Lord Mayor, in state (and will be closed on the following Saturday, March 27, when Sir Arthur Arnold will distribute the prizes in the handicrafts competitions at 5 p.m.), bids fair to be the most successful ever held. To the Society of Architects, which twelve years ago arranged a similar exhibition in the Floral Hall, Covent Garden, must always be given credit for the first attempt to arrange such a show on legitimate and satisfactory lines. Mr. H. Greville Montgomery, who revived the exhibition two years since, with most happy results, has had the wisdom and the tact to work upon and expand the methods adopted by the Society of Architects; and he has most deservedly attracted the support of the principal architectural societies, the leading members of the architectural profession, and the hearty co-operation of the Corporation of London, and the chief City guilds connected with the crafts.

The cordial help of the Executive Council, on which appear the well-known names of most of the leading architects and others interested in the progress of the allied arts of construction and design, has greatly helped the spirited projector; and especially the ready courtesy and unwearied attention of the chairman, Professor Banister

Fletcher, has elicited support in every advantageous quarter. The conferences, and the displays of handicraft—which are greatly extended this year—cannot fail to attract audiences and spectators, and the exhibitors will rejoice at this. It is comparatively easy to organise an exhibition and make it pay out of the rents demanded of exhibitors; but people who pay for admission, and those really interested in the exhibits, will not attend unless attracted by something worth seeing and hearing. Mr. Greville Montgomery and his co-helps have thoroughly recognised this, and there is no doubt that the Agricultural Hall will be well filled during the coming week.

The arrangements, as at present fixed, are as follows:—

**SATURDAY (OPENING DAY).—**Opening Ceremony by the Lord Mayor at Noon. Visit of the Architectural Association at 3 o'clock.

**MONDAY.—**Visit of the Association of Municipal and County Engineers, at 4 o'clock.

**TUESDAY.—**Annual Meeting of the Institute of Clay-workers.

**WEDNESDAY.—**Visit of the Builders' Merchants' Association of London.

**THURSDAY.—**Conference of House Painters and Decorators, at 7.30.

**SATURDAY.—**Distribution of Prizes to Successful Competitors in Handicrafts. 5 p.m.

Instead of protracting the exhibition throughout a fortnight—during the earlier days of which unfinished stands rather deter than attract visitors—it has been determined this year to close it on Saturday week. The one drawback in connection with this alteration is that we shall only have one opportunity, instead of two, of drawing attention to the exhibits. We therefore append a few preliminary notes of some of them, which, where necessary, we shall supplement in our fuller notice next week.

Messrs. Candy and Co., Limited, of 11, Queen Victoria-street, and Newton Abbot, will show a full and varied selection of their specialities in bricks and pottery, consisting of white and coloured glazed bricks and brown stoneware. Their stoneware sanitary pipes, bends, junctions, gullies, and sewer-gas excluders are second to none, as also are their well-known granite vitrified paving bricks—especially the buff vitrified paving bricks without cross grooves, as supplied to the War Office, of which they are the sole makers. In architectural terracotta, Messrs. Candy and Co. have achieved a deserved pre-eminence, and terracotta facing and moulded bricks in buff, white, and grey, made from selected clays, will well repay examination.

The Incandescent Gas-Light Company exhibits an assortment of its well-known burners. The "Welsbach" system of incandescent gas-lighting is now too well known to need description. It is the only efficient competitor with the electric light, over which, in point of cost, it offers decided advantages. Apart from the enormous saving in gas, the hygienic results of the adoption of the Welsbach burner are most satisfactory. There is a total absence of the poisonous gases common with other burners, a great diminution of heat, and a total absence of smoke. The artistic designs shown of gaseliers, brackets, &c., are of a very high class.

Aspinall's Enamel is known throughout the world as a household help to decoration. The exhibit of this speciality is sure to prove an attractive one. But besides enamel in various tints, Aspinalls have other beautifiers. Their "Wapicti," the new washable distemper paint, is sanitary, economical, and artistic, is manufactured in every tint, and can be equally satisfactorily applied to plaster, stucco, brick, stone, cement, wood, &c. "Wapicti" will bear washing, and so the great enemy of the housewife, dust, may be laid to rest. "Wapicti" dries quickly, and is death to germs. Aspinall's Enamel, and metallic gold and silver, and various combinations afford an economical means of renovating picture and mirror frames, gas and electric-light chandeliers, brackets, and everything from bric-à-brac to the most solid articles of furniture of all descriptions. For stable fittings, walls, harness, and a multitudinous variety of uses there is nothing better than the ubiquitous Aspinall.

Messrs. F. McNeill and Co., of Lamb's Buildings, Bunhill-row, E.C., will exhibit specimens of their well-known Fibrous Asphalte and Patent Metal Asphalte, the merits of which as damp-proof courses are well established. Their Slag Wool is equally well known as a fire-proofing, sound-deadening, and heat and cold resisting material. Slag wool is a pure mineral glass-like fibre manufactured from iron slag; but

the special process adopted by Messrs. F. McNeill and Co. has many advantages, as the material is blown far finer, and is therefore much lighter than that made direct from the blast furnace. As a protection against heat and frost, against vermin, or as a non-conductor of sound, slag wool has no equal. It is impossible here to give any adequate idea of the multitudinous uses to which it may be put in connection with building construction, as set forth in a most useful little pamphlet published by Messrs. F. McNeill and Co. on "The Uses of Slag Wool," which we advise every visitor to the Agricultural Hall to get a copy of. There are some hints in it of great practical value to architects and builders.

Mr. George Wragge, of Salford, has on view a novel Baldacchino executed in wrought iron—so far as we know, the only example in an English church. It is designed by Mr. Medland Taylor, and is intended for a church at Burnley. A wrought-iron gate is also shown, for the main entrance of the National Provincial Bank at Leeds, gates for premises at Bolton, and various sections of metal casements and sashes in bronze, steel, and iron. A well-designed sign—one of two in hand for the London and Lancashire Insurance Company, with polished copper letters, is an attractive feature. Of equal interest are some well-executed examples of repoussé work in copper, brass, pewter, &c., by Mr. Wragge's apprentices, for whose improvement he has specially engaged a teacher from a London school of handicraft. Mr. Wragge tells us he found it so difficult to get craftsmen in the open labour market, that he determined to have apprentices and specially train them, and architects and other visitors will, no doubt, be glad to judge how far his praiseworthy attempt is proving successful.

Messrs. S. and E. Collier, of Grovelands, Reading, whose excellence in really good brick and tile goods is almost proverbial, contribute a varied and comprehensive selection of red tiles, ornamental and plain, for roofs and vertical tiling; also small tiles for porches, &c., where the work is close to the eye. We direct special attention to their Fletcher patent vacuum chimney-pot. This pot is undoubtedly most successful in curing chimneys that are troubled with down-draught. Messrs. S. and E. Collier also show oven tiles for bakers' ovens, which are of a special mixture, to give a warm bottom to the oven, and yet the bricks are of such a nature that they do not fly to pieces in the fire.

The exhibit of the Expanded Metal Co., Ltd., of 39, Upper Thames-street, E.C., is one that will afford many opportunities of careful study. It consists of samples of their new expanded metal in steel, brass, copper, aluminium, &c.; also fencing, hurdles, tree-guards, &c., of various descriptions, and specimens showing the application of the metal for concrete floors, suspended ceilings, solid partitions, and encasing ironwork. We have been struck with the remarkable results the Expanded Metal Company has achieved in demonstrating the practicability of utilising concrete—remarkable, at least, as far as this country is concerned, for we are considerably behind our Continental brethren in this respect, and we hope before long to have an opportunity of dealing specially therewith. Meanwhile, we advise every architect and builder to familiarise themselves with the Expanded Metal Company's specialities.

In the whole exhibition there is no more deserving a display than that of the Cameo Wood Working Company, of 96A, Victoria-street, Westminster. We shall have something more to say about their exhibits next week; but would now especially direct attention to the Buffet and Overmantel in oak, walnut, and mahogany they exhibit. The capability of the process adopted by the Cameo Company is almost boundless. The variety and permanence of the shades of colour obtained, at the most moderate cost, is really wonderful, and there is scarcely any purpose to which it cannot be applied. Water-proof and weather-proof, the decoration attained defies accident or injury.

Messrs. Joseph Kaye and Son, Limited, of 93, High Holborn, and Leeds, as usual are well represented with their well-known door furniture and patent "push-and-pull" locks. The numerous applications of this most useful patent are very interesting.

Mr. W. Gooding, of North-road, Holloway, N., exhibits his patent interchangeable stair-treads. These consist of an iron keeper pierced with a number of square-shaped holes, through



which blocks of rubber are placed, these blocks forming the wearing surface, and affording a perfectly firm footing. They are easily adapted to existing stairs, and can be readily fixed, two or three screws being sufficient to keep them in position. The majority of people pass up the staircase in the centre. Thus the centre of the treads becomes worn before the two ends. When the rubbers in the centre are worn down to the level of the keeper they can be moved to the ends, and those at the ends, which are not so much worn, brought into the centre, thus avoiding the expense of new blocks for some time.

Messrs. Peters, Bartsch, and Co., of Derby, will not fail to command the attention of all users of steam boilers for their patent for the absolute prevention of boiler incrustation by the addition of chrome salts to the feedwater. The terms on which they grant licenses are very reasonable, and the economy secured very great. The same firm's indestructible combination washers for the flange-joints of steam and water pipes are also very durable. They cannot possibly be blown out, and they readily accommodate themselves to any unevenness.

The sliding window-fittings of the N.A.P. Window Company, of 159, Victoria-street, are now familiar in every thoroughfare. They ought to be much more so, and the public generally will do well to examine this exhibit. A set of these fittings, costing only 6s. 6d., or 12s. 6d., and applied to a pair of double-hung sashes, absolutely prevents window-cleaning accidents, and the cost will be repaid in twelve months by the avoidance of the professional window-cleaner's charges.

Messrs. Pilkington and Co., of Monument Chambers, E.C., show a good selection of their patent asphalt and felt roofing, and white silica paving. An acid-resisting asphalt supplied by this firm will commend itself to architects specifying for chemical works, laboratories, and the like.

Messrs. W. E. Rendle and Co., of 5, Victoria-street, S.W., are as usual in the forefront with their well-known "Invincible" system of glass roofing. First in the field, and still first as regards utility and universality of adoption, it is so generally specified by architects and engineers who have large roof surfaces to glaze, that we need only chronicle its exhibition.

As manufacturers of glazed bricks, terracotta, and sanitary ware of all descriptions, Messrs. Joseph Cliff and Sons, of Baltic Wharf, Waterloo Bridge, S.E., have challenged the world for more than a century. Among their latest additions are their Imperial porcelain baths and sinks, which no one who values cleanliness and luxury at small cost in the bath-room or kitchen will fail to examine. In scores of other branches, Messrs. Cliff and Sons are equally unrivalled.

Messrs. F. Jones and Co. of Perrin-street, N.W., attract attention with a good display of their patent British-made silicate cotton, or slag wool, and fibrous soundproof and other plaster slabs. These are specialties, which we need do little but once again call attention to, so absolutely necessary are they in modern buildings in all large towns.

The Val de Travers Asphalte Co. of Hamilton House, Bishopsgate-street Without, exemplify the many applications of their well-known compressed or mastic asphalt. As a lasting material for basements it has no superior. We speak from long experience, having used it in our own machine room, where the wear is very heavy, the continual lifting down of heavy plates from the large web-printing machines being a somewhat severe tax on the durability of the floor. It is equally suitable for roadways, footways, damp-courses, roofs, stables, slaughter-houses, breweries, lavatories, tennis-courts, &c.

The "Dioptric" pavement lights manufactured by Messrs. Wilson and Co., of 24, Harrison-street, Gray's Inn-road, W.C., were recently illustrated and described by us. The "dioptric" light is a lenticular prism of a form that most advantageously collects and distributes light throughout dark cellars and basements. The "safety" pavement lights of the same firm are worth the attention of all who wish to prevent accidents in busy streets. They are made with lead between the glass prisms, and prevent slipping, as well as dispensing with the studs. The "dripless" lights, which prevent condensation of the moisture falling on goods stored below, must be of great advantage to all drapers and others storers of easily-spoilable goods.

Wood-block flooring is more and more used in all good-class buildings every year, but architects

have at times been disinclined to specify it on account of disadvantages resulting from bad systems. The system introduced by Messrs. Charteris and Longley, of Earl-street, Westminster, is a thoroughly dependable one. Every block laid is dovetail rabbeted on the undersides, and continued to form tongues which enter the dovetail rabbits of the adjacent blocks. Loose tongues or dowels are impossible under this system—given, of course, good wood. We think architects and builders who inspect Messrs. Charteris and Longley's stand at the exhibition will be convinced that the firm make it their object to insure the most perfect seasoning. This is effected by an elaborate system of drying-rooms worked on Shapland's direct process, which dries the wood without deteriorating its substance or natural qualities. All the blocks used are prepared at the firm's own works, at Crawley and Peckham, by special machinery, which not only cuts off the material to length, but shapes the special tongues on both ends at one operation. Durability, simplicity, and absolute rigidity are the three principal features of this system of wood flooring, which is very little, if at all, more costly than more antiquated methods.

Few visitors to the Exhibition will omit a call at, to us, one of the most attractive stands—that of Mr. B. T. Batsford, of 94, High Holborn, who for more years than we care to remember, or perhaps he will wish to be reminded, has been the publisher and bookseller of the architectural profession and the building trades. Goodly samples of his varied wares are on view, and many a handy specimen thereof, we expect, will find its way next week into the pockets of visitors to the exhibition.

#### WOODWORKING MACHINERY.

**A**MONGST the improvements lately made in labour-saving machinery, we have much pleasure in mentioning a few new appliances which the well-known firm of Messrs. F. W. Reynolds and Co., saw mills and general engineers, of Acorn Works, Edward-street, Blackfriars-road, S.E., have introduced to the notice of the building trade. Many large firms of builders have need for getting rid of their waste. Messrs. Reynolds and Co. have patented a most useful machine for this purpose. The "patent firewood splitting machine" is exceedingly compact and simple in its parts. The blocks of wood or ends of deals, &c., are placed in an inclined hopper or trough in short lengths, and slide down by their own gravity on to a spring plate, which regulates the distance the block projects through the mouth of machine. A chopper then descends splitting off a slab from the block, which is held in its place by the spring plate. The slab is driven down through revolving discs which split it into sticks. These discs move sideways on their spindle. The sticks are thrown out on the ground. The thickness of the slabs to be split is regulated by a screw, and the machine has double connecting-rods and fast-and-loose driving pulleys. The output per minute is about 1,000 sticks, with a 2H.P. engine, and a lad can feed the machine. The weight is only 13cwt., and the price £45.

We must also notice a very strong and improved band-saw machine made by this firm, the "No. 5 pattern." The frame is of box-section, preventing vibration, and the pulleys for band-saw are of wrought iron covered with india-rubber. The new feature of this machine consists in the saw-guides above and below the table, by which the band-saw is steadied and kept in position. These new guides consist of a backing strip of steel which can be shifted or turned over as it wears, and several thicknesses of steel, the ends of which are set against the sides of the saw according to its width, the whole clamped by thumb-screws on the front of the guide-holder. The dust-guard below the lower guide is an improvement, and the long bronze bearings for the driving spindle are also a preventive of vibration and wear. These machines have tables made to each for bevel-cutting, and are made in several sizes, and the saws will cut from 12in. to 20in. deep. A new planing-machine which will plane, try up, joint, rebate, work mouldings or sash-bars, tongue, groove-chamfer, stop-chamfer, &c., is well worth the inspection of builders who require a really useful machine for general work. The work is passed by hand over the cutters, and follows off true on to the finishing table. The tables are carried on four inclined guides, and are made to rise and fall by screw and hand-wheel,

great steadiness being insured. An inspection of this machine will show how many operations can be performed. Pressure rollers and side-springs can be used when the work cannot be held. Messrs. Reynolds and Co.'s patent "combined hand and power mortising machine" is one of the cheapest and most efficient machines for mortising we know of. We described it on its first appearance, but it may not be known by all. When driven by power it will turn out five times more work than the ordinary hand machine. For small joinery works we know of no appliance so useful, as it can be worked by hand-power. The machine will mortise 11in. deep, and will take stuff 6in. wide. The price is marked as low as £19 19s. with six chisels. We saw many other labour-saving machines which are worth inspecting. Those interested in machinery of this class will do well to look at Reynolds and Co.'s catalogue before making arrangements.

#### THE AUCTIONEERS' INSTITUTE AT SHEFFIELD.

**T**HE Sheffield meeting of the Auctioneers' Institute of the United Kingdom was held on Monday in the Cutlers' Hall of that city. The President, Mr. James F. Field, took the chair at the council meeting, and was supported by delegates from London, Leeds, Oxford, Cambridge, Bradford, Chesterfield, Wakefield, Keighley, Wigan, Sowerby Bridge, Halifax, Batley, Sheffield, and other towns. There was a numerous attendance. The president read a letter which he had received from the Board of Inland Revenue, stating that the subject of valuations of property for estate duties had often been under consideration; that the Board adhered to their view that it would not be desirable to make valuations by a professional valuer compulsory in every case. A small sub-committee was appointed to inquire as to the methods of procedure for the securing the Royal Charter for their body. The report of the Office Management Committee was approved. Mr. J. J. Greaves, of Sheffield, and Mr. Douglas Young, of London, were unanimously elected on the council of the Institute.

In the evening the annual dinner was held in the Masonic Hall, the president, Mr. James F. Field, occupying the chair. He was supported by Mr. James Catling, Cambridge; Mr. E. Dobson, Bradford; Mr. W. Roland Peek, London; Mr. G. Gordon Stanham, London; Mr. R. Buckill, Oxford; Mr. J. Hepper, Leeds; Mr. E. W. Richardson, London; Mr. J. H. Townsend Green, London; Mr. Batty Langley, M.P.; Mr. H. Bramley, Town Clerk, Sheffield; Lieut.-Col. Bingham, Sheffield; Mr. E. Howell, President of the Sheffield Chamber of Commerce; Mr. C. F. Wike, Sheffield City Surveyor; Mr. F. S. Hatchard, Pontefract; Mr. J. J. Greaves, Sheffield; Mr. C. Ellis, Sheffield; and Mr. H. Hargreaves, Leeds. The loyal toasts were given by the president and duly honoured. He then gave "The Imperial Parliament." Mr. Batty Langley, M.P., responded. He was exceedingly pleased to see that the Institute of Auctioneers was incorporated, and that they had advanced considerably during the last six years. They existed for two purposes—first, to improve their status; in the second place, to dispense, although in a very small degree, charity to those who, from no fault of their own, had become necessitous. The position of auctioneers in this country was vastly different from the position occupied some years ago. It was said that if a public man failed or was not a success, all he had to do was to turn auctioneer. They now found that view altered considerably, for the trade and commerce of this country would do badly without auctioneers. The president next gave "The City of Sheffield." Mr. Herbert Bramley, town clerk of Sheffield, in responding, remarked that they had recently in Sheffield been really trying to improve the city. The corporation had a short time ago set aside £300,000 to improve one of the streets in the centre of the city—High-street—and were not behind in the matter of the provision of better houses for the working classes. Mr. F. S. Hatchard proposed the toast of "The Trade and Commerce of Sheffield." Mr. S. E. Howell, president of the Sheffield Chamber of Commerce, and Mr. Herbert Hughes responded. Mr. Herbert Bramley gave "Success to the Auctioneers' Institute." They were, he believed, now ten years old, and were a child growing fast into manhood. He was glad to find that the growth had been of late very considerable, and they were



adding to their ranks every year. When he saw from their examination scheme that in future they were to be auctioneers and valuers, not by rule of thumb, as in old days, but were to follow the best traditions of their class, and not the worst, and to cast the black sheep from their midst, he thought they had taken more than the first step on the ladder which would raise them to be respected by other professions in the country. He saw they allowed a larger proportion of members on their council from the provinces than from London—very different from most other professions, but doubtless owing to the fact that their membership was gathered largely from the provinces. The President, in responding, claimed that the profession of auctioneering was equally honourable with any of the learned professions. There was generally a mistaken idea of auctioneering. Many thought an auctioneer was something of a vulture, and that he prospered on the misfortunes of others. This was because they were called upon occasionally to sell up the effects of those less fortunate than themselves; but to suppose that in that rested their prosperity was the greatest fallacy imaginable. He agreed with the sentiment that when others were prosperous they were prosperous; when trade was flourishing they succeeded. As an Institute they were yet young; but they were strong and flourishing. Their object was to build up a society which would imitate and emulate the old Guilds of the country. Mr. John Hepper (Leeds) proposed the "Law, Accountants', and Architects' Societies of Sheffield and District." He said he had been associated with lawyers for forty years, and he recognised the valuable aid he and his brother auctioneers had received from them. The accountants, he thought, had rather trenched on auctioneers' privileges of late, but he asked accountants to be as merciful as they could with architects and surveyors. Mr. W. B. Esam, in responding, referred to the kindly feeling which existed between the legal profession and that of auctioneers, and hoped it might long continue. Mr. J. W. Barber, Past President of the Chartered Accountants, in thanking those present for the toast, said that one of the great advantages of these associations was that it made more marked the distinction between each profession. Mr. G. Hadfield, President of the Architects' and Surveyors' Society, also responded. "The Visitors" was proposed by Mr. Isaac Ellis, and responded to by Lieut.-Col. Bingham.

#### CHIPS.

The Royal Society of British Artists dined together on Monday night, the president, Mr. T. Wyke Bayliss, in the chair, to commemorate the fiftieth anniversary of the grant of the Royal Charter. The Queen had been pleased to command that the Address of the President should be laid before her; and in her acknowledgement of it she expressed her congratulations and her appreciation of the valuable work accomplished by the Society during a period coincident with her own life. Mr. Wyke Bayliss, in proposing the toast of the evening, gave a sketch of the history of the Society, which included a list of the great men whose works had found places upon the walls of the Suffolk-street Galleries.

An oak screen which has been placed between the north transept and the chancel of Darlaston Church was dedicated last week. The screen is of English oak, with open tracery heads arched and richly foliated. The head rail is carved with a leaf ornament springing from the hollow of the moulding. The work has been done by Mr. J. Howl for the builders, Messrs. Hammond Bros., to the design prepared by Mr. Farmer, of the firm of Messrs. Hickton and Farmer, architects.

Among the relieving orders gazetted on Tuesday, the name occurs of George Henry Wilkins, of Pensford, Somerset, and Bristol, builder and contractor; and in the list of adjudications is that of Arthur Henry Bunnett (trading as A. H. Bunnett and Co.), Deptford and Florence-road, New Cross, S.E., revolving shutter maker.

The London County Council on Tuesday instructed Mr. A. R. Binnie, their engineer, to proceed with the preparations of plans and sections of the Wye portions of their Welsh scheme of water supply for the Metropolis, and voted £1,800 towards the expenses. They also approved a "Canal Fencing (London) Bill," which provides that whenever, in the opinion of the local authority, there is a dangerous facility of access to the banks of a canal, power be given to the local authority to call upon the canal company to protect the banks with proper fencing to be erected at the expense of the company. The measure is to be introduced next session.

#### LEGAL INTELLIGENCE.

THE POSTAGE OF RETURNED NEWSPAPERS.—At Bow-street on Wednesday, before Mr. Vaughan, Mr. E. J. Kibblewhite, managing director of the Strand Newspaper Company, Limited, appeared to an adjourned summons requiring him to pay 4½d. due to the postal authorities for the return of nine undelivered postal packets, being copies of the *Weekly Times and Echo*. Mr. E. Winter supported the summons on behalf of the Postmaster-General. The case had been adjourned by Mr. Vaughan that he might consider his decision. Mr. Vaughan now said it appeared on the last occasion that this summons was taken out by the Postmaster-General to require the defendant company to pay 4½d. in respect of postage upon nine newspapers which had been sent through the post, but, for various causes, could not be delivered, and so were returned to the senders, in accordance with a request printed upon the wrappers. For the defence it was contended that there was no power under the statute of making a demand for the payment of services rendered in returning these papers to the senders. The Act of Parliament under which the proceedings were taken was the Post Office Act of 1875, the first section of which enacted that the Treasury might from time to time by warrant fix the rates of postage and other sums to be charged by them under the authority of the Postmaster-General. The rate of postage on a newspaper was fixed at 4d.; but it was further provided, under section 4, that "all postal packets shall be subject to such regulations . . . respecting the payment of rates of postage and other sums chargeable under this Act, or any warrant made under this Act." That being the case, it followed that any warrant made by the Commissioners of the Treasury had the force of an Act of Parliament. A warrant was issued on Nov. 13, 1894, which provided, amongst other things, that with regard to any postal packet chargeable by law with a postage not exceeding 4d., and with regard to any newspaper, which in any case could not be delivered, the following conditions should apply:— "When a request for the return of such postal packet to the sender thereof appears on the outside of such packet, such packet shall be charged with a new and distinct rate of postage equal in amount to the prepaid rate of postage originally chargeable upon the packet, and such rate and postage shall be paid by the sender of such package." Mr. Vaughan concluded:—It appears to me to be most clear that the original postage upon the paper was a postage which was exhausted by the attempt to deliver the paper to the recipient; that, in complying with the request of the defendant for the return of the paper to him, there was a new state of circumstances arising; there were fresh duties imposed upon the Postmaster-General; there was a fresh service rendered; and for that fresh service it is perfectly clear that the claim of 4½d. is one in regard to which there can be no possibility of refusal without an infringement of the law. Therefore, I must make an order for the payment of this sum—4½d.—and the costs of the summons." Mr. Winter asked if the magistrate would increase the order for costs. Mr. Vaughan replied that he had considered that point, and, as this was in the nature of a test case, he did not think it would be just to require the defendant to pay any larger costs. An order for the payment of 2s. 4½d. was made accordingly.

T. DREW-BEAR, TOLPUTT, and BROWN V. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON. JUDGMENT.—Mr. Edward Ridley, Q.C., the Official Referee, who has heard this protracted and important case, gave judgment on Wednesday in his court at the Old Bankruptcy Buildings, Portugal-street. The successive hearings of the action have been reported in our issues of July 17 and 24 and November 20 and 27, 1896 (pp. 98, 133, 755, and 769 last volume), Jan. 22 and 29 last (pp. 149 and 185), and of the 5th and 12th inst. (pp. 365 and 379). The learned Official Referee observed that this case was, in some respects, a remarkable one—firstly, in the numerous details which had to be considered, and secondly, in respect to the circumstances of the contract itself, and the incidents which arose during the performance of the contract. The question arose, What was the power of the architects? and, after considering all the circumstances, he could not do otherwise than absolve them from the consequences of the action on the ground that there was no evidence that they had been guilty of fraud, dishonesty, or collusion, and therefore the action was not maintainable against them. That was still his opinion, and Mr. Harston was entitled to the full benefit of it; but he was bound to add that he felt strongly that the decisions given by Mr. C. Harston as arbitrator under the contract were not capable of justification. He accepted, however, Mr. Harston's word on oath that, in doing what he did, he acted to the best of his ability as arbitrator under the contract. Mr. Harston had stated that, in his opinion, it would not have been fair if any other arbitrator had been appointed under the clause contained in the contract. He could not understand that. To whom would it have been unfair? Certainly not to the builder,

nor to the guardians, unless the latter board had a right to expect from Mr. Harston a more favourable decision than they would expect from someone else who was in an independent position. Certainly it was not unfair to Mr. Harston himself, unless he was afraid of the judgment of an independent arbitrator on his specification. He would now proceed to answer questions suggested by Mr. Bray on behalf of the builder and his trustees, and whether or not they were entitled to recover from the guardians anything beyond the contract price which was stated in the contract, adding, of course, the payments which might be allowed for extras on orders given by the architect. It was clear that the guardians were not liable to pay plaintiffs in respect of damages due to any acts of the architects unless they interfered in the matter and induced the architects to give a decision on any point in their favour. Such conduct would be collusion between the architects and the building owners, of which there was no evidence in this case. Indeed, it was perfectly clear that the guardians quite properly abstained from interfering through their building committee in the matters between the architects and the contractor, but left the whole matter in the hands of the architects, and accepted their decisions. As to whether the builders ever complained to the guardians of the delay in getting possession, or of the conduct of the architects, the evidence was in direct conflict; but whereas the story of the builders was circumstantial, it was met on the part of the guardians by a direct negative, and he accepted the suggestion that the latter did not recollect it. He did not find that the guardians went to the architects in any way, or objected to what they had done. The learned Referee referred to the decision of Mr. Justice Mellor in the case of "Roberts v. Bury Improvement Commissioners," given in 1870, and upheld by the Court of Appeal, reported in "Hudson's Law of Building Contracts," in which it was held that where undue interference by the architect in his capacity of arbitrator delayed the performance of the contract by the builder, the builder had no remedy against the employer or the architect, except in the case of collusion between them (which was not shown in this case); but where the duties of the architect were those of agent, his defaults were those of his employer. Mr. Bray had argued that, apart from interference by the guardians with the architects, there still might be a liability on the part of the guardians arising out of the contractor being prevented by the acts or defaults from carrying out his contract—namely, by not giving him possession of the site sufficiently quickly—a point decided in 1888 in the case of "Bush v. the Trustees of the Port and Town of Whitehaven," also referred to in Mr. Hudson's book. In that case it was held that the conditions of work were so altered, through no default of the contractors, that the contract was determined, and the builders recovered £600; but the circumstances were clearly very different to those of the present case. But although the circumstances were not in this case so completely and materially altered as to amount to a rescission of the contract, yet it might be that things might have happened which caused the results to be very different from what was intended, and, if so, the question came up whether they arose from any default of the guardians. Mr. English Harrison had strenuously contended throughout that his clients were without blame in the matter, and he must go, therefore, very carefully into this matter before arriving at a decision. The first and most important thing which had to be decided was as to the delay which took place in gaining possession of the site. Did this arise from any act of the contractor? If it was not his fault, the delay might be held simply to relieve the builder from any penalties due for not performing his work in the specified time; or, secondly, it might be the ground for a claim for damages; or, thirdly, the delay might be such as to cause a contract to cease to be binding. The delay in this case was certainly the chief and most important matter which had to be determined. He (the Official Referee) did not think that in regard to other matters it was necessary to be so precise; but in reference to the delay he must refer in detail to the specification and conditions of contract entered into by Kirk and Randall, and the revised ones signed by Brooks. The latter stipulated that the works were to be finished within 15 months from May, 1892. It was arranged on the part of the guardians that the board reserved the right to say that they should retain the inmates in certain blocks, and that, therefore, the builders would not be able to take possession of those portions of the site; but if they turned to the contract there was no such power reserved, but the contractor had a right to immediate possession, perhaps not in every trivial detail, but, speaking broadly, it was the duty of the guardians to give immediate possession of the site. At any rate this was the case when the first section had been completed by Kirk and Randall, and when Brooks came on the scene, he, as contractor, had the right to demand immediate possession. Mr. Moyses had argued in reference to this point that it was never intended that Brooks should have immediate possession of



the whole of the site; but Captain Miller, the master as the workhouse was called, and told them that he had made arrangements whereby all the inmates could be turned out within 48 hours, and why did he do so unless the contractor was to have possession at once? But, as a matter of evidence, they learned that the contractor only got possession of various blocks at intervals, some (according to defendants) not till March, or (according to plaintiffs) June, 1893. He could not see that this delay arose through any fault on the part of the contractor, nor was there any complaint made against him that he deliberately wasted time. It was more than doubtful whether Fearon or Brooks had been told that arrangements had been made for boarding out the inmates, and so clearing the building. Neither Captain Miller nor Mr. Millward, the clerk of the guardians, seemed to have informed the builder on this point, and Fearon's evidence made it a matter of extreme doubt whether this was ever made clear to him. Another argument that the delay was not due to the contractor existed in the fact that no complaint was made on the matter to the guardians by the Harstons as to the contractor's delay in beginning the job—in fact, Fearon asserted that neither Miller, Millward, Harston, nor Poole ever asked him as the builder why he did not begin earlier. Certainly it was not to the advantage of Brooks, Fearon, or the trustees to cause delays. If anyone found a builder scamping the work and putting in bad stuff, they would naturally anticipate that the man who did one thing badly would do another thing badly, and that they had got a contractor who did not know his trade. It was, therefore, important to see what had really taken place. He was quite aware that there were two or three bad bits in the roof at the workhouse, because he had examined the building, and had seen them. He was also aware that some of the flooring boards in the lower floors were warped badly, and would not fit, and the last bit of brickwork finished—that in the back of block H—was of somewhat inferior quality; but otherwise the job, as he saw it, was a very good one for its purpose, even in the rejected columns, of which they had heard so much; the work pleased him, and he hoped it would be so found by the guardians. There were a few sappy boards, and the handrail was insufficient for its purpose, but he could not understand why Poole made no objections to it at once, before it was all put up. It was true it was Harston's, and not Poole's, place to complain, but Poole had certainly not failed to call attention to any materials to which he objected, but when all was said and done he did not believe he got better bricks, &c., on the job. By taking such wholesale objections and rejecting so much material an architect ran the risk that the builder would somehow or other escape observation and try to get in other inferior stuff which would bring him out right from the contract. He should naturally have expected this, but he did not find that it was so in this case. Looking at the whole of the evidence on this part of the case, he thought it was a fair inference that the delay was not caused by Brooks or his manager, Fearon, but by the guardians, or those who represented them, in failing to give possession of the site. None of the other breaches of contract alleged, which had some existence in fact, equalled in importance the breach of the condition giving the contractor possession of the site. Having referred to the right of way across part of the site, and the retention of various buildings, and the interference with the plaintiffs' workmen by other trades, the learned Referee dealt with the allegations that Poole constantly and arbitrarily interfered, rejected materials, and made it almost impossible to carry out the job. It was charged against the clerk of works that he tried to get superior materials than were specified, and that he made a practice of rejecting the first consignment of materials of any class brought on to the ground, in order to get better qualities. When asked about this in the witness-box, Poole said he did not make a practice of it; but he did not deny it, and from the evidence admitted he (the Official Referee) believed Poole was in the habit of objecting to every facing brick till he thought that he could not get a better one from the contractor, but in that Harston supported him, and the board of guardians could not be held liable. Another charge against Poole was that he crossed off or condemned brickwork wholesale when in a temper, and this was supported in one instance by no fewer than six reliable witnesses. Poole admitted that he did mark some with a small pencil, and that he could not have got into a temper over it, as there was no entry of such an occurrence in his diary! No one could believe that Poole did not lose his temper on that occasion. Poole also denied having ever used bad language; but he could not place implicit trust on the witness, judging from his conduct in the box. Indeed, he must say that Poole was one of the worst witnesses he ever heard. The marking off of window-sashes wholesale, which were eventually used, was conduct which could not be justified. It certainly constituted interference with the execution of the contract, but he was not prepared to hold the guardians responsible for all these things. He did not

base the case against the guardians on the actions of Poole, but on the deliberate failure to give the contractor possession of the building site, rendering it impossible to complete the work at the specified time. Such failure might in some case simply involve the payment of penalties; but in a job of this magnitude, where it was of the greatest consequence that the builder should be able to carry out the work altogether, the result of the delay was that he lost time in the first three or four months which he never regained; men were kept idle whose labour could not be utilised for other purposes; materials were ordered before they could be used, and had to be stored, and in the case of timber were damaged, and in effect the work cost very much more from the wrong way in which it had to be carried out. This he felt was sufficient to enable him to say that such treatment absolved the contractor to a certain extent from completing by the appointed time, and to that extent he could claim damages—almost the same measure of damage as if the contract were brought to an end, and he would sue for the value of the work done. In the present instance there was no evidence on which he could rely to show what the work actually cost. The plaintiffs' books had been inspected by the guardians, but they might take it, he thought, that the sum due was very much in excess of the contract price; indeed, he did not think that it was less than 45 per cent. above the money expected to be paid on the contract, or nearly half as much again—certainly an enormous amount. He could not find that it could be said of Brooks, or Fearon, or the trustees, that they did not try to supply proper materials, and, indeed, it was not even suggested that they did not go to the right places for the materials. Some of the materials rejected ought not to have been condemned, and the contractor ought not to be visited with blame on that score. That being so, judgment ought to be held to be in favour of the plaintiffs; but there was one further point to be considered. It had been suggested by Mr. English Harrison for the guardians that plaintiff acquiesced in the existence of the contract long after the breaches had arisen, that he had submitted to be paid by the certificates of the architect under that contract, and that, therefore, he and his trustees had elected to be bound by the provisions of this contract; but that argument did not apply if the contract was at an end, and the work had to be valued on a *quantum meruit*. He did not say in what respect the guardians had altered their position with reference to the contract; but the same point arose in the case of "Bush v. the Trustees of the Port and Town of Whitehaven," decided in 1888 by Mr. Justice Cave, and upheld on appeal. In that case the contractor acted similarly—viz., he accepted the decision of the architect, and got the money under the contract on the architect's certificates, and the Court decided he was entitled to say that he had got all the contract gave him, but was entitled to something more. In this case, therefore, he should follow the ruling of Mr. Justice Cave. For these reasons, there ought, he thought, to be judgment for plaintiffs against the guardians; there must be a judgment for the architects, with costs. With regard to the latter point, he had thought at one point that Messrs. Harston, although they would get judgment in their favour, ought not to be awarded their costs; but after hearing the evidence of Mr. C. Harston, he considered that to deprive them of costs would be taking a stronger step than he had a right to take. He had expressly stated what he thought of what Mr. Harston had done under this contract; but he thought that he should not be justified in exercising the discretion which he possessed in saying that he ought to pay the costs of the action which had been brought against him. The guardians must pay the costs of Brooks and his trustees, but the amount as to which judgment should be entered against the guardians for the work carried out in excess of that paid for must remain undecided, because he (the learned Referee) had not had the opportunity and had not endeavoured at present to arrive at a precise sum. He had thought it right in this rather exhaustive inquiry not to try and find out at present what the damages were, and he hoped that, whatever course the parties might take in coming to a decision on this point, they would not deem it necessary to enter upon another inquiry, but would be able to adopt some plan which would not involve the necessity of more money being spent in litigation. If there were an appeal in the matter, the question would not arise unless his judgment stood, and in that case he trusted it would not be necessary to hold a further inquiry and a further expenditure of money. He felt sure that the guardians would realise their duty to the public in this respect.—Mr. Harrison said he did not know whether the learned Referee had set aside the contract or not. If it were set aside, of course his clients (the guardians) would like a little time to consider what they would do. It could not be a sort of double-edged inquiry where the question of damages was concerned. If the contract were to be set aside, plaintiffs would be entitled to the *quantum meruit*. The Official

Referee said he regarded the contract as having been set aside; but if not, he could not quite make out what the difference in the damages would be. Mr. Harrison replied that if that were so, and the learned Referee decided that the contract was set aside, he must request him to formulate his judgment, and give his clients a few days to consider it, because with regard to the *quantum meruit* the guardians would like to take it further. The Official Referee: By all means; I will give you a stay of execution for 14 days. Mr. Harrison said he wanted something which he could deal with at once; he believed he could get a decision very soon. The setting aside of the contract was a very serious matter for his clients. Mr. Bray, for plaintiffs, said that what he understood the judgment to be was that the contract was set aside, and that the plaintiffs were entitled to a *quantum meruit*; and if they were not entitled to that, they were entitled to damages, which had to be determined at a future time. The Official Referee explained that he should put in his formal judgment that he thought that the plaintiffs were entitled to substantial damages. After some further discussion, in which Mr. MacIntyre, representing the architects, also took part, the Official Referee directed that judgment should be entered for the plaintiffs as against the guardians, with costs, the damages to be ascertained hereafter, and the judgment should be entered for the architects as against the plaintiffs, with costs. Stay of execution granted for 14 days to enable the guardians to decide whether they should appeal.

RE FRANCIS MORTON AND CO., LTD.—The Receiver and Committee consider it desirable, having regard to negotiations which are now pending, that the adjourned meeting of creditors should be further postponed, and therefore advised that there should be no meeting on Tuesday last, the 16th inst. Due notice will be given when the next meeting of creditors is fixed.

A DISPUTED BUILDING CONTRACT.—GEORGE MULHOLLAND v. E. H. KESSEN.—At the Manchester Assizes last week, this action was brought to recover £154 17s. for work and labour done. The plaintiff was a builder at Southport, and the defendant was a gentleman residing at Sale, and the claim was in respect of the part erection of two houses at that suburb. The plaintiff had contracted in March to complete the houses by the 24th of June, 1896, but a dispute arose between the parties, and the contract was annulled when the houses were two-thirds completed. The defendant had put an end to the contract, although the plaintiff was ready and willing to carry it out. The claim was for the balance of account due. The defendant, however, had got other people to complete the houses, which had been done at greater expense than if carried out by the contractor, and he had asked from the plaintiff a larger amount for completion of the contract than the sum which formed the subject of the claim. Mr. Byrne, for the defence, said the plaintiff had agreed to the terms of the contract, had accepted his discharge, and acted upon it. He ought to have waited until the houses were completed and the cost ascertained before he brought his action, but he had commenced proceedings a day or two after his discharge. The plaintiff had used spruce instead of deal without the defendant's knowledge or consent. There were also faults in the houses in various places, and the drainage had not been completed. The walls also bulged. The defendant gave evidence in support of the statement of counsel. Ultimately the jury gave a verdict for the plaintiff for £15. Judgment accordingly.

GLASGOW BUILDING REGULATIONS.—A decision of considerable interest to builders in Glasgow has just been given by the Glasgow Dean of Guild Court. A petition was presented to the Court by the Procurator-Fiscal against Archibald Stewart and Co., builders, Glasgow, that they had failed to comply with a notice served upon them by the Master of Works to hinge or construct the windows of dwelling-houses in a tenement erected by them in Garnagad-avenue, so as to admit of the outsides of the windows being cleaned from the inside of the apartments. Messrs. Stewart objected that the by-law of the Glasgow Building Regulations Act, 1892, upon which the petition was founded, was *ultra vires* and incompetent. The decision of the Court is that the by-law is invalid so far as it requires "that in dwelling-houses all window sashes above the ground floor shall be hinged or constructed so as to admit of the outsides of the windows being cleaned from the inside of the apartment"; and that it was *ultra vires* of the Glasgow Police Commissioners to enact a by-law to this effect; and therefore finds it is not necessary for the respondents to execute the work specified in the notice of the Master of Works.

The Wheatley Schools, Doncaster, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.









Ground Floor Plan





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BRACKETS.—NEW OFFICES, BRISTOL.—THE NEW PALACE  
THEATRE OF VARIETIES, SYDNEY, N.S.W.

## Our Illustrations.

## ANIMALS IN SILHOUETTE.

THESE studies from nature, made in the Zoological Gardens, Manchester, obtained a National Bronze Medal at the last Students' Competition at South Kensington. Mr. Philip W. Smith, of the Manchester School of Art, is their capable author, and we gather that his studies were influenced by the late director of that institution, Mr. Walter Crane. However this may be, it is perfectly evident that Mr. P. W. Smith is an exceedingly capable draughtsman, and his silhouettes furnish some admirably suggestive designs, which capitally realise the characteristics of the beasts and birds selected for illustration, and so can hardly fail to be useful in more ways than one to our readers.

## ST. SAVIOUR'S, SOUTHWARK.

ON Feb. 19, a day or two after the reopening of this great church, we gave several geometrical drawings, with a view, delineated by the architect of the new nave, Sir Arthur Blomfield, A.R.A.; to-day, we publish another and more detailed perspective by the same accomplished hand, illustrating the south transept as now completed. The central tower forms a most conspicuous feature in the picture, crowning the church, as it in reality does, with grace and dignity. A small key elevation in the margin of our plate exhibits the former but modern façade of the transept put up in 1822, and now happily demolished.

## KENNINGTON ROAD BATHS.

THE accompanying illustration represents the above new buildings as now being erected at the corner of the Kennington and Lambeth roads, from the design, and under the superintendence of, Mr. A. Hessel Tiltman, F.R.I.B.A., 6, John-street, Bedford-row. The accommodation is as follows: men's first-class swimming-bath, 143ft. by 57ft., clear size of pond, 132ft. by 40ft.; men's second-class swimming-bath, 100ft. by 43ft., clear size of pond, 90ft. by 30ft.; women's swimming bath, 65ft. by 40ft., clear size of pond, 56ft. by 25ft. There will be 19 first-class slipper-baths for men and 46 second-class; 11 first-class slipper-baths for women and 20 second-class. In the public washhouse there will be arrangement for 64 washers. The men's first-class swimming-bath, which was the first to be sanctioned by the London County Council for use as a place of entertainment, will be arranged so as to be thoroughly adaptable for this purpose, and it is, moreover, entirely set off from the main establishment. Space has been left for a second swimming-bath for women of some considerable size, with possibilities of the extension also of the slipper-baths. This establishment, when completed, will contain all the latest of Mr. Tiltman's arrangements and contrivances for public baths

and washhouses, and the establishment itself will share with the Hornsey-road baths (by the same architect) the credit of being the largest establishment of its kind probably in Europe. The whole of the buildings will be lighted by electricity generated upon the premises. The materials used are: facing bricks by Mr. James Brown; carving and other ornamental brickwork in red brick rubbers; skylights in Rendle's patent glazing; cupolas on the top of towers covered with copper; and the boundary dwarf wall and piers in red salt-glazed bricks, with ornamental railing.

## VENETIAN BRACKETS.

FEW details in masonry furnish a more admirable opportunity for good design than brackets and consoles, and none probably are more often mismanaged or over-elaborated in modern design. Their failure, for the greater part, is due to the absence of simplicity in outline and lack of delicacy in ornamentation. These studies, by Mr. H. V. Lanchester, of Venetian and Italian brackets, which we print to-day, furnish good examples of their kind, and being drawn with so sincere a regard to accuracy, well merit a place as samples of interest for reference.

## OFFICES, BALDWIN STREET, BRISTOL.

THIS building is now being erected by Mr. A. J. Beaven, from the designs of Mr. Edward Gabriel, on a prominent site in Baldwin-street, Bristol. It consists of four stories and basement. Externally, the ground-floor is fine axed granite, the upper floors being in Ham Hill stone and bright red Cattybrook bricks; internally, the ground-floor is designed to accommodate two important Insurance Companies, with separate entrances, whilst the remaining floors are devoted to suites of offices. All the floors are of fireproof construction, and will have wood-block flooring. There are strong-rooms and lavatories on each floor and other conveniences. The joinery and flooring of ground-floor will be in teak. The estimated cost of work, including cost of site, is £13,000. The architect is Mr. Edward Gabriel.

## THE NEW PALACE OF VARIETIES, SYDNEY.

(For descriptive article and further illustrations see pp. 408-9.)

The Local Government Board have sanctioned the application of the Heywood Town Council for power to borrow £35,000 for the purpose of the water undertaking. The scheme was vehemently opposed by the town council of the neighbouring borough of Middleton.

The Aberdeen Parish Council unanimously resolved last week to proceed with the erection of new offices on a site in Union-terrace, to afford increased accommodation for the business of the council, which is at present transacted in the old Parochial Board premises in Castle-street. The new offices will cost £6,000. The price of the site was £3,700, making a total expenditure of fully £9,000.

At a special meeting of the Liverpool Master Builders' Association, held at 6, Lord-street, Liverpool, on the 4th inst., the question of sending in priced quantities with estimates was under consideration, and after a general discussion it was unanimously resolved that the members of this association should not send priced quantities in with their estimates.

Tenders are invited for the construction of the new harbour works at Ostend. Tenders will be opened on April 17, at Bruges, at the offices of the provincial government, and the plans and estimates of the works may be consulted at the Musée Commercial, at Brussels. Such further particulars as have been received may be seen at the Commercial Department of the Foreign Office any day between 11 and 6.

The President of the Royal Academy (Sir Edward J. Poynter) will be presented with the honorary Freedom of the Painter Stainers' Company, and made a member of the Court at the Hall, Little Trinity-lane, on Wednesday, the 7th of April.

Mr. F. H. Tulloch, an inspector of the Local Government Board, has held an inquiry at Bath, as to an application of the corporation for compulsory powers to purchase land and houses for carrying out an improvement in widening and altering the gradient of London-street. Mr. Fortune, city surveyor, and Mr. Moore, assistant engineer to the G.W.R. Co., who had been consulted, produced plans. There was no opposition. Another inquiry had reference to the proposal of the authority to borrow £7,500 for the construction of a new river wall, in the Dolemeads. There was no opposition in this case.

## COMPETITIONS.

SEVENOAKS.—At the Monday's meeting of the urban district council it was reported that the sub-committee appointed to examine the numerous plans and specifications received for the erection of workmen's dwellings, had, after careful deliberation, reduced the number to three. They now recommended that these designs be referred back to a committee of the whole council, with a view to their deciding to whom the prize of £5 should be granted. This was agreed to.

## CHIPS.

An inquiry regarding the proposed purchase of Stirling Gasworks by the Commissioners of Stirling was heard throughout last week, in the Windsor Hotel, Edinburgh. The town offered £61,130 for the works, but the Gas Company demanded £68,320, and parties decided to refer the question of price to Sheriff Lees as sole arbiter.

On Saturday week the foundation-stone of an adult school, in connection with the Friends' Meeting House, was laid at Doncaster. The new school is to be built behind the Friends' Meeting House, and adjoining the cemetery, and will cost about £700. The architects are Messrs. Allman and Beck, and the builders Messrs. Gill and Son.

The Lord Provost's Committee of the Edinburgh Town Council have instructed Messrs. Williamson and Scott to proceed with the preparation of working plans for the corner blocks of buildings in North Bridge-street. Failing satisfactory offers being received from outside parties, the committee will undertake the work, estimates for the work being obtained meantime.

At St. Austell, on Monday, a fatal accident occurred at the Trenance Viaduct, now being rebuilt for the Great Western Railway Company by Messrs. Relf and Son. A workman named Marsh, who was engaged on the crown of one of the arches, took a false step, and fell about 100ft. on the granite rocks, and was instantly killed. He leaves a wife and infant child.

During excavating operations in connection with the storm-water drainage, in the High-street of Strood, the workmen came across a portion of the old Roman road, which ran through near to where the work is proceeding. Large stones, considerably worn, and forming part of the road, have been thrown out during the week.

The engineers of the Northern Lighthouses Commissioners are at present engaged in surveying the ground at Blackhead, three miles north of Portpatrick Harbour, where it is proposed to erect a new lighthouse and fog-signal station for the Irish Channel, to serve as an intermediate light between Corsewall Point and the Mull of Galloway, the lighthouses of which are 25 miles apart.

A donation of £3,000 by Sir George Williams, the father of the curate in charge of the Emmanuel district of St. Thomas, Exeter, has greatly advanced the scheme for erecting a permanent church in that neighbourhood. The building committee had already raised about £2,700, whereas £6,000 was required to provide the structure of the church without the tower, while the heating, lighting, &c., will probably run into another £1,600 or £1,700. The church extension committee met on Friday, and instructed their architect, Mr. Breakspere, to proceed with the detailed plans with the view of inviting tenders.

Mr. W. Wallace Gandy, architect and surveyor, St. Helen's, has just been appointed chief architectural assistant to the borough engineer of Accrington. There were 140 applicants for the position.

The City Commission of Sewers resolved on Tuesday to pave the carriage-way of Upper Thames-street with Australian hardwood at a cost of £2,550.

A new county police-station has just been erected at the corner of Plough-row and Church-street, Wellington, Salop. It is Italian in style, and is built of red bricks with moulded stone dressings. Mr. A. Roper, of Wellington, was the contractor, and the work has been designed and superintended by Mr. A. T. Davis, the county surveyor.

At Liskeard, on Tuesday, Henry Blewett, the foreman, and Samuel Pearce, the ganger, against whom the coroner's jury had returned a verdict of manslaughter, by reason of negligence in connection with the collapse of a platform at the Coldrenick Viaduct, near Liskeard, were brought before the magistrates. The chief engineer said that Pearce had selected defective beams as supports, and that had Blewett used supporting chains under the platform the disaster would not have occurred. Mr. Gibbons, divisional engineer, Mr. Lloyd, assistant engineer, and several workmen disposed that Blewett had received no special instructions, and had followed the usual practice. The magistrates dismissed the charge.

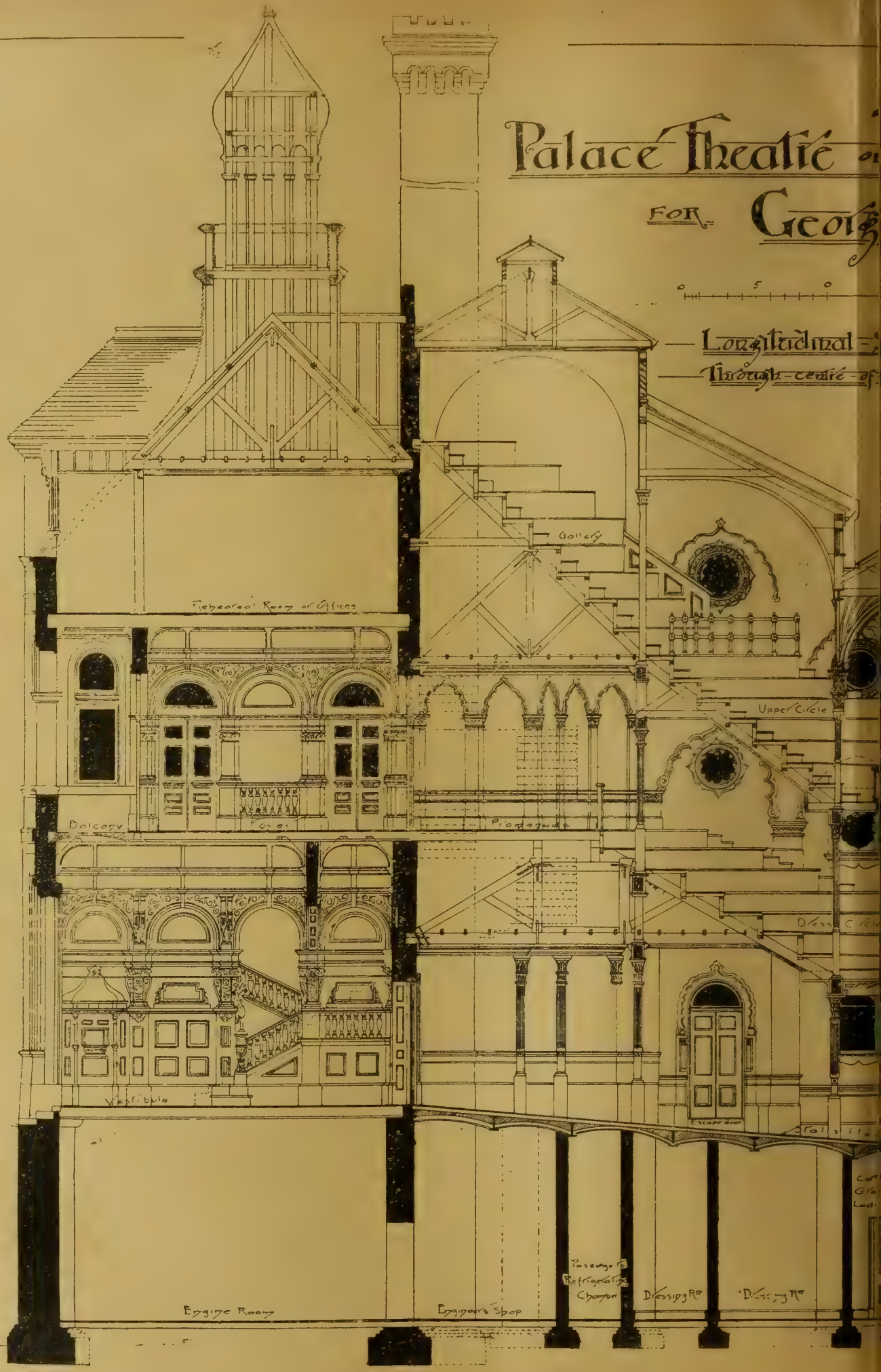


# Palace Theatre

FOR GEORGE

0 5 0

Longitudinal -  
Through - centre - of





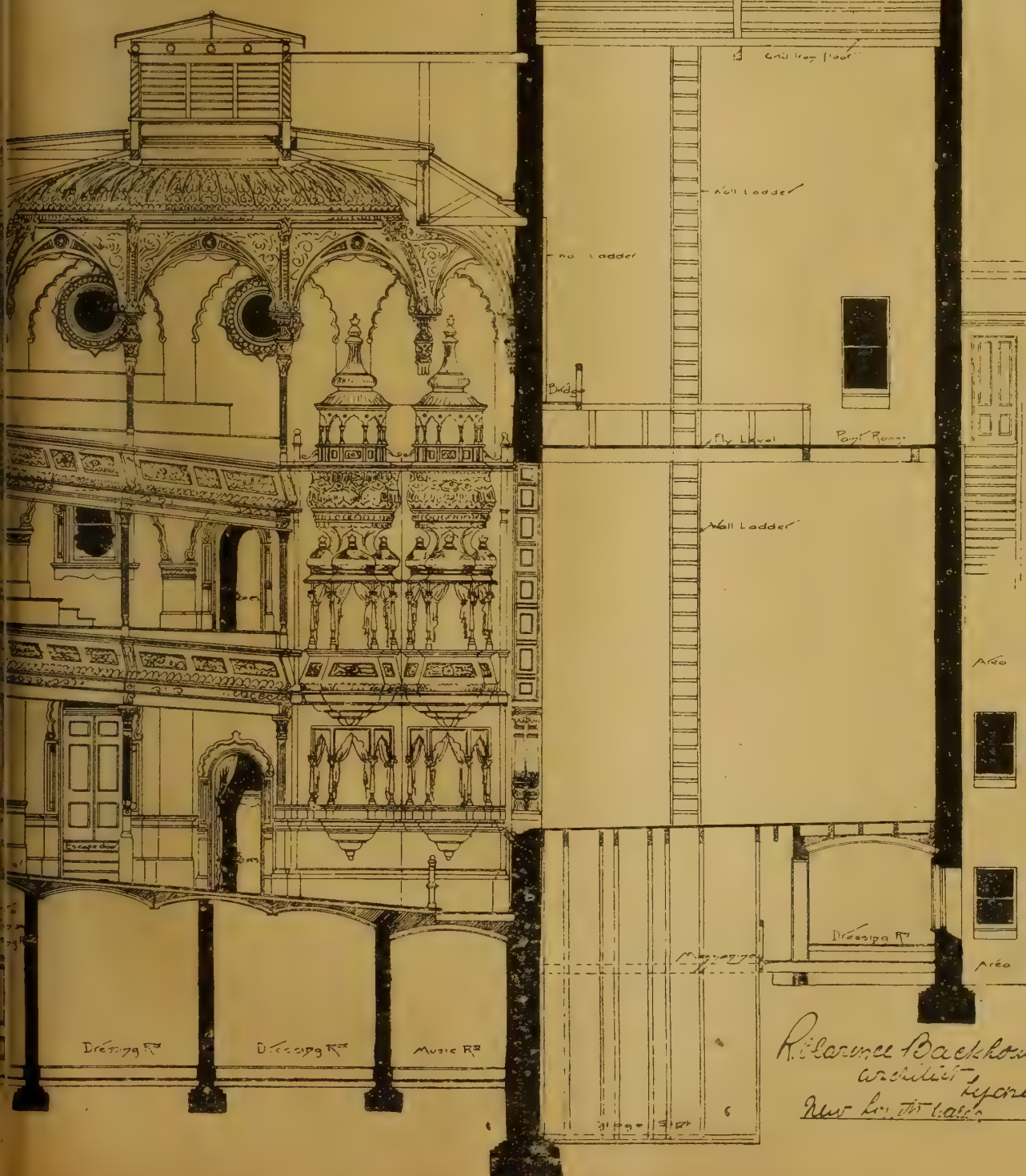
# Varieties Pitt St Sydney

## Adams Esquise

10 20 30 FEET

Section

Adams





## OBITUARY.

THE death is announced of Mr. ALFRED CHARLES BROCKHANK WILLIAMS, of Johannesburg, as having taken place after a brief illness, the second week in February. Mr. Williams was elected a member of the Society of Architects in 1889, and for some years has acted as local hon. secretary in the Transvaal to the Society.

The Links and Parks Committee of Aberdeen Town Council have recommended that the bathing station should be considerably extended. The cost of the additions is estimated at £6,000.

Mr. Henry Blackburn, the originator and editor of "Academy Notes" and "New Gallery Notes," and the author of a number of works on art and travel, died on Tuesday week at Bordighera, on his way back to England from Rome. Mr. Blackburn, who was born in 1830 and formerly held an appointment in the Civil Service Commission, had been known for many years as an art critic and lecturer.

The Bishop of Southwell reopened on Friday the parish church of Edwinstowe, on the borders of Sherwood Forest. The work of restoration, which has been carried out by Messrs. Hy. Green and Sons, Nottingham, comprised the entire re-roofing of the nave, aisles, and chancel—the nave and south aisle being raised a few inches—and the removal from the interior walls of the plaster which disfigured them. The work has entailed an outlay of about £1,800.

There will be opened to the public to-morrow (Saturday), in the Marlborough Room of the Walker Art Gallery, an exhibition of Indo-Persian pictures and manuscripts. These are principally of the 15th, 16th, and 17th centuries, and are the work of native artists. The collection, which has been formed by Colonel H. B. Hanna, has been loaned for three years. An example of the work of the late W. Huggins, "Christian and the Lions," bequeathed to the corporation by the late Herbert Grundy, of Manchester, is now hung in the gallery.

At a meeting of representative inhabitants of the parish of St. Mary Abbott's, held at the Kensington Town Hall on Monday night to consider the celebration of the Queen's reign, a scheme, proposed by the chairman (Mr. T. W. Wheeler, Q.C.), was adopted. The proposal is to acquire the slum and insanitary area of the parish, and gradually to build blocks of working-class dwellings, so that the poorer classes will not be driven away, but housed somewhat on the lines adopted by the administrators of the Guinness Trust. The scheme also includes provision for libraries, and common rooms where the residents can meet. A representative committee was appointed to elaborate and formulate Mr. Wheeler's proposals and to report to a future meeting.

A new church and schools, which are being erected on the Parade, Parkgate, Wirral, according to the plans and under the superintendence of Messrs. Frederick Fraser and Warburton, architects, Warrington, are making rapid progress towards completion, and the church will be opened about Easter. The cost of the building is estimated at £9,000. Further extensions to the schools are contemplated over the above sum, and the architects are preparing plans. These include the erection of a large covered playground, roofed in a single span of 100ft. The new dormitories will be of fireproof construction throughout. The alterations also include the pulling down and rebuilding of the whole of the front to the river Dee. The contractor for the work is Mr. Wm. Fleming, of Neston.

The report for March of the Labour Department states that the labour market has continued to improve during February, the coal, iron, and steel industries being more fully employed, and the percentage of unemployed members of trade unions in most important groups of trades showing a decline. In the 115 trade unions making returns, with an aggregate membership of 451,544, 3.0 per cent. are reported as unemployed at the end of February, compared with 3.3 per cent. in January, and with 3.8 per cent. in February, 1896. Employment in the building trades has improved. The percentage of unemployed in unions making returns for February was 2.0, compared with 2.4 in January and 2.5 per cent. in February, 1896. In the furnishing trades employment has improved, and is now good. The percentage of unemployed union members was 3.0 at the end of February, compared with 5.1 in January and 2.6 per cent. in February of last year.

The site for the Grand Central Hotel to be erected in Marylebone-road, London, in front of the terminus of the Manchester, Sheffield, and Lincolnshire Railway extension to London, is now being cleared, and building operations will be forthwith commenced. The new hotel will, it is said, be on the same scale of magnitude as the Midland Grand Hotel in Euston-road.

## Building Intelligence.

**TRURO CATHEDRAL.**—A meeting of the general building committee of Truro Cathedral was held on Friday, at which a report by the executive committee was read, recommending that the work of laying the foundations of the nave of the Cathedral be taken in hand with as little delay as possible, the hope being entertained that the building of the nave itself may be begun early next year. It was stated that a sum of £23,000 was in hand or had been promised. The Bishop of Truro said that as it would take a good many months to lay the foundations of the nave, he concurred in the opinion that the work might be begun. The minimum sum required for building the constructive part of the nave was £25,000, and if they added the west front they would require a considerable sum in addition. The recommendation of the executive committee was adopted; and it was decided that if sufficient money was not subscribed before the end of the present year to justify the building of the nave, the work should be proceeded with as early as possible next year.

**WAKEFIELD.**—At the quarterly meeting of the West Riding County Council the General Purposes Committee reported that the cost of the new county offices at Wakefield had been £108,543. The architects, Messrs. Gibson and Russell, of London, having made a request for further remuneration by reason of additional and extra work in and about the buildings, superintending the painting and decorating, and other work, the committee recommended that the architects' remuneration be increased from £3,200 to £3,800, such increased remuneration to include all charges for completing the buildings other than the provision of the fittings and furniture. A resolution to this effect was moved by Mr. Mackie, who explained that the recommendation was a compromise arrived at with the architects, who originally claimed a commission on all extra work. The granting of an additional £600 would make the commission paid to the architects about 4½ per cent., the usual commission charged being 5 per cent. The resolution was carried. The committee further recommended that Messrs. Gibson and Russell be employed to superintend the work connected with the fitting-up and furnishing of the offices, the fees to be paid to them to be 5 per cent. on the outlay, provided that the total fee should not exceed £600. This recommendation was adopted.

## CHIPS.

A Local Government Board inquiry will be opened at Coventry to-morrow (Saturday), by Colonel Hasted, into an application by the City Council for sanction to borrow £156,000 for sewage-disposal purposes, and £14,571 for rebuilding and enlarging the magisterial court, the police station, and cells.

The town council of Douglas, Isle of Man, has raised the salary of their borough surveyor, Mr. Taylor, from £170 to £200 a year, and also that of his assistant, Mr. Clucas.

At the Guildhall, Lincoln, on Tuesday week, Mr. W. O. E. Meade-King, Local Government Board inspector, conducted an inquiry touching an application by the City Council for sanction to borrow £3,500 for works of wood paving.

Chelmsford Town Council have decided upon a free library, with a museum attached, as a commemoration of the Diamond Jubilee. The Mayor (Ald. Frederic Chancellor, F.R.I.B.A.) offered a site and a donation of £250 towards the cost.

At the meeting last week of the Dorsetshire County Council the completion of the new lunatic asylum for the county was reported, it being stated that the total cost had been £85,000.

For the window in memory of Oliver Goldsmith, proposed to be placed in the church of which at the time of his birth his father was curate, a design by Messrs. Watson, of Youghal, has been selected. The requisite funds having been subscribed, the work is about to be carried out.

Mr. Charles P. Cotton, M.Inst.C.E., Chief Engineering Inspector of the Local Government Board, held an inquiry in Belfast on Wednesday week regarding a petition presented by the corporation, praying that a provisional order may be made confirming an improvement scheme with regard to James's-court. The proposal is to clear away some insanitary houses, and to open a street on the site of James's-court between Carrick-hill and Trinity-street.

The late Sir Thomas Elder has bequeathed £155,000 for public objects in Adelaide, including £65,000 for the University, £25,000 for a picture gallery, and £25,000 for workmen's homes on the lines of the Peabody Trust.

A new school, erected by the Pannal School Board at Otlands Mount, near Harrogate, was opened on Monday week. The school, including site and furnishing, has cost about £6,000, and accommodates 500 children. The architect was Mr. Buttery, of Morley.

Mr. William Spinks, lecturer on sanitary engineering, Yorkshire College (Victoria University), has been elected President of the Institute of Sanitary Engineers (Incorporated) for the ensuing year. The membership of the Institute now numbers over four hundred and sixty.

The urban district council of Tonbridge have decided to purchase the ruins of the Castle and the grounds in which they stand for £7,850. They probably will be used as a park and recreation grounds, and the council chambers and offices will be transferred to the Castle.

The Liskeard Board of Guardians adopted, on Saturday, plans by Mr. Sansom for an infirmary to be added to the workhouse, at an estimated cost of about £3,000.

The Duke of Portland on Saturday laid the memorial stone of new elementary day schools which are being erected, at a cost of about £4,000, to meet the educational requirements of Whitwell, a rapidly growing village about three miles from Welbeck Abbey.

A north aisle has just been added to the Church of the Holy Sepulchre at Ashington at a cost of between £800 and £900. The original design, prepared by Mr. W. S. Hicks, of Newcastle, provides for a nave with north and south aisles, separated therefrom by two arcades of five pointed arches resting on octagonal piers with moulded bases and caps; chancel, porch, and tower. The estimated cost of the nave, chancel, and aisle now erected amounts to about £2,500. The plan will be carried out in its entirety when the necessary funds are raised.

The first sod was formally cut on Friday of a new Conservative clubhouse at Heaton Park, Prestwich. Mr. Lodge, of Manchester, is the architect, and the cost will be £1,000.

At the York Consistory Court, on Friday, faculties were decreed to erect a new south aisle to the church at Heeley, near Sheffield; also to insert stained glass in a window in the south choir aisle of Selby Abbey Church.

At the annual meeting of the Royal Birmingham Society of Artists, on Saturday evening, Sir E. J. Poynter, P.R.A., was elected president in succession to Mr. Alma-Tadema, R.A., whose term of office had expired.

A meeting of Glasgow citizens, convened by the Lord Provost, agreed, on Friday, to commemorate the 60th year of the Queen's reign by largely reconstructing the Glasgow Royal Infirmary, now 105 years old. At the meeting subscriptions amounting to £15,000 were received.

Wednesday week saw the completion of the boring of the tunnel of the Exeter and Teign Valley Railway through the hill at Perridge. The tunnel at Culver was completed the previous week. The railroad from Lea Cross to the tunnels was made some time since. The contractors, Messrs. J. and J. Dickson, are now within three and a-half miles of the junction with the Great Western Railway at St. Thomas, and now have nothing but easy work before them.

Alterations are being made to the town hall, Bideford, and special consideration has been given to the ventilation, which will now be carried out on the Boyle system.

The work of rebuilding the north-west gable of Peterborough Cathedral has now been begun. Already two courses of the archway have been replaced, and the whole will be rebuilt in about six weeks. The gable will, of course, be perpendicular, while the other two will continue to lean forward, but this will not be noticed except at a side view.

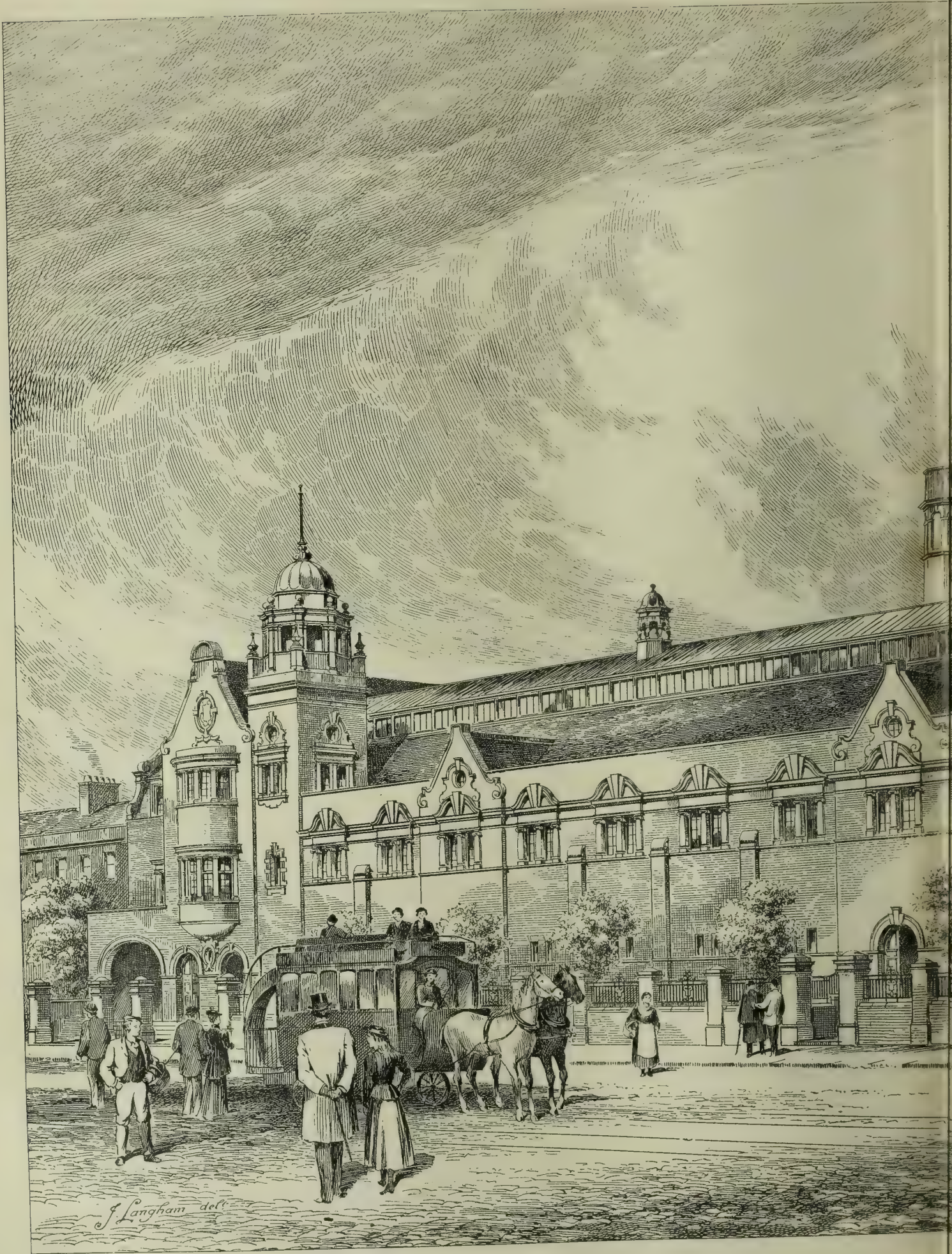
Mr. John Gabe, builder, Thomas-street, Merthyr, died on Tuesday week at his residence. Some years ago the deceased, who was 84 at the time of his death, took an active part in the public life of the town, having been a member of the board of guardians and of the old local board of health.

At Hessele, in the East Riding, a new parish hall was opened on the 11th inst. The larger central room has seating accommodation for 600, with stage and dressing-rooms. The floor is of pitch pine, and laid for dancing. There is also a council-chamber to seat 150, and a smaller room for private meetings. Caretaker's rooms and cooking kitchen are provided. The building is of red stock bricks, with stone facings. The architect is Mr. W. A. Gelder, of Hull, and the contractors were Messrs. Marsden. The cost has been under £3,000.









PUBLIC BATHS & WASHHOUSES KENNINGTON



MAR. 19, 1897.



Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

ROAD · LAMBETH · A. HESSELL TILTMAN FRIBA ARCHT





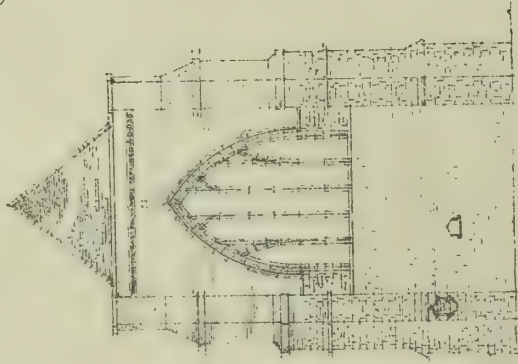






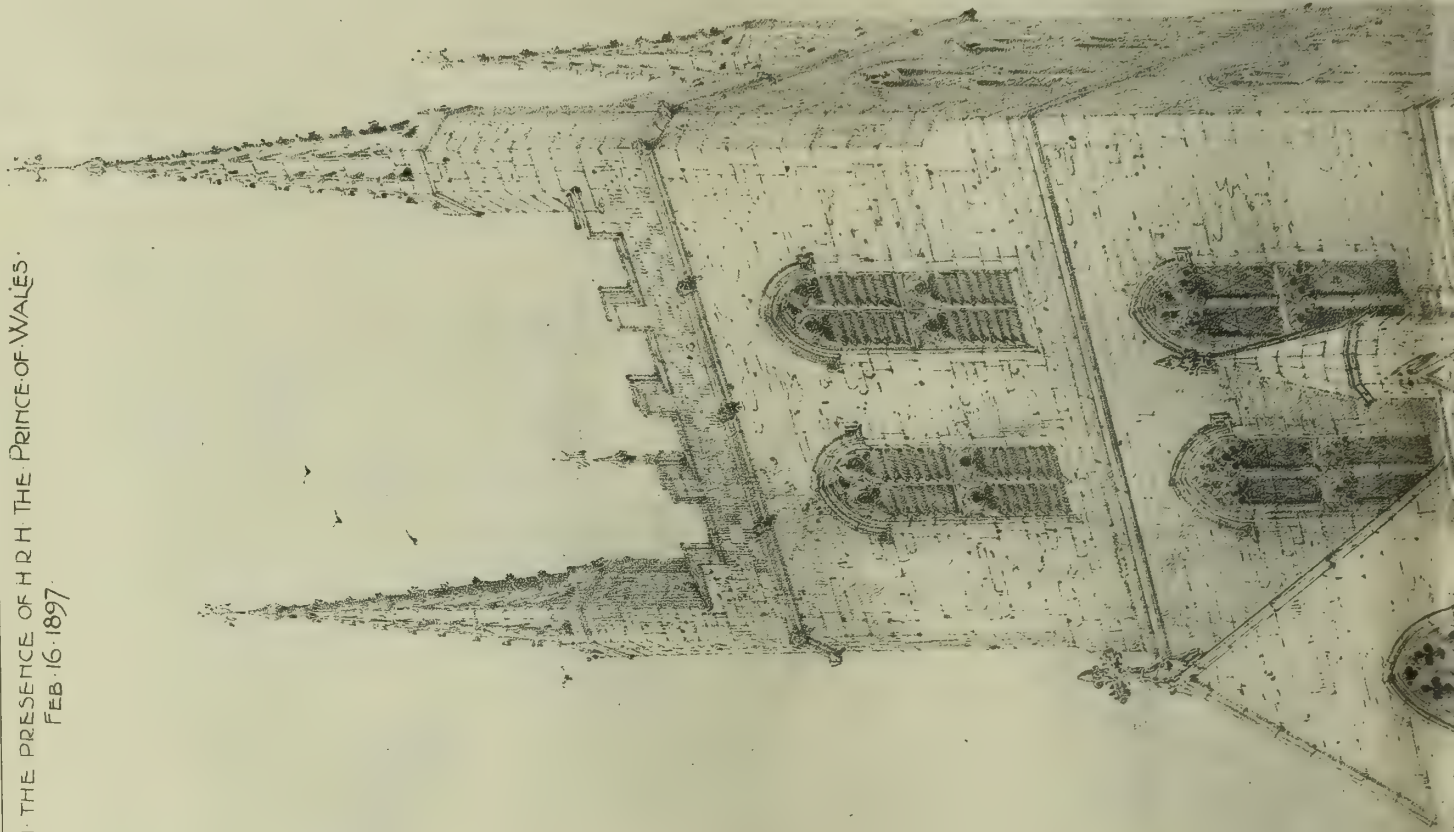
THE BUILDING JEWS, MAR. 19, 1897.

OPENED IN THE PRESENCE OF HRH THE PRINCE OF WALES.  
FEB. 16, 1897.

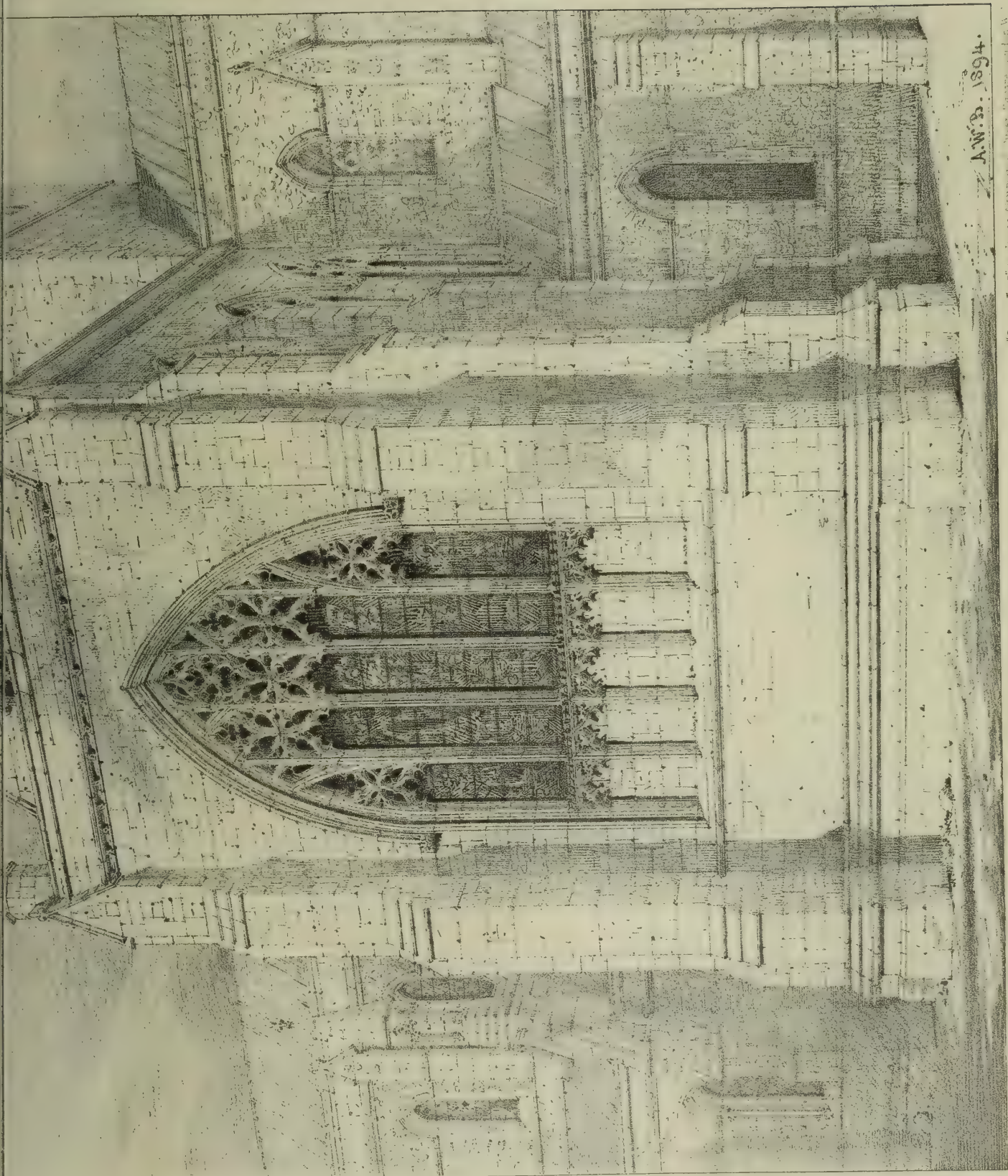


SKETCH SHEWING SOUTH TRANSEPT.  
IN 1822.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100







A.W.B. 1894.

"PHOTO-TINT" BY JAMES ADAMS & SONS, LONDON AND L.E.W.

ST. SAVIOUR'S CATHEDRAL CHURCH, SOUTHWARK. SIR A. BLOMFIELD, ARCHT. & SONS, ARCHT'S.



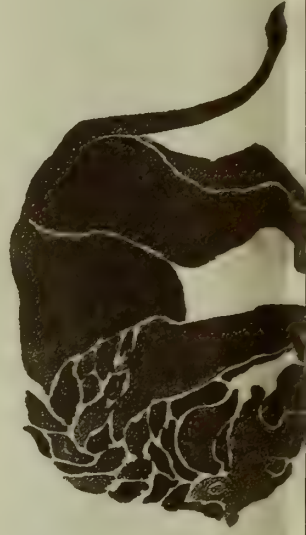








TRANSLATIONS  
INTO SILHOUETTE  
OF  
STUDIES FROM NATURE  
AT THE  
ZOOLOGICAL GARDENS  
MANCHESTER  
NATIONAL BRONZE-MEDAL  
DRAWINGS  
BY PHILIP W. SMITH











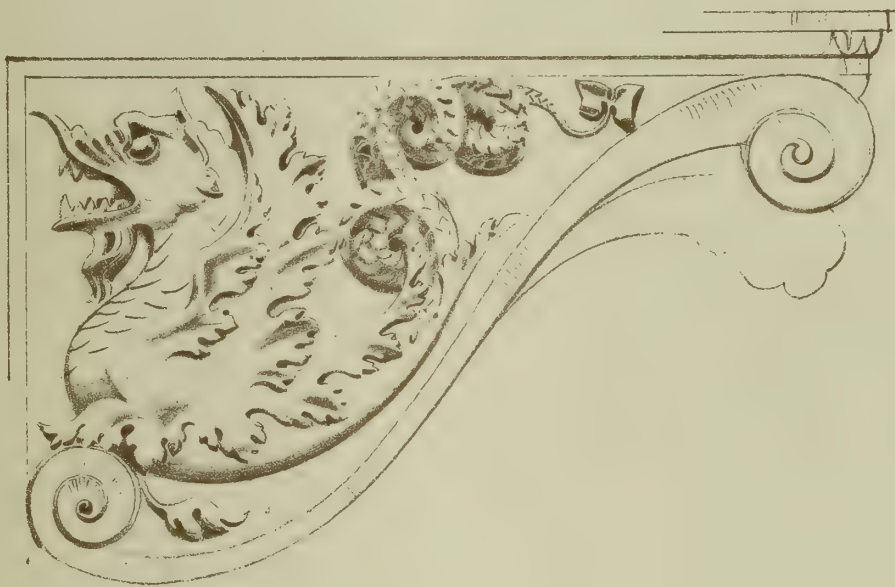


S.K. MUSEUM



BRACKET ITALIAN

16 CENT.



VENETIAN

BRACKET OF CHIMNEY PIECE

EARLY 15<sup>th</sup> CENTURY

SKETCHES BY H.V. LANCHESTER







## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risk, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

## TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

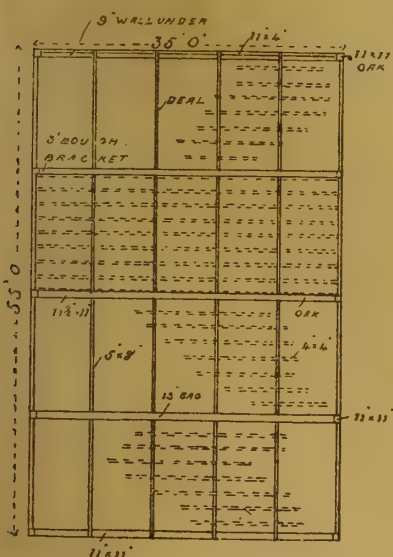
The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## Correspondence.

## A CURIOSITY OF SLIGHT CONSTRUCTION.

To the Editor of the BUILDING NEWS.

SIR,—The inclosed sketch shows a curiosity of slight construction, which may be of some interest to your readers. It is the plan of the floor (once very much in favour on account of its springiness) of the old Assembly Hall on the Western Shore,



Southampton. Considering that the five oak beams (11in. by 11in.) have a clear unsupported bearing of over 26ft., with 3ft. more at each end on natural oak-bough brackets, the springiness is not surprising. The floor is carried by ten oak posts, 11in. square, 7ft. 9in. high, most being in very sound condition.—I am, &c., A. G. P.

Messrs. Peter Conacher and Co., organ builders, of Huddersfield, have just completed, at a cost of above £1,000, a three-manual organ, with 34 speaking stops and nine couplers, for the Roman Catholic Church of St. Mary's, Cork.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—C. W. G.—F. S. and Son.—E. L. Co.—R. A. G. H. (Tiverton).—S. S.

## "BUILDING NEWS" DESIGNING CLUB.

DESIGNS RECEIVED FOR COUNTRY HOUSE.

"CHARLEY'S AUNT," "The Wolf," "Look," "The Dingo," "Pickwick," "E. G.," "Mist," "Don't Know," "Cheese," "Ulan," "Pickles," "Nut," "Tyke," "Datum," "St. Leonard," "Geisha," "Pantile," "Agon," "Alfo," "Baron," "Too Much Trouble," "Percy," "Shield," "Triangle," "The Manxman," "The Mammoth," "Idrisiwyd," "Nap."

W. H. COLLIN. (The location of the surveyor's and clerk's offices is left to competitors; but the nearer they are to the public main entrance-hall the better. The hall entrance will be by way of the main entrance-hall. The small scale for the plans will enable an arrangement of elevations, &c., on one sheet to be made. If possible, they should be all on one sheet.)

ST. LEONARD. (See last answer.)

## Intercommunication.

## QUESTIONS.

[11637].—Arbitrations.—Will anyone versed in arbitrations kindly give me the name of a good standard work on this subject, with specimen awards, &c.?—JUROR.

[11639].—Stone.—Could any reader tell me what locality that a class of stone comes from that is recently being used for headstones and monuments? I have seen some of it in Oldham. I asked the mason, but he would not inform me. It is nearly white, shaded very faintly with a bluish cast. It is something similar to Kerridge stone, but rather softer; and if it is a large block, the ends are rather brownish.—STONE MASON.

## REPLIES.

[11634].—Old Exam. Papers.—These are to be obtained from Messrs. Eyre and Spottiswoode, East Harding-street, Fetter-lane, E.C. Long and careful preparation is essential to success, and an intending candidate should primarily assure himself that he is not likely to be disqualified as being physically unfit for service abroad.—G. A. T. MIDDLETON.

[11636].—Belgium.—If Mr. H. E. Davey will refer to the advertisement columns, under "Situations Vacant," he will see that I am organising a tour for sketching purposes to the places he mentions, excepting Brussels. Such large parties are commonly granted greater privileges than small ones, and the members work with greater advantages in all ways. An account of what the towns contain is to be found in Vol IV. No. 2 of the *Proceedings of the Society of Architects*, 1891.—G. A. T. MIDDLETON.

[11636].—Belgium.—Ostend contains nothing worth much attention, except the houses on the sea-front, generally rather coarse. Bruges has, practically, some old building worth examining in nearly every street. The best houses are to be found near the fish market, in the Place van Eyck, and in the Rue Queue de la Vache, the gates on the ramparts, and the guild house of the Société St. Sebastien, near the Porte de St. Croix. Damme, one mile N.E., should be visited on account of its Hôtel de Ville. In Ghent the finest brick houses are in the Marché aux Poissons and the Marché du Vendredi. Ypres being only a small town, it is hardly possible to miss the buildings most worth seeing. The church of St. Martin is the finest in Flanders. I may add that Baedeker is generally to be relied upon for mentioning the best buildings, and contains ample information concerning them.—HUBERT BODEN.

The Crown Hotel at Lyndhurst, which has been rebuilt and enlarged, is about to be reopened for the reception of visitors. Messrs. Jenkins and Son were the builders.

The 15th-century parish church of Nempnett, on one of the Mendip Hills, was reopened after restoration and the rebuilding of the chancel on Friday. The chancel has been rebuilt on a larger scale, and is separated from the nave by a carved-wood screen. On the north side is a new vestry. Mr. Buckle was the architect, and Mr. John Flower the builder, and the cost has been £1,600.

At the last meeting of the Birkenhead School Board, Mr. T. W. Cubbon, of Birkenhead, was appointed architect for new board schools to be erected in Well-lane, at the south of the borough.

On Wednesday week the foundation-stones of new chapel and schools were laid at Alrewas, Staffs. The new buildings, which are being built by Mr. R. Kershaw, of Burton-on-Trent, the contract price being £1,025, will be in the Early English style of red brick, with stone dressings. They will form a quadrangle, the chapel being connected by vestries with the schools. The chapel will seat 300 people, and the schools will accommodate 250 children.

## Our Office Table.

THE committee of the Town Council of Edinburgh, who are seeking a site for the proposed Usher Town Hall, have made the bold recommendation that the hall be erected on the north side of Charlotte-square. It is true the situation is central, and near the railway terminus and tramway lines; but a grave objection to its selection is that it would destroy a group of buildings designed by Robert Adam, and not only the finest example of his work, but the best and most harmonious specimen of domestic architecture in Edinburgh. Further, the proposal only to remove the seven central houses, leaving the end houses as they were, is absurd. Either the whole side of the square should be appropriated to municipal buildings, or another area ought to be chosen, and if the entire eleven houses are taken, the cost would probably be prohibitive.

On Saturday evening, Professor G. Baldwin Brown, of Edinburgh University, lectured in Moffat on "Modern Painting." Impressionism was, he said, really nothing new. It was practised by Velasquez in the 17th century, and it could be followed by two processes. By the analytic process the artist treated the different objects in a scene one by one, reproducing them as exactly as possible, or he could take the other process, and regard the scene as made up of so many patches of tone, colour, and light and shade, which he had correspondingly to reproduce. The analytic process led the artist to make the picture more complete than it actually was, and it became an explanation, distinguishing lines which were in nature obscure and colours which were blended. The second process enhanced the mystery of nature, and gave the appearance of things; while the analytic gave the representation of things. Impressionism did not dominate modern painting, but remained the ideal towards which modern painting tended more and more to conform. Portrait painting had undergone a great change. Modern portraits, while excellent as portraits, were not pictorial. In modern painting there was an absence of the religious and classic subjects once so strong, and there was a break from the traditions in that, owing to the introduction of the factory system of production, things of utility were not now adorned as they had been from earliest times. Then the old masters stood out from the general body of artistic craftsmen. They had still the domestic style of sculpture, the monumental style had died out, and sculpture had passed under the influence of painting, which was the dominant art of the day. Painting was on the increase, and Scotland produced a large number of artists whose works, shown in the Edinburgh and Glasgow Exhibitions, he thought, had done more for the lovers of pictures than the Academy Exhibition in London.

From time to time parts of a very important building of the Roman period have been unearthed in Bailgate, Lincoln. The first discovery was made in 1878, when three columns, including a double one at the north angle, were found under a house. These have been carefully preserved, and can be seen by those interested. Nine years later the bases of three more columns were found in the foundations of property which adjoins, and from time to time the discovery of other columns forming part of the same building has been recorded. The late Precentor Venables identified the building as the hall of justice. The building, from the latest discoveries, is shown to have been 280ft. along the front, and about the same in depth from east to west—15ft. longer than the nave of Lincoln Cathedral. Up to the present week, 17 of the columns, forming the front colonnade, had been brought to light, only (with the exception of three) to be covered up again, as they take a diagonal line across the roadway in the Bail. This week, while excavations were being made for two other columns completing the line, an elaborate piece of tessellated pavement 2ft. higher than the bottom of the bases of the columns, was discovered. This pavement must have belonged to a building of a much later period than the *basilica*—if such it be. A careful drawing of the portion of pavement laid bare has been prepared by Mr. H. H. Dunn, A.R.I.B.A., of St. Peter's Churchyard, Lincoln. The border consists of four alternate broad bands of red and white cubes, with an inner and narrower band of white. Then comes a small strip of blue cubes. A circle of blue touches each inner side of the



square, and in the corner angle thus made there is a "bud" in red, blue, and white. The outer circle incloses a smaller one, and between them there is a guilloche pattern. The centre design is that of a head, plainly discernible, and around this is drapery; the colours used in the centre are the same as in the border, with the addition of a little purple. For want of funds and, we fear, adequate local interest in the discovery, the excavations have been filled in again, but in a manner calculated not to injure the pavement, and it is to be hoped that sufficient public spirit will be shown to insure that the explorations shall be continued, and the pavement brought to the surface.

THE Education Department have issued a paper relating to the question of the construction and situation of rooms for manual instruction in connection with public elementary schools. They find that these rooms have often been built on sites originally approved only for ordinary school accommodation, and that the open playgrounds have thereby been reduced in size and the sources of fresh air supply to the schools have been injured, in violation of the principles laid down in the building rules. Manual instruction should not be given in the class-rooms; a room to be used for manual instruction need not be on the same site as the school to which it is attached; and a room to be used for manual instruction should not be built on a site already occupied by the playground of a school, and the plan, arrangements, construction, lighting, and ventilation of the room should be those suitable for a workshop rather than those suitable for a school. It is added that satisfactory buildings can be provided at a cost of 10s. per superficial foot, and that the maximum cost ought never to exceed 15s.

AN unusual course was taken by one of the firms of builders who tendered for the Sanatorium extension at St. Helen's, Lancs. The health committee passed by the lowest tender for the work, and accepted a higher one from Messrs. Whittaker and Woods, of Shaw-street, St. Helen's. This came to the knowledge of the firm (Messrs. Waizbom and Son) who had given the lowest estimate, and they were naturally much aggrieved. They wrote to individual members of the town council, strongly protesting against the action of the committee, and when the health minutes came up for confirmation, the subject was ventilated. It was stated that the difference between the two tenders was no less than £400, the respective amounts being £6,475 and £6,020, and an explanation was demanded. The chairman wisely refrained from entering upon such a delicate matter, and simply stated that the committee were perfectly unanimous in their decision. An attempt was made to refer the resolution back, but the town council by a large majority refused to agree to that course.

A MEETING was held at the offices of the Bristol Master Builders' Association, Guildhall, Bristol, on Wednesday week, for the purpose of considering the question of the formation of a federation of the master builders' associations in the West of England and South Wales, when representatives from the associations at Bristol, Bath, Taunton, Bridgwater, Weston-super-Mare, Plymouth, Newport, and Cardiff were present. Mr. A. Krauss, president of the Bristol Association, who was elected to the chair, said the subject of a federation for the district was first broached to him by Mr. T. F. Rider, of London, the chairman of the National Association of Master Builders of Great Britain, at Blackburn, and he trusted that something practical would be the outcome of the meeting. After the rules governing a similar federation now existing in Lancashire had been read, a long discussion ensued, and eventually Mr. James E. Turner (Cardiff) moved, Mr. E. J. B. Mercer (Bath) seconded, and it was resolved unanimously, "That it is desirable to establish a master builders' federation of the associations in the various towns and localities in the West of England and South Wales." The next resolution put forward was "That such federation be organised upon the lines of the Lancashire Federation." This was moved by Mr. W. M. Blackburn (Newport), seconded by Mr. H. J. Spiller (Taunton), and carried *nom. con.* Mr. James E. Turner (Cardiff) then proposed, and Mr. George Humphreys (Bristol) seconded, "That the delegates meeting here to-day report to their associations the principles adopted at this meeting, and that the rules of the Lancashire Federation be forwarded to the secretaries of the various associations invited here for their guidance

in the matter, with a request to report the views of their associations thereon to the convener of this meeting at an early date, with the view of another meeting being called as soon as possible." This resolution was carried unanimously.

THE report of the Guinness Trustees for the year ending 31st December, 1896, just issued, shows that the capital of the London Fund now amounts to £279,802. The sum given by Lord Iveagh in 1889 was £200,000, to which has been added the sum of £25,000, given by the Goldsmiths' Company in 1893, and £54,802, net income from rents and investments. The net income for the year amounted to £11,856. All the buildings continue to let well. On the 31st December there were 7,219 persons living in the Trust buildings. The average weekly earnings of each tenant (including those of his family) in residence at the close of the year were 19s. 9½d. The average weekly rent of each room was 2s. 1½d. This includes chimney-sweeping and the use of Venetian blinds, common-room, baths, and hot-water supply. The Trustees have purchased a site in Snow's Fields, Bermondsey, and buildings, containing 356 tenements, are now in course of erection thereon. When these buildings are completed, the Trustees will have provided 2,233 separate dwellings, containing 4,568 rooms, besides laundries, club-rooms, and costers' sheds. The capital of the Dublin Fund now amounts to £57,038.

UNDER the title of "Plastering—Plain and Decorative," Mr. Batsford is about to issue a very comprehensive and practical treatise on the art and craft of plaster and stucco, by Mr. William Millar. An introduction by Mr. G. T. Robinson, F.S.A., a considerable authority on the subject, adds value and gives an imprimatur to the volume, which will consist of 600 pages quarto size, and be strongly bound in buckram. The subject is treated under the heads of—Historical Plastering, Materials, Lime Plastering, Ceilings, Running, Diminished and Circular Mouldings, Exterior Plastering, Modelling, Moulding and Casting, Mould Making, Gelatine Moulding, Fibrous Plaster Work, Reverse Moulding, Compositions, Scagliola, Foreign Plaster Work, Terracotta, Concrete, and Tools and Appliances. An appendix gives quantities and recipes; a glossary of terms makes up the contents.

M. LAFAYETTE, the famous Dublin photographer, has opened a studio at 179, New Bond-street, the premises having been remodelled under the architectural supervision of Mr. E. W. Wimperis, of 22, Conduit-street. Perhaps one of the most curious and remarkable features in the new studio is a mechanical apparatus for annihilating that deadly enemy of the photographer, the London fog. It consists of a machine, invented by M. Lafayette himself, for filtering and purifying the air entering the building, warming it, and distributing it throughout the various rooms. The apparatus at the same time lets out the foul air. In hot weather fresh air is brought into the building, filtered, passed through a cooling-chamber, and taken over the building in a like manner, and thus, both in winter and in summer, the warming, cooling, and ventilation of the building are under entire control. M. Lafayette's studio is replete with every other requisite for the production of photographs in the best and most artistic styles, and the specimens of his work, which are to be seen on every hand, prove him to be a master in the art of photographic portraiture.

THE *Manchester City News* says that owing to the successful works of the cotton-spinning industry in Oldham and district, a revival is threatened of the mill-building mania. In most cases one-half the capital is lent on mortgage, and three-fourths of the remaining half are taken by contractors of all sorts, architects, builders, machinists, and even Liverpool cotton brokers, who take up shares on condition of selling cotton to the company.

A Local Government Board inquiry was held at Rhyl on Tuesday week as to an application made by the Rhyl Urban Council for power to borrow £1,400 for the purpose of extending the west promenade to beyond the Winter Gardens, it being proposed to make a footway 10ft. wide on the land side, a carriage-way 32ft. wide, and a promenade 16ft., with sea-wall and defences. The total cost of the new work would be £3,116, but the ratepayers were only asked to contribute £1,400, the private owners of property paying the remainder of the cost, and giving upwards of 800 square yards of land.

## MEETINGS FOR THE ENSUING WEEK.

TO-MORROW (SATURDAY).—Building Trades Exhibition, Agricultural Hall. Opening by the Lord Mayor at noon. Visit of the Architectural Association. 3 p.m.

MONDAY.—Surveyors' Institution. "Fruit-Growing as an Auxiliary to Agriculture," by C. H. Hooper, F.S.I. 8 p.m.  
Society of Arts. "Alloys," Cantor Lecture No. 2, by Prof. W. C. Roberts-Austen, C.B., F.R.S. 8 p.m.

TUESDAY.—Institution of Civil Engineers. 8 p.m.

WEDNESDAY.—Society of Arts. "The Transmission of Power by Alternating Electric Currents," by W. B. Eason, M.Inst.C.E. 8 p.m.  
Carpenters' Hall Free Lectures. "Practical Plumbers' Work," by J. Wright Clarke. 8 p.m.

THURSDAY.—Society of Architects. "Technical Schools from a Schoolmaster's Point of View," by Dr. C. H. Draper, Rutlish Science School, Merton. St. James's Hall, Piccadilly. 8 p.m.  
Society of Arts. "The Cultivation and Manufacture of Rhea Fibre," by Thomas Barraclough. 8 p.m.

## Building Trades Exhibition.

ROYAL AGRICULTURAL HALL, ISLINGTON.

OPEN MARCH 20 TO MARCH 27.

The most complete Exhibition of Building Materials, Architectural Drawings, Models of Old Work, &c., &c., ever held. Conferences and Handicraft Competitions daily.

THE RT. HON. THE LORD MAYOR

Will Open the Exhibition TO-MORROW (Saturday) at Noon.

ADMISSION DAILY ONE SHILLING.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE FIFTH ORDINARY MEETING of the Society of Architects for the Session 1896-97, will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on THURSDAY, MARCH 25th, 1897, at Eight o'clock p.m., when a Paper will be read by Dr. C. H. DRAPER, of Rutlish Science School, Merton, entitled: "TECHNICAL SCHOOLS FROM A SCHOOLMASTER'S POINT OF VIEW." The Lecture will be illustrated.

ELLIS MARSLAND, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.

## CHIPS.

The proposed new code of building by-laws for Cardiff was considered by the Public Works Committee of that town on Friday, and was referred to the borough engineer, Mr. Harper, to report on the points in dispute.

The Great Western Railway Company began on Friday some important and extensive alterations and additions on the Vale of Llangollen, Llangollen and Corwen, and Corwen and Bala lines. The work undertaken comprises the doubling of the line from Ruabon to Llangollen, new and extended platforms, booking-offices, and improved waiting accommodation at the stations, and a footbridge at Llangollen. The stations from Llangollen to Bala Junction will also be improved. The works will entail an outlay of about £37,000.

The proposal to place frescoes in the Royal Exchange is making progress. At the last meeting of the Court of Common Council it is reported that the picture of "William the Conqueror Giving the Charter to the Citizens of London," by Mr. Seymour Lucas, A.R.A., will be finished by June. As to the picture given by the Mercers' Company, "Opening of the First Royal Exchange by Queen Elizabeth," Mr. Ernest Crofts, R.A., hopes to finish it by November, and Mr. S. J. Solomon, A.R.A., who is painting "Charles I. Demanding the Five Members at Guildhall," hopes to finish it by June. As to the "Offer of the Crown to Richard III. in Baynard's Castle," Mr. Sigismund Goetze is waiting for the sketch to be returned.

In the Divorce Court on Saturday Mr. Justice Barnes granted a decree *nisi*, with costs and the custody of the children, in the undefended petition of William M'Kelvie, surveyor to the Ely District Council, for a dissolution of his marriage on the ground of his wife's misconduct with Dr. Charles Thorp, formerly in practice at Ely. The petitioner, who said he was a civil engineer, was married at Lincoln in 1883, he being then assistant surveyor at Lincoln. In July, 1888, he obtained his present appointment at Ely, and they went to live there. Subsequently the misconduct which formed the subject of the present action took place.



## LIST OF COMPETITIONS OPEN.

Enniskillen—Town Hall (£7,500 limit)	£50, £20, £10	Thomas Elliott, Borough Surveyor, Enniskillen	Mar. 20
Christiania—Railway Terminal Station Plans	£555 10s., £222 4s. 6d., £111 2s. 3d., 255 11s.	Railway Offices, 6, Victoria-terrace, Christiania	" 31
Govan—Town Hall and Offices (£25,000 limit, Mr. G. Washington Browne, A.R.S.A., Edinburgh, Assessor)	£100 (merged in 4 per cent.), £50, £25	A. Macdonald, Town Clerk, Hillock House, Govan	" 31
Sheffield—Westbar Fire & Police Station (local Architects only)	Four premiums of £15	H. Bramley, Town Clerk, Sheffield	" 31
Guernsey—States Assembly Hall (£15,000 limit)	£100, £50	N. Domaille, Supervisor of Harbour, States Offices, Guernsey	April 17
Long Buckley, Northants—Water Supply Scheme	50gs.	William Willoughby, jun., Clerk, Daventry	" 21
Halifax—Police Station and Court House (no Assessor)	£50, £25	Keighley Walton, Town Clerk, Halifax	" 30
Elne, France—Water Supply Scheme (3,300 inhabitants)		La Marie, Elne, Pyrenées Orientales	July 1
Carlton, Victoria—Children's Hospital	£100, £50, £25	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	50gs. (merged in 5 p.c.), 20gs., 10gs.	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Bedminster—Club Pavilion	Cricket and Football Ground Co.	James Hart, Architect, Liverpool Chambers, Corn-street, Bristol	Mar. 19
Dewsbury—Seven Houses, Moorlands-avenue North		W. and D. Thornton, Architects, Oates-street, Dewsbury	" 19
Barnsley—Enlargement, Highfield House, Sackville-street		Senior and Clegg, Architects, 15, Regent-street, Barnsley	" 19
Ashton-under-Lyne—Stores, Whiteacre-road	Higher Hurst Co-operative Society	D. Lindley, Architect and Surveyor, 150A, Stamford-st., Ashton-u-L.	" 20
Belfast—Masonic Hall, Crumlin-road	Building Committee	R. B. Andrews, Hon. Sec., 104, Cliftonpark-avenue, Belfast	" 20
Omagh—Labourer's Cottages	Board of Guardians	Wm. Cathcart, the Workhouse, Omagh	" 20
Gigla, N.B.—Three Cottages		Hugh Douglas, Gigla, Argyleshire	" 20
Cashlill—Roman Catholic Church	Very Rev. Bernard Kelly	E. J. Toye, Architect, Strand, Derry	" 20
Portrush—Bank	Belfast Banking Co.	Vincent Craig, Architect, 5, Lombard-street, Belfast	" 20
Leeds—Purifier House, Meadow-lane	Gas Committee	R. H. Townley, Superintendent, Municipal Offices, Leeds	" 20
Langtoft—Restoration of Roof, North Aisle Church	Churchwardens	J. C. Traylen, Diocesan Surveyor, Broad-street, Stamford	" 20
King's Lynn—Alterations to Prince of Wales' Inn	J. and H. Yates, Wisbech	Geo. Thorpe, Architect, Exchange-square, Wisbech	" 20
Halifax—Warehouse, Union-street South		A. G. Dazell, Architect, 15, Commercial-street, Halifax	" 20
Belfast—Masonic Hall, Crumlin-road	Building Committee	R. B. Andrews, Hon. Sec., 104, Clifton Park-avenue, Belfast	" 20
Blaencaran—Sion Welsh Independent Chapel and Schools	Belfast Banking Co.	Rev. J. Morris, Blaencaran Farm, Maester	" 20
Portrush—Bank		V. Craig, Architect, 5, Lombard-street, Belfast	" 20
Spelter, Glam.—Congregational Chapel	St. George's East Guardians	D. Jones, Secretary, Supply Stores, Tywith	" 20
Upton Park—Alterations to School		J. R. Browne, Clerk, Raine-street, E.	" 20
Langtoft Church—Restoration North Aisle Roof		J. C. Traylen, Architect, Stamford	" 20
Barry Docks—Welsh Baptist Chapel	Corporation	Rev. T. M. Rees, Glan Cerith, Barry Docks	" 20
Batley—Five Houses, Black Bull Estate, Commercial-street	Corporation	John H. Brearley, Architect, Hanover-street, Batley	" 22
Blackpool—Cemetery Registrar's House	Industrial Co-operative Society	T. Loftos, Town Clerk, Blackburn	" 22
Middlesbrough—Entrance Lodge, Ludthorpe Cemetery	E. and T. Clark	F. Baker, Borough Engineer, Middlesbrough	" 22
Leeds—Store, Ashton-grove	T. C. Turton, J.P.	J. W. Fawcett, Secretary, 10, Albion-street, Leeds	" 22
Goole—Altering Offices, Gladstone-terrace	Corporation	H. B. Thorp, Architect, Goole	" 22
Goole—Four Shops, Boothferry-road		H. B. Thorp, Architect, Goole	" 22
Halifax—Foundations to Band Stand, People's Park		E. R. S. Escott, Borough Engineer, Halifax	" 22
Cardiff—Converting Dwelling-Houses into Shops, Cowbridge-rd.		W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff	" 22
Elgin—Additions to Linkwood Distillery		Charles C. Doig, Architect, Elgin	" 22
Bradford—Four Through Houses at Laisterdyke		G. C. Gamble, Archt., Parkinson's Chambers, Market-st., Bradford	" 22
Crowland—Renovating Primitive Methodist Chapel		R. Sharpe, Crowland	" 22
Boston—Renovating, Primitive Methodist Chapel	L. and Y. Railway Co.	Thos. and Chas. B. Howdill, Architects, 24, Albion-street, Leeds	" 22
Liverpool—Storage N. Mersey Stores Yard	School Board	C. W. Bayley, Secretary, Hunt's Bank, Manchester	" 23
Portsmouth—Schools, George-street (1,284 places)	Corporation	J. T. Bascombe, Clerk, Town Hall, Portsmouth	" 23
Bury, Lancs—Reconstruction of Turkish Bath	Leeds Corporation	John Haslam, Town Clerk, Bury	" 23
Upper Wortley, Leeds—Branch Library and Police Station	Stretford Urban District Council	Town Clerk, Leeds	" 24
Old Trafford—Refuse Destructor	Urban District Council	J. Bowden, Architect, 14, Ridgefield-street, Manchester	" 24
Halifax—Additions to Washer-Lane Dyeworks	School Board	R. and R. E. Horsfall, Architects, 15, George-street, Halifax	" 24
Barnet—Fire-Engine House and Cottage, Tapster-street	Guardians	H. W. Poole, Clerk, Barnet	" 24
Swinton—Additions to Roman-terrace School	S. Harrison	H. L. Tacon, Architect, 11, Westgate, Rotherham	" 24
Blackburn—Shed, &c., at Workhouse	J. Jones	R. C. Radcliffe, Union Clerk, Cardwell-place, Blackburn	" 24
Castleford—Residence, Pontefract-road	T. Day	Arthur Hartley, Architect, Carlton Chambers, Castleford	" 24
Castleford—Dwelling-House, Normanton Common		Arthur Hartley, Architect, Carlton Chambers, Castleford	" 24
Castleford—Two Dwelling-Houses, Whitwood Mere		Arthur Hartley, Architect, Carlton Chambers, Castleford	" 24
Swinton—Reseating Parish Church	Stretford Urban District Council	E. Isle Hubbard, M.S.A., Moorgate, Rotherham	" 24
Old Trafford—Refuse Destructor	Cemetery Committee	F. Whitworth, Clerk, Old Trafford	" 24
Colchester—Additions to Superintendent's Lodge, Cemetery		Herbert Goodyear, Borough Engineer, Colchester	" 24
Colchester—Entrance Gates, &c., Public Bathing Place, Colne Bank-road	Corporation	Herbert Goodyear, Borough Engineer, Colchester	" 24
South Moor—Miner's Lodge	J. W. Thompson, Architect, Newcastle-on-Tyne		" 25
Staverton—Additions to Landscope School	C. G. S. Accock, M.S.A., Totnes		" 25
Reading—Swansea-road School (890 places)	G. W. Webb, Architect, Market-place Chambers, Reading		" 25
Ovenden—Pir of Semi-Detached Houses	Medley Hall, Architect, 29, Northgate, Halifax		" 25
Featherstone—Assembly Rooms and Market Hall	W. E. Clayton-Smith, Secretary, Ropergate, Pontefract		" 25
Gloucester—Showrooms at Cattle Market	G. Sheffield Blakeway, Town Clerk, Guildhall, Gloucester		" 25
Newton Abbot—House and Six Cottages	J. W. Rowell and Son, Architects, Newton Abbot		" 25
Marsden—Additions to National School	J. Kirk and Sons, Architects, Huddersfield		" 25
Blarney—National Schools	Rev. D. Lynch, P.P., Blarney		" 25
Mickleton—Rebuilding Primitive Methodist Chapel	Rev. J. Foster, The Manse, Middleton-in-Teesdale		" 26
Strabane—First Presbyterian Church	Wm. Barker, Architect, 25, Orchard-street, Londonderry		" 26
Rugby—Additions to Workhouse Infirmary	T. W. Willard, Architect, Rugby		" 26
Kendal—House, Maude-street	G. B. Burrow	J. Stalker, M.S.A., Kendal	" 26
Batley—Ten Scullery Houses in Pynate-road, Carlinghow-lane	Batley Co-operative Society, Ltd.	James B. Buckley, Architect, Batley	" 26
Craigellachie, Banff—Police Station	Banffshire County Council	F. George, County Clerk, Banff	" 26
Knowlton—Rebuilding Hop Oast	Holborn Board of Guardians	W. J. Jennings, Architect, 4, St. Margaret-street, Canterbury	" 27
Mitcham—Laundry, &c., Workhouse	John Walsh	C. E. Vaughan, F.R.I.B.A., 25, Lowther-arcade, W.C.	" 27
Sheffield—Drapery Establishment		Floekton, Gibbs, & Floekton, Archts., 15, St. James's-row, Sheffield	" 27
Fleet, Lines—Church Restoration		W. M. Fawcett, F.S.A., F.R.I.B.A., 1, Silver-street, Cambridge	" 27
Paisley—Volunteer Drill Hall	District Committee	T. G. Abercrombie, Architect, 13, Gilmour-street, Paisley	" 27
Aldford, N.B.—Epidemic Hospital		Jas. Duncan and Son, Architects, Turrif	" 27
Cleish—Additions and Alterations to Parish Church	Urban District Council	Hardy and Wight, Architects, 74, George-street, Edinburgh	" 27
Cockfield, Durham—Additions to Infant School	Major-General Bond	Wm. Livesey, Architect, Raby, Staunton	" 27
Hampton Wick—Alterations, Lambsdowne House	Board of Guardians	J. N. Horsfield, Surveyor, Hampton Wick	" 27
Dulleton—Gate Lodge	Victor C. W. Cavendish, M.P.	W. E. Pinkerton, M.R.I.A., 8, Diamond, Derry	" 27
Nantymoel—Ten Houses	Town Council	John Owen, The Villa, Nantymoel	" 27
Epsom—Laundry and Engine-house at Workhouse	Industrial Society, Limited	W. O. Reader, Clerk, Lonsdale House, Epsom	" 30
Carl-in-Cartmel—New Church, Flookburgh	Governors	Austin and Paley, Architects, Lancaster	" 30
Dover—Car-shed at Maxton	Health Committee	E. Wollaston Knocker, Town Clerk, Castle-hill House, Dover	" 30
Consett—Eight Dwelling Houses, Green-street	Northumberland County Council	The Secretary of Society, Gibson-street, Consett	" 30
Newtown, Mont.—County Intermediate School	Boston and Co.	M. Woosnam, Clerk, Bank Chambers, Newtown	" 31
Sheffield—Baths, Sutherland-road	North-Eastern Railway Co.	C. F. Wake, City Surveyor, Town Hall, Sheffield	" 31
Whitfield—Widening Bridge	Metropolitan Asylums Board	County Surveyor, Moot Hall, Newcastle-on-Tyne	" 31
Spittal—15 Houses on Promenade		J. L. Miller, Architect, 39, Hyde Hill, Berwick-on-Tweed	" 31
Selby—Engine Shed, &c.		The Secretary, North-Eastern Railway Co., York	" 31
Tottenham—Additions to Northumberland Arms p.h.		V. P. Rawlings, Architect, 19, Willoughby Park-road, Tottenham	" 31
New Cross—Underpinning Isolation Ward, Fever Hospital		T. D. Mann, Clerk, Norfolk-street, Strand, W.C.	" 31
Fochriw—Dwelling at Penybanc		L. Evans, Penybanc, Fochriw	" 31
Drighlington—Wesleyan Sunday Schools	H.M. Commissioners of Works	Walter Hanstock, Architect, Branch-road, Batley	" 31
West Hartlepool—Post Office	Board of Guardians	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	April 2
Old Hill—Primitive Methodist Schools	Industrial Co-operative Co.	Rev. H. G. Button, Old Hill, Staffs	" 2
Westminster Workhouse—Doctor's Room	Shedfield United Gaslight Co.	Joseph Bond, Clerk, Poland-street, W.	" 2
Sandbach—Shop on the Hill	School Board	Albert Price, Architect, Elworth, Cheshire	" 2
Grimesthorpe—Roof, Gasworks (360ft. by 700ft.)	H.M. Commissioners of Buildings	Hanbury Thomas, Secretary, Commercial-street, Sheffield	" 3
Pontypridd—School, Llanwood (1,135 places)	West Ham Corporation	D. Milton Jones, Clerk, Pontypridd	" 3
Walworth, S.E.—Postmen's Offices		Hon. Reginald B. Brett, Secretary, 12, Whitehall-place, S.W.	" 6
Dunluce, Bushmills—Enlargement of Parish Church		Rev. J. B. Bristow, Rector	" 12
Stratford—Sewage & Electric-Lighting Buildings, Abbey Wharf		F. E. Hilleary, Town Clerk, West Ham	" 13



## BUILDINGS—continued.

Ipswich—Alterations to Tower House, Tower-street	School Board	J. H. Hume, Clerk, Post Office Chambers, Ipswich	April 13
Chatham—Town Hall and Municipal Offices	Corporation	H. P. Mann, Town Clerk	" 26
Ebchester—Seven Houses in Flats, Blackall Mill	School Board	J. Charlton, Pear Tree Farm, Ebchester	" "
Dukinfield—Schools (900 places)	T. W. Stansfeld	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	" "
Dukinfield—Detached Villa, Old-road		Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	" "
Darlington—Stabling, Tubwell-row		C. N. Coates, Stapleton, Darlington	" "
Denton, Lancs.—House		J. H. Burton, Surveyor, 2, Guide-lane, Hooley Hill	" "
Chelmsford—Wesleyan Chapel and Schools		Gordon, Lowther, and Gaton, Architects, Finsbury House, E.C.	" "
Bidford—House		—, Barlow, White Lion Hotel, Bidford, Warwickshire	" "
Bradford—Alterations to Warehouse, Vicar-lane		F. Moore, Architect, 40, Sudbri-rose-road, Bradford	" "
Manchester—Fifteen Houses and a Shop, Halliwell-lane, High-town			" "
Poynton, Stockport—Methodist Free Church		J. R. Pemberton, 23A, Brazennose-street, Manchester	" "
Stratham Hill—Completing Six Houses		F. W. Dixon, Architect, Trevelyan-buildings, Manchester	" "
Leeds—Three Through Houses, Crossgates		F. H. Harvey, F.S.I., 183, Lavender-hill, S.W.	" "
Killamash—Retort House and Offices		256, Kirkstall-road, Leeds	" "
Holly Hall, Dudley—Two Houses	Gas Co.	W. H. Wagstaff, A.M.I.C.E., 57, Saltergate, Chesterfield	" "
Oswaldtwistle—Assembly Room and Shop	Co-operative Society	Thos. Robinson, Architect, Victoria Chambers, Stourbridge	" "
Oxenhope, Keighley—Store and Sewer Houses	Uppertown Co-operative Society	Haywood and Harrison, Architects, Accrington	" "
Oxenhope—Six Houses, Goose-green		J. Haggas, Architect, North-street, Keighley	" "
Poynton, Stockport—Additions to Methodist Free Church		J. Haggas, Architect, North-street, Keighley	" "
Rochdale—Friendship Inn, Shotland-road		F. W. Dixon, Architect, Trevelyan-buildings, Manchester	" "
Rochdale—Additions to John-street Tavern		E. Wood, A.R.I.B.A., 78, Cross-street, Manchester	" "
Wrexham—Enlargement, Summerhill Presbyterian Chapel	Phoenix Brewery Company	G. A. Hammond, Architect, Rochdale	" "
Leeds—Demolition of Old Buildings, Excavating and Underpinning		J. Wrigley, Wrexham	" "
Wigan—Congregational Sunday Schools	London and Midland Bank	Wm. Bakewell, F.R.I.B.A., 88, Park-square, Leeds	" "
Sichlinghall—Fever Hospital	Wetherby Rural District Council	W. E. V. Crompton, A.R.I.B.A., Moot Hall Chambers, Wigan	" "
Stourbridge—Brewery	North Worcestershire Breweries Co.	T. E. Marshall, Architect, Prince's-street, Harrogate	" "
Shipley—House in Nab-lane		C. Johnson and Sons, Architects, Worcester	" "
Rotherham—Screen and Stalls, Parish Church	J. W. Nelson	A. Neill, Architect, 16, Cookridge-street, Leeds	" "
Iveghill, Cumberland—Farmhouse at Colt Close	Glasgow Agricultural Society	J. E. Knight, Architect, 20, Moorgate-street, Rotherham	" "
Auchnagat—Rebuilding Farm Stabling	J. Maynard	G. Watson and Son, Architects, 3, St. Andrew's-place, Penrith	" "
Glasgow—Fitting-up Summer Show		George Muirhead, Estate Estate Office, Haddo House, Aberdeen	" "
Cork—Additions to House, Sandy's Well		Alex. Russell, Secretary, 175, West-street, Glasgow	" "
Eccles—New Chapel		Arthur Hill, Architect, 22, George's-street, Cork	" "
Ashton-under-Lyne—Four Cottages		T. D. Lindley, Architect, 150A, Stamford-street, Ashton-under-Lyne	" "
Batley—Additions to Rouse Mill		J. Early, Hay Dealer, Ashton-under-Lyne	" "
Whitton Gilbert—Three Cottages		F. Wild, Architect, Bradford	" "
Devonport—Structural Works (Three Years)	Royal Engineers	S. Falkons, Front-street, Sacriston, Durham	" "
Exeter—Structural Works (Three Years)	Royal Engineers	Director of Army Contracts, War Office, Pall Mall, S.W.	" "
Pembroke Dock—Structural Works (Three Years)	Royal Engineers	Director of Army Contracts, War Office, Pall Mall, S.W.	" "
Bridgton, Staffs—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	" "
Cannock—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	" "
Brierley Hill—Primitive Methodist Chapel	Methodist Trustees	Hickton and Farmer, Architects, Walsall	" "
Ulverston—Additions to King's Arms Hotel	R. and P. Hartley	Settle and Farmer, Architects, Ulverston	" "
Rochdale—House, Shaw-street	Thos. Firth	Nordcliffe Mills, Architect, 67, Lord-street, Rochdale	" "
Pudsey—Alterations to Waterloo Inn	Tramways Co.	John Jackson, M.S.A., Barry-street, Bradford	" "
Wigan—Working Room and Houses, Platt Bridge	C. Davison	H. T. Johnson, M.S.A., York Chambers, Wigan	" "
Northwold—Reseating Wesleyan Chapel in Pitch-pine		H. Bovill, Auctioneer, Northwold, Norfolk	" "
Burmantoft—Boot Factory, Compton-road		W. M. Coghill, Architect, Beech-grove, Stourton, Leeds	" "
Leeds—Four-Story Warehouse, Hunslet-road	Co-operative Society	J. E. Leak, Architect, Hunslet, Leeds	" "
Hunslet Moor, Leeds—Eight Houses, Arthington-avenue		W. M. Coghill, Architect, Beech-grove, Stourton	" "
Ikeston—Bakery and Warehouse		The Secretary, 12, South-street, Ikeston	" "
Cwmpark—Seventeen Cottages		J. Tallis, Raglan-terrace, Cwmpark, Treorchy	" "
Darlington—Scully, Tubwell-row		C. N. Coates, Stapleton, Darlington	" "
Bradford—Additions to Robin Hood Inn		Jas. Jackson, M.S.A., Barry-street, Bradford	" "
Bradford—Shop and House, Manningham-lane		Mawson and Hudson, The Exchange, Bradford	" "
Batley—Stable Memorial Wing, Technical School		H. B. Backley, Architect, 8, East-parade, Leeds	" "
Batley—Villa, Deighton-lane	Condensed Milk Co.	H. B. Backley, Architect, 8, East-parade, Leeds	" "
Anna, near Lisnagry—Creamery	Robert Bower, of Chester	J. P. Evans and Co., 131, George-street, Limerick	" "
Aiskew, near Bedale—Three Cottages	J. E. and T. A. Webb	Robert Imeson, Land Agent, Masham	" "
Chester—Two Houses, Hoole-road	Latham Jackson	Richard Hall, Architect, 251, High-street, Bangor	" "
Aberbeg—Rebuilding Hanbury Arms Hotel	J. Asker	Swaish and Bain, Architects, 3, Friars' Chambers, Newport, Mon.	" "
Rochdale—Eight Houses, Nile-street	W. J. Shortland	N. Mills, 67, London-street, Rochdale	" "
Peterborough—House in Bedford-street		J. G. Stallebrass, Architect, North-street, Peterborough	" "
Irthlingborough—Villa		H. Admitt, Architect, High-street, Rushden	" "
Hooley Hill—Completing Six Cottages	Stanwix School Board	J. B. Burton, Architect, 2, Guide-lane, Hooley Hill	" "
Clacton-on-Sea—Three Houses, Carnarvon-road	School Board	T. H. Baker, Architect and Surveyor, Town Hall, Clacton-on-Sea	" "
Cargo, Carlisle—Alterations to School	J. Alder	Joseph Graham, Architect, Bank-street, Carlisle	" "
Brandon, Suffolk—Additions to High-street Schools		Edw. Boardman and Son, Architects, Queen-street, Norwich	" "
Bury, Lancs.—Methodist Free Church, Parkhills-road		J. D. Mould, F.R.I.B.A., Silver-street Chambers, Bury	" "
Croydon—Pulling down Premises in George-street		A. Broad, A.R.I.B.A., 3, High-street, Croydon	" "
Belfast—West Orange Hall, Shankhill-road		William Batt, Architect, Garfield Chambers, Royal-avenue, Belfast	" "

## ENGINEERING.

Lesbury, Alnwick—Lattice-Girder Footbridge	Alnwick Rural District Council	W. H. Walton, Clerk, Alnwick	Mar. 20
Huelva—Dredging the Padre Santo Channel	Spanish Government	Public Works Department, Madrid	" 20
Swansea—Double Line between Swansea and Port Tennant (1 mile 8 chains)	Rhondda and Swansea Bay Rly. Co.	H. S. Ludlow, Secretary, 8, Fisher-street, Swansea	" 20
Burnley—Filters and Service Reservoir, Cart Clough	Corporation	G. H. Hill and Sons, Engineers, Albert-square, Manchester	" 22
Arklow—Overhanging Footway to Bridge	Grand Jury of Wicklow	E. N. Wynne, Secretary, Court House, Wicklow	" 22
Belfast—Steam Crane (three tons lift)	Harbour Commissioners	W. A. Currie, Secretary, Harbour Office, Belfast	" 22
Guildford—Turbine Plant at the Mill	Corporation	Town Clerk, Guildford	" 22
Holloway—Electrical Generating Set	Ilington Vestry	Electrical Engineer, 50, Eden Grove, Holloway	" 23
South Shields—Electric Lighting Plant	Corporation	J. Moore Haydon, Town Clerk, South Shields	" 23
Wakefield—Two Boilers, Workhouse Infirmary	Board of Guardians	H. Beaumont, Clerk, 47, Kirkgate, Wakefield	" 25
Plymouth—Electric Lighting Plant	Corporation	J. H. Ellis, Town Clerk, Plymouth	" 26
Lincoln—Hot-Water Supply, Count Hospital	Governors	W. Watkins, Surveyor, Silver-street, Lincoln	" 26
Wells, Somerset—Electric Lighting Plant	City Corporation	R. L. Foster, City Clerk, Wells	" 27
Braila, Roumania—Electric Street Tramways (13 miles)		The Mayor of Braila, Roumania	" 27
Burnham-on-Crouch—Water Mains (690 yards)	Maldon Rural District Council	N. G. Keywood, Surveyor, Maldon	" 29
Frankley—Railway (1½ miles), Reservoir (200,000,000 gallons), 18 Filter-Beds, &c.	Birmingham Corporation	E. Orford Smith, Town Clerk, Birmingham	" 31
Ostend—Harbour Extension	Provincial Administrator	17, rue des Augustins, Brussels	April 13
Ostend—New Harbour	Belgian Government	The Commercial Museum, Brussels	" 17
Brazil, St. Paulo—Lighting City by Gas	Municipality	Department of Agriculture, St. Paulo, Brazil	" 30
Wilmslow—Laying Gas Main	Gas Company	Wm. Severs, Engineer, Wilmslow, Manchester	" "
Glasgow—Electric Light Plant, at Olympia		Lithgow and Son, 76, West Howard-street, Glasgow	" "
Barnsley—Well at Oakwell Brewery		Secretary, Burnley Breweries Co.	" "
Baldock—Overshot Waterwheel		John Randall, Stofold Mills, Baldock	" "

## FENCING AND WALLS.

Goldcliff, Mon.—Sea Wall	H.M. Commissioners of Sewers	W. S. Gustard, Clerk, Newport, Mon.	Mar. 20
Gorey, Ireland—Twelve Iron Gates and 24 Iron Posts	Guardians	R. Creighton, Executive Sanitary Officer, Gorey	" 20
Cardiff—Undimable Iron Fencing (500 yards, 6ft. 6in. high)	Corporation	J. L. Wheatley, Town Clerk, Town Hall, Cardiff	" 25
Gloucester—Walls and Palisading, Bull Ring	Corporation	G. Sheffield Blakeway, Town Clerk, Guildhall, Gloucester	" 25
Woodale, Redcar—Dry Stone Walling (500 roads)		Jas. Rutherford, Kirkleatham, Redcar	" "

## FURNITURE.

Midhurst—Furniture to Offices	Rural District Council	Edwin Albey, Clerk, Midhurst	Mar. 22
Croydon—Furnishing a Ward at Union Infirmary	Board of Guardians	H. List, Clerk, Union Office, Mayday-road, Thornton Heath	" 22
New Cross—Furniture for Fever Hospital, Hatfield-street	Metropolitan Asylums Board	T. D. Mann, Clerk, Norfolk-street, Strann, W.C.	" 25
North Skelton—Furnishing Institute		Ranson and Walker, Secretaries, North Skelton	" "

## PAINTING.

Hull—Holderness-road Primitive Methodist Chapel	H. Bower, Hon. Sec., 88, Witherns, Hull	Mar. 22
Morley—Seven Houses and Shop, Middleton-road	The Secretary of Society, Morley	" 23
Rotherham—External Works at Hospitals, Badsley Moor-lane	H. H. Hickmott, Town Clerk, Rotherham	" 23
Winchester—Municipal Buildings	W. Bailey, Town Clerk, Winchester	" 25
Bradford—Outside of Mechanics' Institute	J. Reddie, Secretary, Bradford	" "



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### POPULAR NOTIONS OF BUILDING.

THE public interest taken in architecture and its kindred arts is very spasmodic, and is of a rather selfish kind. If Tom Brown thinks of buying a house, he will develop an abnormal interest all at once in the equipment of a modern dwelling, its bath-room, and sanitary arrangements; or, if he thinks of decorating his rooms, he will begin to read up books on modern decoration and art, pottery, fabrics, and pictures, and the latest authors on those subjects. If an important public building is talked about, the extent of his criticism will chiefly limit itself to "style," to what the newspapers say, or to make "odious" comparisons of English buildings with noted examples abroad. Attacks on our architects and on what they have done, the bad and ill-ventilated Government buildings, or on the parsimony and poverty of our architecture, are, of course, the prevailing sort of criticism one hears; but, after all, he understands much less about the matter intelligently than he does about the affairs in Crete, the South African inquiry, or the Stock and Share Market, on all of which questions he obtains direct information through his newspaper. It seems clever to criticise when one does not know much, and architecture is one of those special subjects which lie outside the range of the average reader's purview. Why it should be so is probably because it is a technical art, and to learn anything intelligently about buildings, one ought to know the problem which the architect has to attack. Still, for all that, the average reader and business man thinks he ought to know something about architecture—enough to talk and discuss it amongst his friends. It is this imperfect knowledge that has been the grievance; that men who know nothing about the practical points at issue, the materials and requirements, should venture to give an opinion about a building whether it is a good or a bad design. These very same people would not dare to venture an opinion on a question of law or of medicine; but they hesitate not to fulminate their shafts against the architect if he has made a design which looks to them poor or insignificant when compared with another building for a different purpose, or even has forgotten to provide a ventilator. These very "mixed" and confused impressions of the architect's work on the public mind have hindered the progress of real architecture, and have fostered a flippant and superficial estimate of the art. That the public is profoundly ignorant of architecture goes without saying; because they find it not the sort of accomplishment which can be made the most of, like music, or even painting. People will talk glibly on the latest play, or the latest book, which they can understand fairly well; but of a building it is a matter of builders and workmen, which they do not profess to understand, and which to be ignorant of is no disgrace among Englishmen of ordinary education. Before architecture and its professors can be fairly appreciated this notion must be corrected, and one of the best ways of doing so is to set before the public mind those qualities and those crafts which go to make architecture. The popular manuals on the art, in which styles and periods are dealt with, and the Gothic and Classic primers have been insufficient. They have only served to inculcate the idea that architecture is synonymous with archæology, or what is quite as bad, is the same as ornamenting buildings. The con-

ception that it is really building well and beautifully is scarcely grasped at all. That building is a dry and uninteresting mechanical trade is enough to debar hundreds from taking any pleasure in such a study. It never was and never will be popular, like music or any of the phonetic arts, because its very basis is technical, and must be mastered before the mind can understand its true expression. The fact is the architect must educate the public, not the public the architect.

Instruction in technical handicrafts will do something towards this end; but the systems pursued do not touch the vital points. If every ordinary school taught on the Kindergarten plan, not only arithmetic and history and geography, but the elements of building, and if every student was taught to know the qualities of common building materials, and how they are converted, how they should be handled and treated, the future employers of architects would be more appreciative. When we see such a complete perversion of materials like those of stone, wood and iron manifested by the average Englishman and his wife, we cannot wonder that the architect's work is misunderstood. Do we not continually see people painting and even whitening their stone-fronted houses, their stone windows and doorways, wood painted to imitate stone or marble, and iron treated like wood; it is not uncommon to find otherwise intelligent persons taking away columns and other structural supports where they think they obstruct, and covering their walls with papers of tawdry pattern and bad colour. All these things are done in ignorance of the nature of materials. Exhibitions of technical matters and building trades, such as that open at Islington, would do much to instruct the public on these questions if only they took an interest in them, as by these means the actual materials and methods are placed before them. "One ounce of practice is worth a ton of theory" in these subjects. The manufacture and use of bricks and pottery, fibrous asphalt, patented methods of fireproof construction, such as the "expanded metal" system, slag-wool applications, improved door-locks and furniture, incandescent gas-burners, metal casements, stair treads, window fittings, prism lights, and numerous examples of decorative materials, are so many concrete illustrations of what the building community have achieved, and prove that the arts of construction have a commonsense basis, and are not to be judged by individual fancies.

On the artistic side there is something to say. A qualified writer has lately pointed out that although Shakespeare was a many-sided man, and had an intimate knowledge with many sciences and crafts, there were certain things he does not allude to, and one of these is architecture. He has spoken well on music and painting, but is almost silent on architecture of every description; and this omission is the more remarkable because of the many ecclesiastical buildings and castles of England, many of which must have been in their pristine condition in his day. "In the England of Shakespeare's plays these find no place." Though two plays are laid in Venice, he says nothing of St. Mark's or the palaces. In allusions to other great cities, like Verona, Milan, Florence, he is equally silent about the buildings. Does not this indifference to the architectonic sense find a parallel among many whose only sense of building consists in discovering leaky drains, bad ventilation, inconvenient apartments? We hear and know of many who are unmusical, who are unable to appreciate or enjoy music, of those who are colour-blind, who really cannot distinguish red from green, and to whom a painting has no meaning. May it not be said also that there are many blind to architectural effect altogether, who can hardly discriminate between certain buildings? We are all acquainted with people

who are unable to distinguish the purpose of buildings, and many people who make amusing comparisons about churches and cathedrals, of seeing resemblances where none exist. It is equally true that the popular taste favours the Classic or Italian style of buildings—that is to say, buildings and façades that have regular balanced features, and that buildings like the Royal Exchange, the British Museum, or the Natural History Museum find more admirers than edifices of unsympathetic severeness or of plain broad masses. Breadth and irregular features are generally accounted ugly by people who have no art culture. In decoration it is a truism that the most obtrusive patterns and the showiest colours attract the public. And the reason of these preferences is easy to discover. The qualities we have named are better understood by untrained minds. Balanced features and regularity are ingrained in our earliest instincts with pleasure, and they appeal to the sense of ornament. Repetition of halves is one of the earliest instincts of the race, as we find in primitive ornament, vases, spear-heads, and the like.

It will, we fear, be a long time before these popular ideas give place to a healthier and wider view. Look, for example, what people are satisfied with in the shape of their domestic dwellings, their furniture, and decoration. The house with a central entrance and side windows still remains as a sort of fetish, and it is hard to get people to approve of houses which have any character, that have windows unequally spaced, or any breadth or quaintness in their plan or elevation. Among a more educated class of the public, Tudor, Stuart, or "Queen Anne" features have been tolerated, not so much from any intelligent principle of preference, but because they are "correct" or in "good taste," and even amongst this less numerous class the more "florid" or ornamental varieties of these periods are chosen. It is very hard for an architect to persuade his client to adopt any design in which there is any departure from well-known examples. When Lowther Lodge, Kensington, was built, people stared at a departure so entirely unconventional, but to-day it is not considered so *outré*. Equally shocking to most people are the recent buildings erected by a school of men who utterly repudiate the conventions of modern art, men who make good craftsmanship the foundation of design. Nevertheless the art craftsman's ideal cannot be ignored. Not many of the public care for such things as small-paned windows and other eccentricities of the 17th and 18th century revivals, and the architect has to wage a continual warfare against the popular prejudices of men and women who have not troubled to inquire which is the more true or honest. But we despair of educating the public to any appreciation of these matters, where all kinds of tempting forms of so-called art is placed before them, and when the merits of such things as a firegrate, a wall decoration, or a plaster ceiling is made to depend on price or estimated by the covering power of so much. Our most costly public buildings are spoilt by the effort to do no more than is absolutely necessary. There is a painful flimsiness and superficiality of ornament about many of them, when all this show might be saved in building plainer and more solidly. Unfortunately, the profession are often themselves to blame for allowing this state of things to prevail; they pitch their art too high in many cases, and, pandering to public taste, go in for those qualities which are known to be popular, or they estimate too low, and are obliged to resort to the methods of jerry-building. No doubt the commercial spirit is at the bottom of all this. Architectural culture is only possible where wealth is freely expended and the ideals of a more leisured life can be cherished.



## THE BUILDING TRADES EXHIBITION—AND AFTER?

**T**HE ideal way of eating mulberries—as epicures assure us—is to lie down under the tree and let them drop, as they ripen, into one's mouth. Like many other ideals, this one seems "too bright and good for human nature's daily food," and perhaps it is only put forward to impress on us that fruit of this kind will not bear keeping. But there is a sense in which we may take it as an allegory. The modern architect, in one view of him, is really a man under a mulberry-tree. He is far enough from being so in the matter of commissions. Opportunities for bringing out what is in him, for embodying his long meditated schemes in brick and stone, do not usually fall down in this way and beg him to accept them. They are not to be had without much shaking of the tree, or much diligent climbing of it, and even when he gets them they are sometimes half-rotten, and sometimes half-sour. Things are not easy for the architect in the matter of obtaining work, nor in that of doing it. Probably they were never harder. New dangers are constantly arising. If he does not insist that his buildings shall be executed according to contract, his clients have a case against him; and if he does, we now see how the contractor or the contractor's creditors may make him the defendant in an action, and claim damages from him because he would not allow the work to be "rushed through." It is quite otherwise, however, when he wants to obtain knowledge. In our time this pours down everywhere, "unasked, unsought"; and sometimes, therefore, almost unappreciated. Specialists are constantly coming forward either at the Institute, the Association, the Society of Architects, or even the Society of Wits, to put before us, in such a way that we can scarcely avoid seeing them, facts which we should find it hard to get hold of if we began to search by our own unaided resources. Not only the provincial societies, too, but the Surveyors and the Engineers, and many other public bodies are all willing to teach us. We cannot be ignorant of as many subjects as our grandfathers were, even if we try; all day and every day, without an effort, we are imperceptibly absorbing information.

The best training for an architect, it is true, is not what can be thus put into words and sentences. Of that kind it is possible to have too much. In fact, it has long been clear that our immediate predecessors did have too much. They lived, poor men, in the stormy period of architectural literature, and were blown hither and thither all their lives by contrary winds of doctrine. Pugin, Ruskin, and Fergusson, with their innumerable imitators, got up amongst them a perfect cyclone, which raged now from the North, now from the South, and then again from the East. This has happily calmed down, and our contemporaries, no longer driven before the blast, are free to steer in the directions to which their preferences lead them. We are getting, in short, a little art here and there, instead of a great deal of talk about art everywhere. There was a period—and a long period—in which, if the architect or master mason, or whatever he was called, wanted to know what his fellows were doing, his only way of knowing was to go and see it. It was just the same if he wanted to know what his predecessors had done; which is what every artist needs to know, unless he is to begin where the cave men began when natural caves ran short, and they racked all the brains they had to try and contrive artificial ones. The ancient architect would hardly have believed that a time would come when a man could get a fair idea of all that has been, and all that is being done, in architecture without going beyond his own threshold. Yet so it is. Information of this sort, too, drops down on us spontaneously day by day. Draughtsmen—and clever ones—have ransacked Europe for buildings worth measuring and sketching; and week by week they impart to us freely the knowledge they have acquired with so much pains. Week by week, too, the architects of the day publish careful drawings of their latest productions. Modern life keeps providing us with plenty of problems to solve; but each of us has only to keep his eyes open, and he will find, lying before him, with hardly any trouble of his own, more or less perfect solutions of those very problems, devised by the ablest minds of the age.

Papers on the building arts may do much for us. Drawings relating to these arts may do more; but, after all, there is nothing like actually seeing the materials those arts operate on and

the objects they produce. Yet even this we can do on quite a large scale, with very little exertion. Of purely artistic products, a magnificent collection, not half as much appreciated as it should be, is slowly being brought together at South Kensington. What with original works, and what with casts, there is no such place for study elsewhere. If there is any drawback to its usefulness, it is, perhaps, that the things exhibited are on too uniformly high a level. They may keep the modern man humble by showing what an infinity of excellence lies above and beyond the best he can do; but they do not lead him up step by step to the doing of it. They are too costly, too elaborate, too much out of the reach of common people and daily life, and they help, unintentionally, to nourish the great popular delusion of England, that art simply means expensive finery. Perhaps this has so far been inevitable, in a museum built for the public, with public money. But either there or somewhere else there is urgently needed what might almost be called an exhibition of "art without ornament." Some sense of beauty is slowly growing up again, even amongst the middle classes. What needs proving to them, and what the Kensington Museum as yet does not prove, is that beauty is not unattainable even for them. It is not enough to show them what the artist-workman could do for Lorenzo the Magnificent; they must be made to see what he could do for the Browns and Robinsons who have to make both ends meet on £500 to £1,000 a year.

To the British public, however, art is not, and is never likely to be, everything. After the atrophy of its perceptive powers, which has been going for two hundred years or more, it is much if we can once more make it something. But there are matters connected with architecture, or, at least, with building, which even the Briton is interested about. No one who knows him will need to be told that they are the matters which concern the body. These, at any rate, are realities to him, and rather than fail in one of these he will forego, without a sigh, all that one can offer to his intelligence or his imagination. Now, it is with things like these that a building trades exhibition is mainly concerned. Many of them are important, and even indispensable. The architect cannot afford to ignore them: he ought in no case to ignore them, though when he has supplied them he has not done, as his clients very likely think, all that an architect need care about doing. Here, then, is another case in which the modern architect finds a lot of useful information put within his reach, for little more than the trouble of opening his eyes and looking about him. He can see for himself what are the newest things in building materials and sanitary appliances, in plumbing, painting, glazing, and a dozen other trades. He may even observe here and there a bit of artistic work, which is notable and welcome everywhere, though a Building Trades Exhibition is hardly the place where one most expects to find it.

The architect comes, and sees, and is conquered. "I should certainly give this fitting a trial, if I were building a large house." He makes a note of it, with the maker's name and address. Then he goes away, and builds board schools, or factories, or rows of shops. Years after, when his memorandum is lost, he is called upon to undertake the sort of house he was thinking of, perhaps in a place and for a person whose very names were strange to him when he observed the contrivance in question. He dimly recollects the thing, but, as it happens much oftener than not, has totally forgotten who made it, or where it came from. Of course, he long ago received a printed form relating to it, or, perhaps, a printed book; but the never-ending storm of forms and books would have drifted him up six feet deep since he visited the Exhibition, if constant fires and hard labour with the waste-basket had not kept a little breathing-space around about him. His clerks, however, have orders to look for the prospectus. They do not receive the command with joy, well knowing that the clerk who has looked through several years' prospectuses is, for the time, hardly distinguishable from a chimney-sweep. Still, there is soap to be had, and they make the plunge. The prospectus, very naturally, is not to be found. The address is looked for next in some volume of miscellaneous advertisements, where each advertisement consists of five or ten trades jumbled up together, and where looking for any special manufacture is like trying to find a needle in a haystack. Either it is not there, or there is no finding it. The speci-

cation must be written, and written without delay; and so, instead of the speciality he saw at the Building Trades Exhibition, the architect specifies another, perhaps not nearly so good, but another whose maker is wise enough to keep his name, week by week, in one or other of the professional journals.

In cases like this—and they are almost innumerable—both the architect and the manufacturer suffer. Yet it is the latter whose loss is heaviest. Good work can be done, good buildings can be put up, even without the aid of the latest inventions; but a manufacturing business cannot be carried on without orders. To the firms who hire space there a building trades exhibition ought to be a seed-time leading to a prolonged harvest. So it would be if they could only realise the facts of the case, and get out of their beaten track, which really leads nowhere. We will tell them once again what the facts are, looking at them from the point of view of a practising architect.

When a manufacturer sends out circulars or pattern-books, either he fails to realise how many other manufacturers are doing the same thing, or else he supposes architects to possess an immense amount of storage room, and to be fired with an unaccountable zeal for storing printed papers on the remote chance that some day or other they may be useful. Neither of these suppositions is correct. An architect, after a few years, finds it troublesome enough to make room for his own plans and specifications and correspondence—those relating to buildings apparently finished and done with, we mean. As a matter of fact, no architect can ever be sure that he has heard the last of any building which he once erected. It may stand soundly enough for 20 or 30 years, and then, perhaps, some careless contractor may drive a main sewer close under the tower foundations, and keep steam-pumps going day and night for months till he has extracted all the moisture from the soil they stand on. The building inevitably sinks and settles. The sewer contractor says the architect did not construct it properly. The mere opening of a trench 15ft. deep or so just under the edge of the tower concrete could not have done any harm; and as for a little pumping, say, from January to June, it is absurd to suppose that this would affect a properly built church. Then the architect has to turn to his documents, and unless he has carefully preserved them, things may go badly with him. Cases of this sort, either arising in his own experience or heard of in that of his friends, show him the necessity of preserving his own papers by wholesale, when he would gladly enough get rid of them. Their bulk increases year by year, so that the more work he has done, and the more work he is doing, the less room he can spare for catalogues and circulars and printed matter. Still, by every post, they are "serenely arriving, arriving." Once in an age, by great good luck, one may arrive which deals with a material or an appliance he is at the moment looking for, and then its sender may get an order, and perhaps a large one. There may arrive, for instance, some sections of brick mouldings made in a district near which the architect is then intending to use moulded bricks, and if the material is good, and the sections are well designed, instead of being invented, as they commonly seem to be in the Midland counties, by the local architect's youngest and silliest pupil, he may be glad to use them. But if they arrived a year, or several years, before there was a chance of adopting them, the strong probability is that they might as well never have arrived at all. Their merit may have saved them, for the time being, from the flames of the office-cleaner's basket, but they grew black with dust, or the space they occupied was wanted, and so the place that knew them knows them no more.

The conclusion of the whole matter is, that circulars and catalogues are seldom kept long, even if they are kept at all. Actual samples of material, if they are small enough and good enough, are much more likely to be preserved. They inspire confidence. High-flying assurances of excellence, and even testimonials from boards and magistrates, do not count for much; but a good material actually seen and handled is a solid fact, which the architect respects and wishes to keep it where he can refer to it. Of course smallness is essential. The Staffordshire manufacturer, who was asked for one brick as a sample, and who kindly sent enough to build more than a square yard of 9in. wall, decidedly overdid it. A few inches of most materials are enough, and the name of the firm that supplied them should be



permanently affixed to the back. Some samples arrive with the addresses on a separate slip, and then the first puff of wind or the first switch of the duster turns the sample into a standing query, for ever asking the architect: "Where did I come from?" Some manufacturers seem to be mortally afraid lest architects should experiment with their goods. They will send a sample lock which cannot be tried on any actual door, and a sample window fastening which cannot be put on any actual window. Makers of new cements seldom send samples for mixing and testing, but only pats or cakes which have already been made up. If they gave the architect a fair chance of trying their materials, he might probably get interested about them, and if they were good for anything, might take them up; but it is difficult to feel much interest in a ready-made specimen of the sort. The marble-merchant, again, lives in fear lest the architect should make some use of the half-yards of specimen shafts which he is so fond of supplying him with, and to prevent this danger, he roughly rounds the ends, so that they will not stand upright. Rolling about on the floor they soon become a nuisance, and it is not long before they are committed to the dustman's cart. People who send samples should send them of convenient sizes, and should remember that they will be preserved most safely when they are small enough to lock up in a drawer.

It is when the architect is writing his specification that he is, above all, in want of names and addresses. If he remembers the former, he often forgets the latter. The most important ones, or, at any rate, those of the best-known firms, are generally the hardest to meet with. If they are in London, they are doubtless in the "London Directory"; but this is not a book which the average architect finds indispensable. They are not often discoverable in compendiums and volumes of mixed advertisements, for, by a merciful provision of nature, the manufacturer who has attained a certain degree of eminence thinks that his place of abode is engraved on everybody's memory and understanding. By this delusion he loses a fair percentage of the orders that would have come to him, and so smaller men get their chance. To them, and to everybody who wishes to attain a better position, or even to hold the position he has, an architect's advice would be this: "Don't trust too much to catalogues and prospectuses. They are soon lost or useless. Let us hear of you, if only in a line or two, week by week, and let us always be able to find your address by turning to the current number of some professional paper. If it is there, it can be found in a moment, and it is far less troublesome to find it there, and to send you a postcard asking for a catalogue, than to find the catalogue you sent long since when we did not want it."

#### THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, at 9, Conduit-street, W. Mr. W. Howard Seth-Smith, Vice-president, in taking the chair, explained that the President, Mr. Beresford Pite, was still travelling in the East. Mr. F. Rowles was elected as a member.

#### EIGHTEENTH-CENTURY ARCHITECTURE.

An interesting lecture on this subject, illustrated by modern lantern views from contemporary engravings in the Duke of Devonshire's collection, and from modern drawings and photographs, was given by Mr. J. Alfred Gotch, F.S.A., F.R.I.B.A. The eighteenth century, the author observed, saw the final development of that great movement in art which began in the early years of the sixteenth. When mankind had once made up its mind that the masterpieces of Italy were the only examples to be followed, nothing but time and determination were wanted to produce in all the lands of Europe a general sameness of appearance and treatment in every branch of art. In no art was copyism so contagious as in architecture, and in no art was it so injurious. Architecture in the 18th century was the Five Orders and nothing more. An old Roman, called Vitruvius, who had been dead 1700 years, was Dictator, and those of his followers who differed from his precepts, although sometimes excused on account of their success, were admonished to be careful how they risked any deviation from the paths of perfection pointed out by him. Gothic architecture was despised and regarded as barbarous. It was not that the

volaries of the art preferred a Classic dress to a Gothic; for them the buildings erected in the Middle Ages were not architecture at all. The "Gothick Order," as they called it, is described by one of them as "the Folly and very Ape of Architecture." Such an attitude of mind is hardly intelligible to us, who recognise Gothic architecture as at once the most logical and daring form of construction that man has yet employed. It is hardly less difficult to understand how they can have failed to be impressed with the majestic solemnity of a great Gothic cathedral; and yet they did fail—even such cultivated men as Evelyn and Addison. The phrase about the "very Ape of Architecture" occurs in a treatise by a lively Frenchman, M. Freart. The fact is that architecture to them was, as already said, the Five Orders and nothing more—to some of them less indeed, since they only admitted the claims of two out of the five grudgingly and of necessity. Ever since the beginning of the 16th century Europe had been studying the footsteps of the Romans. For more than half that time England had thrown herself into the pursuit, and now the patient efforts of many writers were to be rewarded, and it was to be the aim of every generous patron and every architect of ability to make our English buildings as much like those of Italy as they could. Architectural design was to be a matter of rule and compass. What could be easier? The textbooks gave the proportions, not only of the modern buildings of Italy—or rather the proportions of the Orders which adorned them—but also of some ancient ones upon which the sacred eye of Vitruvius himself must have rested. The architects of those days were, in fact, more or less of amateurs, and the kind of architecture in demand was such as amateurs could supply. The extravagances of the second quarter of the 18th century sprang from an indulgence in taste apart from considerations of propriety, and it was the often-mentioned Lord Burlington who led to them, partly by his own work and partly by his publication of the designs of Inigo Jones and Palladio's antiquities of Rome. But it only wants a comparison of Inigo Jones's work with that of Burlington and his successors, or a comparison of Wren's with theirs, to see how those two men were really architects, while the others were but amateurs dabbling in what they did not thoroughly understand, and into the details of which they scorned to enter. But while in the true essentials of architecture they were sadly lacking, yet they produced striking results. One of these fine palaces, when it was surrounded by its original gardens, must have been remarkably imposing. Take Blenheim, for instance. If we regard it as a home, we must be disappointed; but as the dwelling of a great noble, living in state and surrounded with all its attendant ceremony, receiving other great nobles with their retinues, and housing them in more magnificence than comfort, in these respects it has much to claim our commendation. There is much excuse for it in the fact that it was a gift from the nation to its greatest son; it had to be splendid at all costs—yet it did not meet universal appreciation even in those days. Great as the progress in architecture has been within the last 40 years, it has either been imitative or eclectic. We want it to be neither, for imitation architecture proclaims that we admit the superiority of our predecessors, and eclecticism is but the pillaging of former architectures and rearranging the pieces; while what is wanted is either a new creation or a new and superior development. We cannot dwell on the gardens that surrounded these great houses, but they were an acknowledged part of the general design, and now that they have in most cases disappeared, the vast houses lacking their support seem more wanting in common sense than they otherwise would. Among the illustrations in Campbell's "Vitruvius Britannicus," which may be considered as the epitome of the period under discussion, there are not a few showing the lay-outs round the great houses, which were founded partly on Dutch and partly on French examples. It was, however, probably Versailles that set the example to our English nobility, though nothing was done here on so vast a scale. The Duke of Montagu, who was Ambassador at the French Court for a number of years at the end of the 17th century, occupied the first few years of the 18th, after his return, in "erecting his seat at Boughton, in Northamptonshire, after the pattern, and as his dimensions would allow, after the very model of Versailles." Boughton House is a very plain copy—or, rather, reminiscence—of Versailles; at

the same time, its garden and wilderness were of unusual magnificence and size, and adorned with numerous statues and a considerable extent of canals and ornamental water. The house itself, although of a rather plain and sombre cast, is interesting as an almost unaltered example of an 18th-century mansion, simply though richly furnished. Its floors are polished, its walls panelled in large panels surrounded by a bold bolection moulding, the doors are lofty and set in thick walls, the chimneypieces are simple and massive, and surround wide and deeply-recessed open fireplaces. The ceilings are (many of them) by that rather dull painter, Verrio; still, they impart a large amount of character to the place. Here and there is a panelled room, or a fine chimneypiece of a hundred years before, showing that the house was not erected entirely new by the ducal ambassador. The walls are hung with ancient portraits and pictures, and the floors are full of ancient furniture. There are attics innumerable scattered in every direction, and approached by staircases where the handrail is mitred round the plain square newels, and twisted balusters join it to the swelling string. Through these attics you may go, and down a different staircase, to find yourself in a room that you thought was a furlong off on the other side of the house. Altogether an interesting place, and one that gives a good idea of the haphazard arrangement of a large 18th-century house. At any rate, Boughton House was a home which could be inhabited all the year round—even the state-rooms, which is more than can be said of many of its contemporaries. Nevertheless, with all their drawbacks, these palaces were stately. The plans look gorgeous on paper, and so do the sections showing the internal decoration. When we leave the mansions of the nobility, and come down to the houses of the squire or the well-to-do merchant, we find ourselves in a much pleasanter atmosphere. They have a quiet dignity about them which is decidedly restful and attractive, especially those of the first quarter of the century. In later times the portico idea became too prevalent, which consisted in affixing to the front of an otherwise plain house some variation of the columned front of an ancient temple. But the earlier houses, with wide corniced eaves, simple horizontal strings dividing the rows of sash windows, and combining with the quoins that emphasise the angles; these will no doubt long continue to form the model for houses of similar use and capacity. It is just a question whether this is quite the type that suits the present age; for our wants seem to grow always more complex, and to require a more elastic style than one depending for its effect on strict symmetry and unbroken horizontal lines. If we cannot take a wholly sympathetic view of the purely architectural work of the 18th century, neither can we forget that we are indebted to it for much that is suggestive in the work that embellished the architecture, especially in wood and iron. The ironwork of that period has never been equalled in England, and it lends an air of distinction not only to great houses like Drayton, in Northamptonshire, but to little suburban villas at Hampstead. The joiner's work of the time is full of suggestions. The sash-window alone was enough to revolutionise architectural treatment, and the far-reaching effects of a mitred moulding are impossible to follow. Through all the changes of two centuries these two facts have remained with us—sash-windows and mitred mouldings—and there seems no immediate prospect of their being superseded. The work of the plasterer was not so admirable as that of the joiner. He had become too expert, and was able to perform prodigies of modelling and high relief, which finally undid him, and he and his art perished together. If we are to seek inspiration from the work of the 18th century, we shall find it in two directions. First, in the grand schemes of house and garden combined, and in the general grandeur of treatment bestowed upon the great houses of the time. Not that we are to copy either blindly; but it is very desirable to realise how much the house and its surroundings depend upon each other, and equally desirable to learn how a grandeur of manner may be acquired. Secondly, in the sober and simple houses, where the plainness of the general appearance is sometimes unexpectedly broken by the quaint treatment of a door or a chimney, and where the joiner's work is full of homely lessons. It is often from the vernacular architecture of the country that we can get the most useful hints; whereas it is the palatial architecture that gives its stamp to the period, and goes to furnish the textbooks. The



one is for show first, and use second; the other is for use first, and show second. The palatial architecture of the 18th century was surely given to us more as a warning than as an example; but it is worthy of attention, just as all phases of architecture are which have attained any hold on public affection, and we are not likely, in view of our present methods of study, to fall into that attitude of mind towards any style which Evelyn exhibited towards Gothic. If we bear in mind that architecture must develop from within, and not from without, we shall never again become the slaves of a foreign and a dead hand, as our fathers were in the 18th century, but we shall go forward, on different paths, perhaps, and at different rates of speed, but always towards the same goal—the ennobling of our *Alma Mater*, the Mother-Art of the world.

Mr. J. M. BRYDON proposed a vote of thanks to Mr. Gotch, and Mr. E. W. MOUNTFORD, past president, seconded it.

Mr. HENRY LOVEGROVE, in supporting this vote of thanks, alluded to the panelled walls and excellent joinery to be seen in the smaller houses of the period in the Metropolis.

Mr. HAMPDEN W. PRATT and Mr. E. HOWLEY SIM having spoken, the CHAIRMAN summed up the discussion, and Mr. Gotch replied.

#### STABLE CONSTRUCTION AND SANITATION.—VII.\*

IN large establishments it is desirable that one or more of the sick-boxes should be provided with a set of stout hooks and belaying-pins, so that an injured horse may be readily slung when necessary. A hot and cold horse-bath is also a very useful adjunct to the infirmary boxes. It should be capable of being supplied with water heated to about 160° Fahr. if required, so that in an emergency it may be used as a steam-bath for veterinary purposes.

A forge and shoeing-shed is generally provided in connection with stabling intended to accommodate a large number of horses. The former building is equipped with bellows, anvils, water-troughs, bench, vices, &c., according to the requirements of each particular case. Both the smithy and shoeing-shed require to be well lighted and ventilated.

The forage stores should be kept quite distinct from the stables, care at the same time being taken that they are perfectly dry and well ventilated. Where the stores are placed over the stables, they should be separated by a thoroughly impervious floor, so that the fodder may not in any way be contaminated by the emanations from below. For convenience in calculating the size of store-rooms necessary to contain a given quantity of forage, &c., the following miscellaneous memoranda will be found useful:—

A load of hay = 36 trusses = 18 cwt.

A load of straw = 36 trusses = 11½ cwt.

A truss of hay = 56lb. = 10c.ft. approximately.

A truss of straw = 36lb. = 10c.ft. approximately.

A cubic yard of hay compressed for shipping = 270 to 300lb.

A bushel of good oats (new) should weigh not less than 38lb.

A bushel of good oats (old) should weigh not less than 42lb.

A bushel of good beans should weigh not less than 62lb.

A bushel of good barley should weigh not less than 50lb.

A bushel of good maize should weigh not less than 60lb.

A bushel of good oatmeal should weigh not less than 47lb.

A bushel of good peas should weigh not less than 62lb.

A bushel of good wheat should weigh not less than 60lb.

A cubic yard = 21 bushels.

A bushel = 1·284 cubic feet.

8 bushels = 1 quarter = 10½ cubic feet.

Cowhouses, for a single row of stalls with feeding passage, should have a total width of about 18ft., as shown in Fig. 48. This allows a feeding passage 3ft. 6in. wide, feeding trough 2ft. wide, with stalls or "standings" 7ft. 6in. long, and a 5ft. passage (including gutter) at rear. In the case of cattle it is usual to house them in pairs, so that a stall division is provided between every two cows. The width of a double stall should therefore not be less than 7ft., in order that a minimum breadth of 3ft. 6in. may be allowed for each animal. Where circumstances

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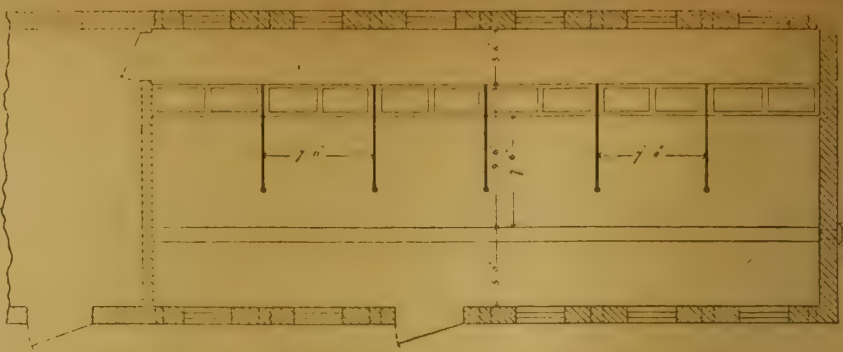


FIG. 48.

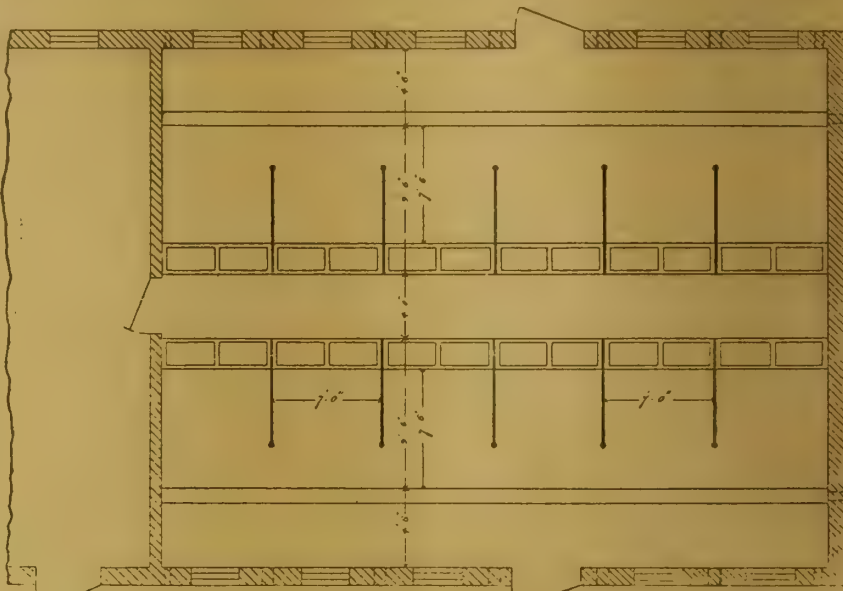


FIG. 49.

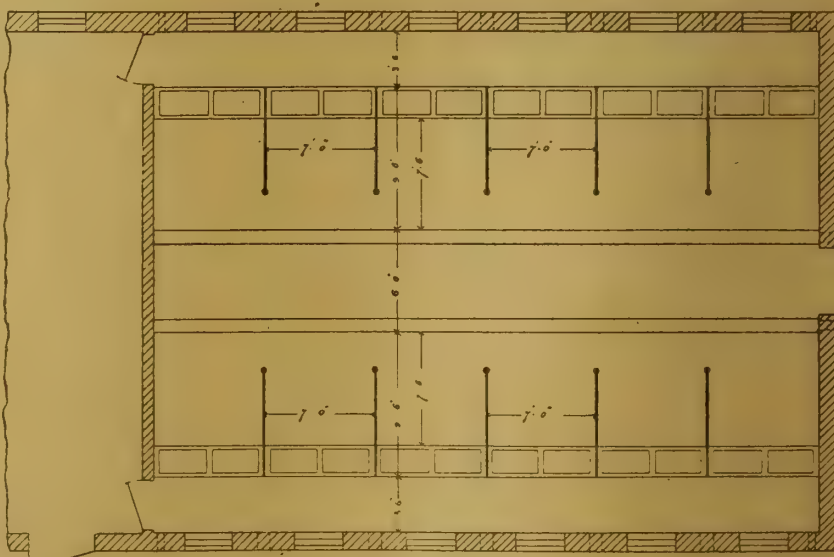


FIG. 50.

permit, especially when it is intended to accommodate stock of large size, it is better to make the stalls 7ft. 6in. or 8ft. wide. Occasionally cowhouses are arranged with separate stalls for each cow, and for this purpose they should be not less than 4ft. 6in. wide. Where this method is adopted a few double cow-stalls should be provided for use in calving time, unless loose boxes are available. The most satisfactory arrangement for a large cowhouse consists of a building designed with a double row of stalls, as in Fig. 49. This gives a central feeding passage 4ft. wide, two rows of stalls 9ft. 6in. long, including mangers, with a 4ft. 6in. passage at the rear of each, making a total width of 32ft.

For convenience of serving, a light tramway is frequently laid throughout the length of the feed-

ing passage, having direct communication with the forge and roof stores.

Fig. 50 is the plan of another arrangement, for a double cowhouse with a separate feeding passage for each row of stalls. The total width is 32ft., and is made up of a central passage 6ft. wide, two rows of stalls 9ft. 6in. long, with a 3ft. 6in. feeding passage to each. Of the two plans, that shown in Fig. 49 is the most convenient.

Fig. 51 is similar in general construction to that shown in Fig. 50, except that the feeding passages are entered from the ends of each row of stalls, instead of separate entrances being provided from the root or other store attached to the cowhouse.

Where economy is the first consideration, the feeding passage is sometimes omitted, as in



Fig. 52. Cowhouses of this type are, however, very inconvenient, owing to the difficulty experienced in properly feeding and serving the cattle when the stalls are fully occupied.

#### WATER SUPPLY.

Whilst it is essential that an ample supply of water should be available at all times for various purposes, it is also necessary to remember that the character of the water supplied for drinking will exercise an important influence on the health of the animals for whom it is provided. It need scarcely be stated that all drinking water should be perfectly free from any contamination with sewage and other foul matters; for, not only is the health of the animals themselves endangered, but in the case of cattle supplied with impure water, many serious diseases may be directly transmitted to human beings through the medium of the milk.

Where the choice of drinking-water is left to the animals themselves, it will be found that they invariably choose the soft waters of rivers or lakes in preference to the hard waters of deep wells, &c. For potable purposes, the most wholesome water, either for men or animals, is pure rain-water; but, unfortunately, in practice, rain-water is too often rendered impure by contamination with dirty collecting surfaces, or by being allowed to stagnate in ill-ventilated and neglected tanks containing a large amount of sediment and dirt. Owing to the waters from rivers and small lakes being liable to be fouled with sewage and other impurities, as a rule it is generally advisable to rely upon deep well water or water supplied from a local water company for drinking purposes.

The classification of waters derived from various sources, according to their relative fitness for drinking, as given by the Rivers Pollution Commissioners, is shown in the following table, viz. :—

TABLE SHOWING RELATIVE FITNESS OF VARIOUS WATERS FOR DRINKING PURPOSES.

Source.	Fitness for Drinking.	Palatability.
1 Spring water .....	Wholesome	(Very palatable.
2 Deep well water .....	Ditto .....	Ditto.
3 Upland surface water .....	Ditto .....	(Moderately palatable.
4 Stored rain-water .....	Suspicious.	Ditto.
5 Surface water from cultivated land .....	Ditto .....	Palatable.
6 River water to which sewage water gains access .....	Dangerous	Ditto.
7 Shallow well water .....	Ditto .....	Ditto.

The arrangement of these waters in the order of their softness is as follows :—

TABLE SHOWING RELATIVE SOFTNESS OF VARIOUS WATERS.

Source.	Degree of Softness.
1 Stored rain-water .....	Very soft
2 Upland surface water .....	Soft
3 Surface water from cultivated land .....	Ditto
4 River water .....	Hard
5 Spring water .....	Very hard
6 Deep well water .....	Ditto
7 Shallow well water .....	Ditto

Water is called hard when it holds in solution a certain proportion of salts of lime or magnesia; those most commonly met with are salts of lime, such as carbonate of lime and sulphate of lime. Carbonate of lime is almost insoluble in pure water, but it easily dissolves in water containing carbonic acid. The comparative hardness of water is measured by the number of grains of dissolved saline matters present in a gallon of water (or 70,000gr.), each grain being called a "degree"; for instance, water containing 12gr. of chalk per gallon is said to have 12° of hardness. Waters which do not exceed 5° of hardness may, for ordinary purposes, be considered as soft, and when exceeding 12° as hard. The following gives the average degree of hardness of certain descriptions of waters :—

Upland surface water .....	5°
River water .....	12°
Spring water .....	26°

Where the hardness of the water is produced by carbonate of lime held in solution, it is known as a "temporarily-hard water," for the greater portion of the chalk may be removed by boiling, and the water thus rendered comparatively soft; when such water is boiled, a large part of the carbonic acid is driven off and the excess of carbonate of lime is deposited on the sides and bottom of the

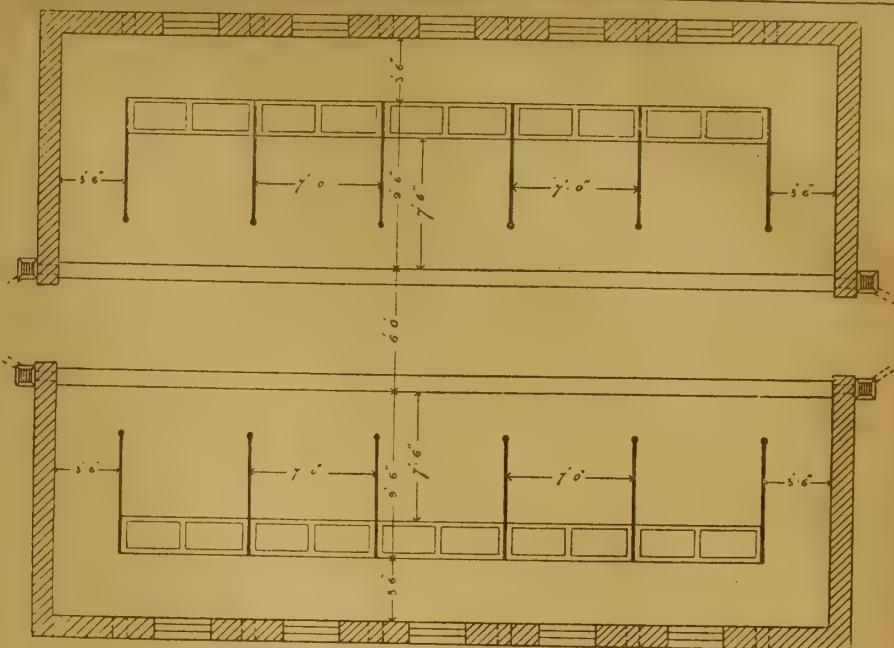


Fig. 51.

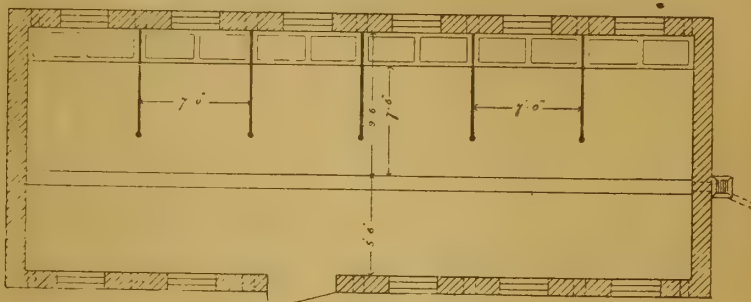


Fig. 52.

vessel. The incrustations of carbonate of lime or chalk which occur in kettles and boilers are matters of everyday observation, and are illustrative of the process of softening a "temporarily-hard water"; on the other hand, if the hardness of the water is due to dissolved sulphate of lime, then such waters are called "permanently hard," for no amount of boiling will soften them.

The degree of hardness of water is ascertained by means of Clarke's soap test. Advantage is taken of the fact that soap when mixed with a hard water (i.e., water containing salts of lime or magnesia), is readily decomposed, the oil or fat in the soap combining with the lime or magnesia to form insoluble compounds which are seen floating in the water in the shape of multitudinous, light, flaky particles; if sufficient soap is added the whole of the lime and magnesia is eventually precipitated.

Clarke's standard soap solution consists of soap dissolved in alcohol; the quantity of soap in the solution is accurately known, and a definite amount of the solution is gradually added to a measured quantity of the water to be tested. When these are well shaken together no permanent froth or lather will be produced until the whole of the lime and magnesia has been precipitated. From a calculation of the quantity of standard soap solution used in order to produce a permanent froth or lather, the quantity of lime and magnesia contained in the water, and consequently the degree of hardness, is ascertained.

Some stablemen will occasionally go through the operation of partially washing their hands in a bucket of water, although their hands may be quite clean, and after removing the scum which has formed on the surface, will give the water to their horses to drink. By this means the water is slightly softened, although the rationale of their proceedings may not always be obvious to them, nor is such a method of softening water for drinking purposes to be recommended.

Animals supplied with very hard waters for drinking purposes are liable to various intestinal disorders, and the harsh, dry coat of horses frequently results from the same cause; for racers, hunters, and other valuable horses, it is desirable that very hard waters should be softened, either

by boiling or by subjecting the water to some other softening process. In the method introduced by Dr. Clarke this is effected by the addition of a saturated solution of lime to the water to be softened, the excess of carbonic acid present in the water being thereby neutralised, so that a solid precipitate of chalk is obtained.

A horse of average size will drink from seven to eight gallons of water per diem, whilst about three gallons will be required for washing purposes, in addition to which an allowance of five or six gallons per horse is necessary for stable cleaning, &c.; provision should, therefore, be made for a minimum daily supply of 16 gallons per horse for drinking, washing, and stable-cleaning purposes.

Cattle require from five to six gallons of water per day, and, for all purposes, the total supply for cow-houses may be estimated at 12 gallons per head per day.

In districts, where there is a great scarcity of water, the rain-water from the roofs may be stored in a water-tight, well-ventilated, underground tank, the rain-water first passing through a small settling and filter-chamber; both the settling chamber and filter-chamber and storage-tank should be frequently inspected and periodically cleansed, and the whole so designed that there may not be the slightest danger of the water being polluted by sewage or other matters of this nature. A storage-tank with cement concrete sides, and roof not less than 18in. thick, well-finished on the inside with cement rendering about 1in. thick, the surface being brought to a perfectly smooth surface with neat cement, will be found to provide a watertight reservoir.

A water-basin frequently forms an integral part of the manger-fitting, the water supply being regulated by means of a specially-constructed tap, whilst the waste-pipe from the basin discharges upon the surface-channel of the stall; for ordinary stables the water-basin is, however, omitted, the horses being supplied with water by hand when they require it, either by taking the animals outside and watering them at stated times or allowing them to drink in the stable from a bucket.



## BUILDING TRADES EXHIBITION.

THE Exhibition was opened at noon on Saturday by the Lord Mayor, who was accompanied by the Lady Mayoress and the Sheriffs. The civic party attended in semi-State, and were received at the hall by Professor Banister Fletcher, J.P., F.R.I.B.A., and Mr. H. Greville Montgomery, on behalf of the consultative council and the management of the Exhibition. Among others present were Sir Arthur Blomfield, A.R.A., the Hon. W. F. B. Massey-Mainwaring, M.P., Mr. William Woodall, M.P., Mr. Henricker Heaton, M.P., Herr Mutesius (Technical Attaché of the German Embassy), Mr. Thomas Blashill, F.R.I.B.A. (L.C.C. Architect), Mr. Ernest Benedict, M.I.C.E., Mr. J. P. Seddon, Mr. Ellis Marsland (Hon. Sec. S.A.), Mr. H. Lovegrove, V.P.S.A., A.R.I.B.A., Mr. Charles Barry, F.R.I.B.A., Mr. John Belcher, F.R.I.B.A., Mr. G. M. Callender, and Mr. E. J. Kibblewhite. Professor Banister Fletcher addressed a few fitting words of welcome to the Lord Mayor, who remarked that he was always pleased to assist in any object that would promote technical education and advance the building trade of this country. The more that was done to foster such movements as these the better it would be for the commercial interests of the country. During the last 25 years London had been the most magnificent and the most progressive city in the world, and there was no doubt that the great decrease in mortality was as much due to the sanitary improvements which had been effected in their houses, as to the great strides which science had made in therapeutics, in surgery, and the whole art of healing. By fostering these exhibitions they would help to beautify the city of which they were so proud, and to make their homes sanitary, comfortable, and free from draughts—a consummation devoutly to be wished for. The civic party then made a tour of the Exhibition, under the guidance of Mr. H. Greville Montgomery, the projector of the Exhibition, who afterwards entertained the party to luncheon, when several short speeches were made. Mr. Woodall responded for the House of Commons, and Mr. E. J. Kibblewhite for the Press, the latter remarking that he hoped a successful show like the present would one day lead to the establishment of a permanent museum of building appliances, which Mr. Greville Montgomery was undoubtedly the man to organise, and that meanwhile all might depend that the Press, which knew well enough the difference between a genuine exhibition and a mere bazaar half-filled with sweetstuffs-stalls and other rubbish, would heartily recognise his efforts to make the one they had met to inaugurate worthy of the great industries represented. In the afternoon a large party of about 100 members of the Architectural Association visited the Exhibition, and were also entertained.

On Monday afternoon and evening a

## CONFERENCE OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

was held in the building. After inspecting the exhibits the visitors had tea together, and re-assembled in the conference-hall, about a hundred members being present from all parts of the country, to discuss the question of

## PAVING AND ROAD-MAKING MATERIALS.

Mr. H. Percy Boulnois, M.Inst.C.E., city engineer of Liverpool, past-president, occupied the chair, and was supported by the president, Mr. F. C. J. May, borough engineer of Brighton; Mr. Lewis Angell, of West Ham, treasurer, and others. The Exhibition of Road Materials from all parts of England, brought together by the editor of the *Surveyor*, Mr. Thompson, and shown in a bay of the gallery, were described by Mr. C. H. Cooper, A.M.Inst.C.E., engineer to the Wimbledon Urban District Council. He explained that almost all classes of road-making were shown, including granites from Cornwall, Pwllheli, Leicestershire, Cleve Hill, Guernsey, Cherbourg, and Norway; Devonshire limestones and marbles, blue Pennant from Clevedon and Bristol, Kentish rag, flints, and gravel, hardwood blocks from New South Wales and Western Australia, and artificial clinker slag-paving, as made from refuse, and used in Liverpool, Lynn, and Hampstead. The discussion which followed was opened by the president, Mr. May, of Brighton, who referred to the work going on in that borough. Mr. Charles H. Low, of Hampstead, explained that artificial paving slabs fit for paving were made

from refuse-destroyer clinkers at his vestry's dust-destroyer works at Willesden, which, although not equal to Victoria or similar stone, was far superior to the wretched hoggins so common in suburban London, and although it was inclined to get slippery by wear, was durable, especially if faced with cement, and withstood heavy traffic. Mr. E. G. Mawbey, of Leicester, gave his experiences in that town with destructor clinker, which was only used for lower layers. The committee of the Leicester Corporation thought that, owing to repairs of pavement always in progress owing to electric cable and gas and water-main renewals, that the time had gone by for *in situ* paving, and they were about to revert to slab paving. Mr. H. A. Garrett, of Torquay, referred to Devonshire limestones used in his locality for making carriageways. In Devon they had a surfeit of limestone, and although it was admittedly soft, hitherto cost had prevented the use of better materials; but the time had come for using more durable road surfaces. The grave defect of limestone was that in wet weather it was churned into a soft creamy mud, and, therefore, although excellent in dry summers, was not desirable in wet weather. Babbicombe limestone was magnificent for use in concrete. In Torquay they laid their footpaths in concrete *in situ*. Local limestone could be got at as little as half a crown a ton; but in the long run it was more costly to maintain than granites. Mr. Charles Mason, St. Martin's-in-the-Fields, W.C., suggested that at a future exhibition samples should be exhibited of binding materials for granite and wood. Mr. J. W. Butler, of the Imperial Stone Co., described the products of his firm, which had recently been improved; but was promptly called to order by the chairman. Mr. Charles Darbyshire, of the Pennmaenawr Quarries, suggested that in a future building exhibition the various classes of stone should be arranged in localities and classes in bays along a single gallery, so that they could be compared more easily than if spread over the place. Mr. Knight thought it would be most valuable thus to bring road materials together. The man who could discover a noiseless paving comfortable for horses and durable to traffic had not yet been born. It would probably be of an indiarubber character.

The chairman, in closing the discussion, described the Carnarvonshire granites, Yorkshire flagging, and the béton concrete, specially used in Liverpool. For clinker paving he made the latter under pressure, and added nothing to it, not even sand or cement. It was laid three months after manufacture, and though never used for main streets, as not being sufficiently durable, it answered well for back thoroughfares; it gave a good foothold and was slightly porous. Its dark colour was against it, but as a waste product of a waste product it was interesting. A monolithic pavement could be laid cheaply and quickly, and for some large areas it was desirable; but there were two difficulties—one, that it could not be laid in frosty weather, and when broken up for pipes, it was very difficult to repair. The surface-picked flint made a better and more durable stone for roads than that derived from quarries, as it had a natural face. In Portsmouth he had used a great deal of Purbeck marble; but it was slippery, and Yorkshire grits were far preferable. If it were not for slipperiness under traffic in certain conditions of weather, asphalt would be an ideal paving, as being impervious, elastic, noiseless, and easily repaired; they were looking forward to the halcyon period when the motor-car had replaced the horse, when asphalt would be the best paving material, but at present hard wood most nearly fulfilled the conditions. Mr. Cooper briefly replied, and "An Apparatus for Testing Stone," contributed by Mr. Thomas Clark, surveyor to the Truro Rural District Council, was taken as read.

## CLAYWORKERS' INSTITUTE.

The third annual meeting of this Institute was held at the conference-room on Tuesday afternoon, Mr. Edgar Webster, of West Bromwich, chairman of committee, presiding. The report of the committee, read by Mr. Callender (hon. sec.), stated that the membership was steadily increasing, the present roll including 151 names, as against 106 at the end of last year. A benevolent fund had been started during the year, and the sum of £14 12s. 6d. had been given, and was in the hands of the three trustees, Messrs. F. Webster, Montgomery, and Callender. Mr. C. B. Broad, of Cowley, had been elected a member of

committee in the stead of Mr. H. Knowles, resigned. The offices of the Institute had been removed from 222, Strand, to 43, Essex-street, Strand. The basement of the new premises had been fitted up as a show-room for heavy materials, a room on the first floor being arranged as a general museum for samples of bricks, and another as a call-room and for general business purposes. Progress had been made during the year with a movement for obtaining the co-operation of the various associations in the brick trade throughout the country. Mr. William Blades, J.P., of West Bromwich, proposed the adoption of the report, which was agreed to. On the motion of Mr. W. A. Smith, of Northampton, seconded by Mr. F. Jewson, J.P., of Earith Bridge, Hunts, the following officers were elected for the ensuing year:—President, Sir Alfred Hickman, M.P., Wolverhampton; vice-president, Ernest Spencer, M.P., West Bromwich. Committee: C. B. Broad, of Cowley, Oxford; J. W. Courties, of Cardiff; S. George Collier, of Reading; G. T. Curry, of Gray's, Essex; G. Carter, of Poole; E. Holwell, of London; S. Smith Harvey, of Newton Abbot; F. Jewson, Earith Bridge; J. Knox, Nuneaton; G. H. Rogers, of Nuneaton; H. L. Stinson, of Ashby de la Zouche, and Edgar Webster, of West Bromwich. Hon. secretary, G. M. Callender; hon. treasurer, H. Greville Montgomery; hon. solicitor, Stephen Bird. The chairman announced that an excursion would be made at Easter, commencing on April 16, to the brick-fields of Belgium. A discussion followed on the incidence of rating, and the best means to prevent injustice, in which Messrs. Blades, Courties, Jewson, Broad, Knox, Rogers, and others took place. The members afterwards dined together, under the chairmanship of Mr. Webster, about 50 sitting down.

On Wednesday afternoon, the members of the Builders' Merchants' Association of London visited the exhibition, and afterwards held a conference, and last (Thursday) evening a similar visit and conference of house-painters and decorators took place. The awards of prizes in the bricklaying, carpentry, plastering, and other handicrafts competitions will be made known to-day (Friday), and to-morrow evening at 5 p.m. Sir Arthur Arnold will distribute the prizes to the successful craftsmen competitors.

We now resume our notices of the exhibits.

The Ratner Safe Co., Ltd., Moorgate-street (Row A), have a most interesting display of the Ratner patent drill-proof, banker's strong-room door. The most attractive feature is a scarlet plush-lined safe, to be used for the custody of the solid gold Communion-plate given by Mr. Hooley to St. Paul's Cathedral for the Queen's Jubilee. The improved iron doors, with jointless stiles and rails for party-walls, should receive attention of all architects and manufacturers who are about to build warehouses and stores. Some hundreds of them have been used in the Army and Navy Stores, and other warehouses.

A special position in Row B is taken by the stand of the United Asbestos Co., 158-60, Charing Cross-road, W.C., where architects will find many admirable specimens of the patent "Salamander" decorations of this company suitable for walls, ceilings, friezes, dadoes, &c. The erection shows this valuable fireproof and decorative material applied to the walls and ceiling, in plain white or coloured, and in both low and high relief. The "Salamander" decoration is now so largely used for its light fireproof qualities and its easy application to walls and ceilings, that it is needless to dilate upon its merits. As made from a fire-resisting substance, or mineral fibre, it seems one of the only safe coverings for modern buildings; but the company have added the resources of art in rendering the material highly decorative, that it cannot be distinguished from the best modelled and relief plaster. It is easily hung, and the price is low. A well modelled dado in bold relief and several very admirable ceiling patterns in high and low relief are on view.

Messrs. Peters, Bartsch, and Co., Derby, and of Queen-street, Cheapside, whose patent for the prevention of boiler incrustation we noticed last week, have a stand, 58 in Row B, where they exhibit several specimens of timber and wood protected by their invaluable "Carbolineum Avenarius." We saw some test specimens of red deal, treated and untreated with the preservative, which were prepared under the supervision of a railway company's officials, demonstrably proving the protective influence of the



Carbolineum, which can be simply applied by a brush. The unprepared specimens were much decayed and eaten away, the scantlings reduced in substance; while the prepared specimens, of similar pieces, are as sharp and undiminished as if they had just been sawn. The preservative has the great advantage of giving a rich nut-brown colour to the wood, admirably adapting it for gates, doors, half-timber work, and all external purposes. It has been extensively used by many of the railway companies for wood-block paving, and the company have used it in Northumberland-avenue amongst other parts of the Metropolis. Several polished specimens are shown in which the Carbolineum is used as a stain. Stone and stucco are hardened by its application. It is cheaper than paint. A split block of wood treated shows that the solution enters some depth into the fibres of the wood, though it does not stop up the pores. The "Prism Antioxide" is another protector of paint on wood or iron, and a preventive of rust; and we must also notice the indestructible combination washers for flange joints of steam and water pipes, on which a packing of asbestos or hemp is inserted in rings of soft metal, which have been tested up to 2,300lb. pressure.

Messrs. Messenger and Co., of the Midland Horticultural Works, Loughborough, Leicestershire, Victoria-street, Westminster, exhibit an open stove-house, fitted with their iron sill and iron imperishable stage, with rafters grooved for carrying away condensed moisture, which is conveyed from the glass by specially cut joints at the laps. The opening apparatus, shown in action, by which the side and upper lights are opened, we lately described. We have seen nothing so effective as the motion of the lever which actuate the sashes; long lengths of roof and side lights can be operated by this system. The iron sill is an excellent substitute for the perishable wooden sill.

Adjoining this stand, the Cameo Wood-Working Co.'s exhibit ought specially to be noticed. The very effective and beautiful ornamentation which this company show deserves attention by all architects, builders, decorative artists, and the public. The pattern is pressed into the grain of the wood by rollers, and the surface slightly apparently burnt, so as to assume a rich brown colour, which gives the effect of a cameo-like relief to the ornament. We saw several panels of various shades of colour, friezes, dados, enriched mouldings, doors, and chimney-pieces treated in this manner, which were very decorative in effect. For electric wire casings it is admirably adapted, as the covers can be enriched with ornament along ceilings and walls, and for the casing of girders or beams no better decoration can be obtained. For picture-frames and rails, the cameo treatment is also inexpensive and effective.

Messrs. Candy and Co., Ltd., of Queen Victoria-street, and Heathfield Station, South Devon, occupy a special position with a collection of their well-known white and coloured glazed bricks, buff vitrified terracotta, and plain and ornamental facing-bricks of a very hard, superior quality. We notice particularly the excellent make of the glazed bricks, stretchers, and headers, also suitable for jambs with rounded corners; these are made in white, cream, brown, grey, black, and all colours. The display of sanitary ware of superior glazed quality—the stoneware drain-pipes, junctions, street gullies, and safety-traps—are well worth the architect's and engineer's inspection. The buff vitrified stable and paving bricks are very hard and well-made goods. We refer more particularly to the vitrified paving bricks without cross grooves supplied to the War Office, and noticed by us last week, also the terracotta work, which will well repay the architect's attention.

In Row F, at the top, Mr. B. T. Batsford, of High Holborn, exhibits a collection of several of his well-known architectural and students' publications. The books on technical and building subjects are well selected, and if the country architect or student, in search of books of this description, who has come to the exhibition, will just look over this stall, he will find treatises on plastering, plain and decorative modelling; hand-books of ornament, art-smithing, furniture, carved woodwork, and decorative work generally; and many new practical manuals as Mitchell's "Building Construction," Professor Banister Fletcher's valuable textbooks on "Quantities," "Light and Air," "Dilapidations," "Estimating and Repairs," and other practical works

on construction, plumbing, sanitary, and other matters. The provincial architect and student cannot do better than to pay Mr. Batsford's stall a visit.

In Bay I. Messrs. Shanks and Co., the eminent sanitary engineers of Cannon-street, exhibit several improvements in closets, lavatories, baths, &c. Shanks's patent "Levern" siphonic closet, with the patent Dicksee arrangement for slops by which the emptying of slops does not unseat the trap, is a great sanitary safeguard. Other wash-down closets made by this firm are seen, and a patent "combination" closet and cistern, and several excellent patented lavatories with accessible waste fitted on brackets, very clean and useful, suitable for offices, schools, shops. We notice also the "Independent, plunge, spray, and shower-bath"—a handsome and portable arrangement.

Bay 5 is occupied by samples of Callender's pure bitumen dampcourse (Exeter-street, Strand), wall and arch linings, and other applications, which every architect and builder should visit. One of the models shows a brick railway arch illustrating the mode of laying the bitumen; another shows a brick tank lined with Callender's bitumen sheeting and cement above, making a perfectly water-tight tank. The application of the sheets to vertical walls and basements is shown by large models, finished with plaster and expanded metal lathing or matched boarding. The model of wall with dampcourse standing in water is an ocular demonstration of the impermeability of the pure bitumen dampcourse. Engineers and electricians will find much to interest them in the models of Callender-Webber casing and electric-light cables of various types, junction boxes, and underground cables. These are of great insulating power, and show many improvements. Bays 8 and 8A are occupied by the Institute of Clay-workers, of 43, Essex-street, Strand, the object of which is to promote the interests of this large and varied industry by bringing together employers to discuss matters of interest to the trade. The *British Clayworker*, the organ of the brick, tile, and pottery trade, is doing a useful work in this connection, and its pages are worth the perusal of all manufacturers, architects, and others. Near by is a bay occupied by a selection of illustrations from the *BUILDING NEWS*. A fine doorway and porch of the Corinthian order, with pedimental canopy, removed from an old house in Great Ormond-street, dated 1707, is to be seen in Bay 9, lent by the South Kensington Museum authorities, who have also bays in the Gallery. It is a very rich example, with broken entablature over the fluted columns, modillions all in carved wood.

In Bay II., Messrs. John Knowles and Co., manufacturers of stoneware pipes, King's-road, St. Pancras, N.W., shows several examples of their "vitrifine" stoneware pipes, very hard, well-made goods. The patent "Anti-Vap" street gully is a decided improvement for streets, as it gives a deep well for all sediment, and would require to be cleaned out much less often than the ordinary street gully. This is effected by placing the outlet high up; which, besides giving a good deep receptacle for detritus, gives a better outlet for an overflow in heavy rains, as it is not so likely to stop up with mud. Engineers and surveyors would do well to look at this gully, and the "vitrifine" pipes, which have stood severe tests. The "Aquarius" wash-down closet is also worth notice; the rotary outlet allows an easy fixing of the closet to any angle, and ease of inspection. The joint of the outlet is an annular groove, into which the spigot of bend or junction is inserted, the groove being filled with liquid cement.

We must note also the exhibits of Messrs. Dent and Hellyer, of 2, Newcastle-street, Strand, who show Mr. Hall's patents. The Hellyer patent cast-lead anti-D traps are well known in the trade as one of the most cleanly and perfect traps. They are self-cleansing, and are without solder; they are also non-siphoning, thus combining all the essentials of a sanitary trap.

A special position—No. 12 in Row C—is occupied by Messrs. Bratt, Colbran, and Co., of the Castle Foundry Co., Finsbury, E.C., where we notice a very artistic selection of well-designed wood chimneypieces, stoves, tiled hearths and jambs, metal-work, iron and marble chimneypieces, and ranges. We particularly draw attention to the white-and-cream painted wood chimneypieces, with tile-hearths of quiet design and colour, and

the stoves with firebrick backs, of excellent appearance and economical in fuel consumption.

Conspicuous as an exhibit is the Waller "Grip-fast Tile" Co., Ltd., in Row D (81 and 82), a model building erected showing the covering with Waller's patent "grip-fast tile," much superior to tiles produced by hand-pressure, and well worth the attention of all architects. The cement tile has stood a long test on the Continent, and with the dovetail grip and water-drip channel introduced in this tile, nothing can be more water-proof and wind-proof. These tiles are composed of the best Portland cement, sand, &c., made under pressure, and resist frost and other destructive agencies. We have examined the interlocking of these tiles in laying, and by the ingenious arrangement of the grooved fillets and projections, the tiles fit close into one another, any moisture rising by capillary attraction between the tiles being carried off by the channels. They are self-fitting, require no boarding or felting, and are both wind, snow, and rain proof. The roof of the building is covered by the tiles, which are made in several shapes, and are laid to 6½ in. gauge.

Worth examination in Row B is a building of enamelled metal, by the Enamelled Metal Decoration Co., in which sheets of enamelled metal, slightly embossed, form the walls and ceilings. For lavatories and bathrooms this decoration looks very neat, clean, and is easily washable; blue and white or marble imitation, as in the dado, are the kinds chiefly seen in this exhibit.

As a development or process quite new, we may mention the "photo.-decorated tiles" shown in 15A Stand in A Row. By this process anything that can be photographed can be produced to any size and colour on tiles and fixed under the glaze. The tiles shown include views of buildings, of ruins, landscapes, places, portraits. As a wall decoration it has possibilities.

In the gallery (Bays 3, 4, 5, 6) will be found a very valuable collection of old woodwork, carvings, and other exhibits lent by the South Kensington Museum. In this collection we notice an oak panel in high relief carving of the legend of St. George and the Dragon, a very interesting specimen of the 14th century. Some carved oak panelling from a farmhouse at Kingstone, near Taunton (15th century) is an interesting example of the "linen" pattern panel, and near it we notice oak panelling and two pilasters from an old house near Exeter about 1600. A carved oak mantelpiece, frieze, and stone jambs, brought from a house in Lime-street, we have illustrated, also the stonework from Bromley-by-Bow palace. A chimneypiece from Sir Paul Pindar's house, Bishopsgate Without, of 18th century date; several panels of carved wood of the 17th century, friezes and cornices, electrolyte reproduction of a copper door, &c., may also be seen here. The Corporation of the City of London, who are interested in the Exhibition, send a collection of drawings and models illustrative of the Tower Bridge, which will be of general interest to visitors in Bay 7, and the Worshipful Company of Carpenters, who have appointed two of the judges for the handicraft competition to be held here, have a collection of models and old furniture (one the chair of the Master of the Company). We also notice the latest thing in posters, and designs sent in for posters for the Building Trades Exhibition, an interesting series of "artistic" posters, one or two quite "advanced" in conception.

A very instructive bay is No. 9, set apart for exhibits in various trades by the Trades Training School, Great Titchfield-street. Here we observe some capital work done by bricklayers and setters, masons and stone carvers, carpenters and joiners, smiths, plumbers, &c. To the architect and student Bays 10 and 11 will be found both interesting and instructive, for we have a good selection of drawings and designs by leading men in the profession. The designs include examples by the City Surveyor; some very spirited sketches and designs by Messrs. Ernest George and Yeats, F.R.I.B.A., H. Huntly Gordon, F.R.I.B.A., H. Hall, F.R.I.B.A., E. Woodthorpe, F.R.I.B.A., Professor Banister Fletcher, F.R.I.B.A., Jas. Neal, F.S.A., W. A. Pite, F.R.I.B.A., H. W. Brewer, F.R.I.B.A., J. B. Thorp, and Walter G. Penty. Another collection of architectural drawings, water-colour sketches, cartoons for glass painting, mosaic, &c., is shown by Mr. J. P. Seddon, F.R.I.B.A., including a chimney-piece and overmantel in walnut wood, with marble mosaic panels, designed by him and made by Messrs. Belham and Co. Those interested in stone, lime, cement, and kindred trades will be



glad to see copies of the *Quarry*, the organ of those trades, published at Essex-street, Strand. Copies of this publication are to be obtained in the bay 17 of the gallery.

Before leaving the gallery we must mention the instructive series of competitions prepared by the committee of judges, consisting of the science committee of the Institute of British Architects, Architectural Association, City Companies, &c., in the trades of masonry, bricklaying, carpentry, joinery, decoration, plastering, plumbing, and smithing. These are limited to British workmen. In the masons' competition, one subject set is the working of the two top stones of a jamb, with an arch-mould springing from its splayed end; the second is a small pediment springer in a wall of given dimensions. Each competitor makes his own joint moulds, and Ketton stone is used. In the bricklayers' section, an 18in. length of a brick-and-a-half wall with squint quoin 14in. long for bay window and reveal, eight courses high, is to be worked, and the building of four courses of 14in. work, showing reveal. In the carpenter's section, models of roof-trusses, framed partitions, tenon of binder to a girder, a diminishing stile to a glass door, lock-rail, &c., are amongst the questions. The prizes and certificates awarded in these subjects we shall notify next week.

#### "BUILDING NEWS" DESIGNING CLUB.

##### A SMALL TECHNICAL INSTITUTE.

THE Diamond Jubilee memorials throughout the land are assuming a variety of shapes, as might be expected, and educational pioneers are establishing technical schools in various parts of the country, as useful and befitting monuments of so auspicious an occasion. Their utility is by no means, however, always accompanied by an artistic architectural treatment, and the false notion still largely remains current that, because a building is planned to be useful, therefore it matters little if it be ugly. Local road surveyors and others, in no way qualified to design any building having the least claim to architectural importance, are employed for any other reason rather than that of fitness to prepare drawings for works of this kind, and as a consequence the results are disastrous. The two designs herewith illustrated were produced by students, and are given as such. We do not claim for either of them merits of a high order; indeed, that placed first is a commonplace performance so far as the exterior is concerned; but its plan is excellent, and the choice afforded by the designs submitted gave us no alternative. We placed "Nap" first, "Pickles" second, and "The Dingo" third. These were the conditions which we issued:—

##### FOURTH LIST OF SUBJECTS.

D.—A small Technical Institute for a country town of 5,000 inhabitants, to cost about £3,000, to be built on a level site, having a frontage of 120ft. facing the south; but the buildings are to occupy less than this width. The accommodation is to comprise, on the ground floor, a physics laboratory, 420ft. super.; a physics lecture-room about same size, but rather larger; a cooking-class room, 520ft. super., a scullery adjoining, and a pantry store. There must be a cloakroom and w.c. for each sex, and a secretary's office. Upstairs a large art-class room, a general lecture theatre, and a chemical laboratory with balance-room and store attached. Scale, 8ft. to the inch for elevations and section. Plans may be drawn 16ft. to the inch. View essential. Style, Renaissance. Material, brick and stone. Roof covered with tiles. A good entrance-hall is necessary, and a staircase 3ft. 6in. wide without winders. Elevation to set back 20ft. from the frontage line.

"Nut" would have taken a place among the first three, but for the fact that he has made the buildings too extensive, and, moreover, his plans are far from perfect; still, his work merits this recognition. "Nap's" design, prefaced as its introduction is by the note already made concerning its elevation, may be thought to call for some apology on its being awarded the leading position. We consider its compactness and adroitness of plan has no equal among the designs submitted, and in this respect it would want a lot of beating; while for suggestiveness, whatever its minor faults may be, the plan is undoubtedly the best. We do not like the roofing as shown by the section with the snow trap over

the landing hall, and the parapet is weak-looking and ugly. The entrance is the best part of the façade. "Pickles" is not so compact, and the general "hang" of his plan is not quite so good. Thus there is more space lost in passage-way, and the secretary is a little too much out of the way, for in such a small institution he would have to control the entrance and be in evidence. The yard connected with the cooking-room scullery might be an advantage. The one entrance to the big lecture-room is not enough, and is not well placed either. The exterior is better than "Nap's." "The Dingo" has a taste for the later English Renaissance, and his first thought seems to be in the direction of exterior design. We should be sorry to say a word to damp his enthusiasm in this way, and we do not go so far as adding a condemnation of his plan. It is not, however, a really good one. There is a cramped, ill-considered air about it. The cooking-class room fireplace, for instance, is put on the far side of the room from the scullery, and the larder store does not lead out of the scullery, so that the three parts, instead of being handily located together, would occasion a needless amount of running about. The circular pediment over the entrance serves to emphasise the portal; but on plan above the treatment looks meaningless. An architectural feature like this should grow naturally out of the plan to merit approval. "Nut" has given us a hard one to crack if he presumes that his building, 110ft. long, could be erected for £3,000, with cornices, shaped gables, and massive portico all in the bargain. There is a fancy for the picturesque undoubtedly about his design, of which we have already said enough perhaps, and his plan, had our funds been equal to it, might with some little alterations have been made satisfactory. Generally we think we are justified in placing "Nut" in this position in our award; but we daresay some whose designs follow would urge that, having to such an extent ignored the cost limit, he should be put down lower. Had their merits been higher, this would have been done. As it is, relative comparisons left us no choice. "Manxman" ought to have contrived his drawings on one sheet: regardless of the waste of paper, he sends four pieces. His plan is poor, and spacious in halls and landings, but confined in classroom areas. There is something about his elevation which its breadth insures; but the loss of room in the roof is manifest and very costly. "Tyke" gives a groined hall, and aims at the palatial, but fails to make either a good elevation or satisfactory plan. Let him compare the plan placed first with his own, study the two fairly, and if he does himself justice, he will improve, while "Nap" will have taught him a lesson. "St. Leonard" seems to be a very young student working under good influences; but he has much to learn—particularly in planning and in drawing; at present let him pay some regard to the relative size of things. Doors, for example, 10ft. high are needlessly big for a small building, and windows crowded up immediately under the eaves are of little value for light or architectural fitness. "Pantile" is poor, and his horseshoe lecture-theatre cuts awkwardly into his plan, which hardly calls for comment. "Ard" draws in a careless way, and would do better work if he gave more time to its study. His plans are compact, but they are not convenient. "Vlan" is not lacking in ability, which, with cultivation, will improve his position. It is not clear how one can extend a building with advantage when, in order to do so, it becomes necessary to destroy its entire sanitary arrangements, as must be done if "Vlan's" proposals were realised. "Agon" is very crude, and has no regard to economy of space in hall and stairway. "Hopton" has a better plan, and "Swan" is better still with a pretty elevation, which in perspective he has spoiled by bad drawing. He has not conformed to the rules as to the size of the sheet of drawing paper to be used. "Jupiter" comes next, and has located his cooking-class room in a rear wing, with the chemical laboratory over it; but the stairs are placed badly at the end of a very long, narrow corridor. The other designs are "Ashleigh," "The Wolf," "The Mammoth," "Ashton," "Toreador," "Aikane" (plans by Messrs. Silcock and Reay), "Don't Know" (you design exceedingly badly and write very rude letters), "Boreas," "Veritas," "Percy," "Castile," "Devonia," "K. K.," "Oblivisci Non Possum," "Rex," "Q. E. D.," "Charley's Aunt," "E. G.," "Diver," "White Friar," "Look," "Halsted," and "Too Much Trouble."

#### ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

ALTHOUGH the architectural designs exhibited this year have only a few with much interest attaching to them as public buildings of importance there are many representatives of domestic and minor buildings, where costly decorative features are not expected, but where there is ample scope for differentiating between the mere builder and the architect. Perhaps the present exhibition contains a larger proportion of excellent designs in this department than has appeared for some years, and so compensates for the lack of the grander representatives. There are only three samples of the latter class, the first and second premiated designs of the North Bridge-street improvements, which have been fully illustrated in the *BUILDING NEWS*. Objection may be made from an architectural standpoint to the northern frontage of the design selected for execution, in respect of the decorative detail of the upper part, which is probably considered by the general public, however, to be its best, as it is the most striking characteristic, next to the very excellent arrangement of this frontage as a whole. It would have been better, perhaps, if something more akin to old Edinburgh architecture and the rest of the design looked out upon the bridge than the somewhat commonplace reflection of the New Town Classic architecture from the artificial acropolis of a ten-storied tenement. Some notion of this may account for another exceptional feature—viz., the circumstance that the two floors beneath the colonnade are all but entirely destitute of windows. The second premiated design seems also to have hardly grasped the situation in giving for northern aspect two formidable feudal towers, hardly consistent with the functions of the new bridge, as the medium of amicable intercourse. The other sample of what takes rank as high art on an extensive scale in architectural design is illustrated in two large drawings by Albert H. Hodge (Soane medallion) design for an institute of architects—the front elevation (536) and a detail drawing of the central portion (488). These are, as might be expected, more excellent for the skill displayed in artistic delineation of ornamental details than for their proper architectural arrangement, and the imagination of the artist has, in some particulars, over-decorated the subject, as, for instance, where he puts a margin of elaborate carving as a border to his windows. The detail drawing is extremely interesting—from the perfection of its draughtsmanship, from the graceful pose of the statues, and the drapery, down to the minutest details of the elaborate designs of the leadwork of the windows. This drawing comprises a section of the wall, and a great many notes, giving full particulars of the costly character of the details and materials of construction and decoration in bronze and marble, &c. Messrs. Drew and Findlay, in 546, have a good perspective view of the large block of buildings now being erected in Home-street, and which agreeably takes the place of a long stretch of dead wall. The design is one of middle-class tenements, now so much required in the city, and the architects have succeeded in avoiding the bare and commonplace aspect generally characteristic of this kind of street architecture. There is no superfluous ornament, but the oriel window is managed with some originality, and a slight projection in the long frontage is happily designed. 505 is another large block of similar tenements erecting at Junction Bridge, Leith, designed by Mr. J. McEwen, in the ordinary style; and 506, also a sample of street architecture, in Kirkcaldy, on a much smaller scale, by Messrs. Swanston and Legge, does not exhibit successful treatment of its angle.

In 552 we have an etching of the board school now being built in Preston-street from designs by Mr. R. Wilson, architect to the board. The frontage shows three prominent gables, and otherwise the design seems to indicate that the school board, on the eve of dissolution, had begun to realise the need for better economy in their management. The building is in the red Dumfriesshire stone, but the dull and deadly heavy-looking mass is considerably improved by bands of light freestone in the lines of window-sills, &c.

498 is the new senior school for West Calder, by J. G. Fairley, a long range of building in one floor, in the style of construction generally adopted for such country towns, nicely relieved with gabled projections and plenty of light. 530



is another small school; by Mr. R. Wilson, very plain, but with more of the appearance of a private house than a public school. 512 is Bridgenorth and South Shropshire Infirmary, by Edward C. Henry Maidman, showing administrative block of two floors in the centre, with two wards at the extremities and intervening corridors. It is a very good sketch of picturesque arrangement in the cottage style.

493 is a water-colour sketch of public hall for Bowden, one of the many buildings now being built for the accommodation of parish councils. The colouring is not pleasant, but probably intended to indicate a building of dark Whinstone with red stone dressings; there appears to be an end gallery, as the usual large gable window is absent, and its office performed by a small triplet window overhead. 516 is also a water-colour of "Gibson Hall," Gareloch Head, by Mr. E. C. H. Maidman. 531 is another public hall, "Inglis Memorial," by Mr. T. R. Peacock. This is also a village hall, but with a little more architectural detail; a bulky and low tower is placed in the re-entering angle, but with no good effect. 539 is a very good sketch in Indian ink colours, of a picturesque design, for village school near Pitlochrie, by Alex. Hunter Crawford. Last, but not least, on the list of civic public buildings is a design for public baths, by Mr. J. J. Burnet, Assoc. of the Scottish Academy. This is a very large and artistic sketch in sepia, much more imposing from its size than for any architectural detail or variety in the arrangement. In 499 Mr. G. W. Browne (Associate), gives a good interior perspective of the vestibule of Miss Cranston's Schools, Glasgow. The principal feature of a rather confined interior is the elaborate Gothic work in wood.

There appears to be little doing in the way of church architecture, and the exhibition has rarely had so few examples; of the two exhibited only one is in the course of being built. 522 is a water-colour, lacking somewhat in its artistic delineation, of the U.P. church and hall in course of erection, Georgie-road, by D. Robertson (Associate). It is a galleried church, with aisles and clerestory, the side galleries accommodated in the aisles, which have a double row of lights, and are consequently of great altitude as contrasted with the ordinary Gothic arrangement. The front to the road shows a long range of building, with the gable of the hall at one extremity, and staircase buildings flanking the great gable of the church at the extremity opposite the hall; a tower rises, with a turret and spirelet over it, which makes rather a poor finish. 534, St. James's parish church (Messrs. Hardy and Wright) is another large galleried church of the usual type of Gothic, similar to the preceding one in many respects, but with the hall underneath the church, and with gabled aisles, of still greater altitude, instead of clerestory. The church is buried from view in the line of lofty tenements now being erected, and the tower and spire are not merely ornamental accessories.

The exhibition of this year, if in other respects not very remarkable, is so on account of the great number of country houses of all sizes, which have been only few and far between in exhibitions of later years. Of these only the more important can be noticed. 509 is a very large and beautiful perspective, in Indian ink, of additions to Knockderry Castle, Cove, by W. Leiper, R.S.A. The picture shows the tower and its connection with a portion of the house, which has apparently been built on higher ground; the chiaroscuro of the drawing is perfect. 519 is a fine water-colour, of the same high artistic beauty, representing Auchamore House, by J. Honeyman, R.S.A. This is a large mansion in the plain baronial style, and is an instance of how much can be done to evolve the picturesque without any help of costly architectural detail. In 501 and 518, Mr. H. J. Blanc, R.S.A., gives two water-colour sketches of the same highly artistic character, representing two country houses, of moderate extent, in the English cottage style, with red tiled roofing, some half-timbered gables, &c. Of the two the villa at Colmton is the more picturesque, and, indeed, will give some nice work for the carpenter in the construction of his roof. Mr. T. D. Rhind exhibits two larger mansion houses—one 547, "Glenorchy," near North Berwick, very picturesquely treated in English cottage style and another in the neighbourhood, in the bungalow or semi-bungalow style, with an immensity of roof. The latter is a water-colour of crude contrasts of white walls, red dressings, and very blue slating. In 511 Mr. J. G. Fairley exhibits a

vigorous etching of a large house for Massachusetts, in the Scotch style, not baronial in height, but with the crow-stepped gables and other ordinary detail.

The exhibition has also some good samples of designs for stained-glass windows. Mr. T. Bonnar sends three samples of internal decorative work, all in the usual elaborate, but subdued and rather dirty, colour.

There are many beautiful etchings, portraits, &c., and one large and curious work of imagination, entitled "Vanitas Vanitatum," where a child sits somewhat awkwardly playing a reed, and another figure appears to be drowning care in the goblet, with a harpy stretching its wings over the pair.

#### THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of the above society, held on Monday last, a paper was read by Mr. C. H. Hooper, of Swanley Horticultural College, on "Fruit-Growing as Auxiliary to Agriculture," which, although of more special interest to the land agent section of the members, was of very general interest in these times, when everyone is looking round for some solution of the difficulties which beset the farming industry, and the rural depression which very really affects the towns by driving into them a surplus population, generally very ill-fitted for town life or town work. There are now, Mr. Hooper said, some 219,000 acres of orchards in Great Britain, and 89,000 acres of market gardens, an increase during the last four years of 3,000 and 3,400 acres respectively. In many parts of the country fruit-growing had long been a successful industry; but lately it had been introduced in other parts, especially in the neighbourhood of large industrial centres, which were previously dependent for their supply on the London and other great markets. The author went on to describe under the various heads the necessity of paying attention to the important points of (1) suitable locality as regards facility of distribution, &c.; (2) suitable soil and aspect; (3) the provision of the necessary capital, which he showed must, in the case of extensive planting, be no small consideration; (4) the security of land tenure, without which no tenant in his senses would plant what could not bring him a crop for some years, and in this connection the author touched on the question of compensation for bearing trees standing at the end of a tenancy; (5) the different systems of orchard and field cultivation of fruit; (6) the conveyance, packing, disposal, and sale of fruit; and (7) the prospects of success to be obtained by any extensive addition to the area of agricultural land planted with fruit trees or bushes. The fruit to be grown must be determined by the climate and situation. Damp valleys must be avoided, owing to the injury to the blossom likely to result from late spring frosts. (In this connection, Mr. Wise, who, as the agent to Lord Sudeley, has under his control probably the largest fruit plantations in England, subsequently gave it as his experience that fruit trees planted at less than 200ft. above sea level suffered from frost, while those at 250ft. to 500ft. did not; in fact, he said the higher they were, if sheltered, the better.) Land worth cultivating at all was, Mr. Hooper said, generally suitable for fruit, provided it was properly drained, although some fruits had a curious habit of thriving in one field and not in the next, under apparently precisely similar conditions. A larger working capital was necessary for fruit land than agricultural land. If £10 an acre were necessary in the latter case, probably £15 to £20 would be required in the former. The Board of Agriculture sanctioned loans for fruit-tree planting at 3½ per cent., or £6 4s. per cent., to repay principal and interest in 25 years. Mr. Hooper was of opinion that, where possible, freehold land was the best for planting, but the landlord and tenant might co-operate in planting, either by the landlord paying for the trees and the tenant planting and maintaining them, or the landlord agreeing to pay for trees and planting whenever the tenant quits, or to grant a lease of such length as will enable the tenant to realise a profit on his outlay (say for 21 years). The law permitted the tenant, if he planted with the landlord's consent, to claim compensation for fruit-trees on quitting, but he could not remove them, although he might remove bushes. Much further useful and interesting information and statistics were given in the paper, the reading

of which was followed by a discussion, in which Messrs. G. Smith, Radcliffe Cooke, M.P., T. Rivers, J. Cheal, E. Luckhurst, C. T. Wise, and J. H. Sherwin took part.

It may be of interest to mention that a five days' examination, at which some 250 candidates for membership have presented themselves, has just been concluded at the institution. We shall publish the names of successful examinees in due course. The secretary informs us that the results will be known in about six weeks.

#### CONSTRUCTION OF ARCHES IN CONCRETE.—II.

THERE are two principal methods, each of which embraces, however, several subdivisions or modified arrangements, of constructing arches in concrete. The one is that in which the material is not associated with any other, possessing a different constitution and endowed with physical properties alien to it, and the other affords an example in which a combination of this description actually takes place. Again, we may distinguish these two methods by designating the first as that in which the concrete, although admittedly an artificial product, whether plain lime, hydraulic lime, or cement be employed in its composition, may be considered to be *au naturel*. The second method, sometimes known as the Melan system, may be briefly described as that in which the mass of the concrete is penetrated here and there or intermixed, either systematically or heterogeneously, with iron or steel beams, joists, angle, tee, channel, or other sections of metal, or with wiring or network of metal. This system, *per se*, by no means includes all the varieties of combinations which the imaginative ingenuity of engineers, architects, inventors, and patentees have devised. We have at home some patented systems which promise to very much outmatch the Melan system. The results of the tests, trials, and experiments conducted with the most prominent of these will be investigated, analysed, and detailed in our subsequent articles on this interesting subject.

If, as observed in our last article, so little has been accomplished by English engineers and architects in developing the progress of the building of arches in concrete, pure and unmixed with an extraneous material, how is it that absolutely little or nothing has been hitherto effected in the compound principle? The reason is not far to seek. Engineers and architects in this country view with distrust and suspicion, and consequently with a certain amount of disfavour, the combination of any two materials for the purposes of construction whose natures and molecular constitution are widely different. In the early days of railway girders and bridges the combination of cast and wrought-iron, two materials closely allied by very similar, instead of being separated by very dissimilar, properties, as in the case before us, was attended with disastrous and even fatal results. Those, therefore, who object to the intimate union of two very different materials as constituting a constructive entity, have very good, although, as we shall hereafter point out, by no means conclusive, grounds for their opinion. In connection with part of our subject, we ourselves confess we always approach with diffidence and a fair amount of caution a question similar to the one under consideration. The combined system of concrete and iron or steel, or, in fact, any metal, is one in which a certain amount of factitious strength or resistance is (or, at least, is asserted to be), imparted to one material, which it does not possess in its individual capacity, at the expense of the other. Upon this point turns the whole gist of the matter. Experiments, conducted recently both at home and abroad, undoubtedly, in very numerous instances, tend to show that the breaking resistance of such a combination is considerably in excess of what the one material, unaided by the other, is capable of affording. It does not follow, even if this result be shown to be perfectly correct, that the compound system is equally and universally available under all conditions, and that, therefore, the plain and simple concrete arch is to be obliged to take a back seat. There are numerous pros and cons to be taken into account and rigorously scrutinised before anything approaching an accurate or definite result can be fairly arrived at.

As already stated, there are several excellent examples of the construction of arches in concrete on both the simple and compound principle; but their number is comparatively but few, and their



lives are at present too short to enable any valid judgment to be formed as to their durability and permanent stability. A very significant conclusion has been very recently arrived at with respect to the rival merits of the simple and compound systems which it is right we should place before our readers. In selecting the design for the new Coulouvrenière bridge, over the Rhône at Geneva, the Monier system was rejected, and the preference given to the simple concrete system by the committee of engineers, architects, and experts appointed by the Swiss Government to decide upon the whole question. The two main arches of this structure have the very respectable spans of 136ft. each. It is unnecessary at present to adduce the reasons given by the committee for arriving at the determination they did. When *à propos* to our immediate subject, they will be stated and inquired into. We shall now pass on to a description and examination of some of the experiments conducted with the object of elucidating the advantages possessed by the construction of arches in concrete.

One of the principal difficulties in carrying out tests and experiments with arches, compared with their horizontal *confrères* is, that while the latter only exert a vertical pressure upon their points of support, the former develop a thrust tending to overthrow their abutments at the toe. Moreover, an amount of settlement in the supports, which would practically be of no importance in the case of a horizontal girder, would be fatal to the arch principle, especially if the structure were built of stone, brick, or concrete. It may be here stated, before passing on to the actual experimental stage, that the combination of iron and, in some instances, of other metals—lead and zinc, for instance—with brickwork and stonework, has been not only known, but recognised, and practically carried out from comparatively early times. It is very probable that the idea of employing iron or steel to strengthen or fortify arches built of the recently new material, concrete, was nothing else but a simple extension of the hoop-iron bond principle still used to give additional security to structures of brickwork. Iron bolts, cramps, dowels, and other metallic accessories have been always employed to bind together the large stones—completely gigantic monoliths—which constitute the foundations of lighthouses and other edifices hourly exposed to the fury and violence of elemental agency. Ordinary hoop-iron, ranging from 1in. to 1½in. in width, with a thickness from ¼in. to ½in., corresponding to from 16-18 B.W.G., is built into brickwork for the purpose of increasing its strength. Whether it really increases the permanent or ultimate strength of the wall, or of whatever other form the combination may consist, is fairly open to a good deal of doubt; but, on the other hand, there is not the slightest doubt whatever that it increases the strength indirectly of brickwork by very much augmenting the general stability of the particular design to which it is applied. At the same time this union of the two different materials has its disadvantages. The hoop-iron must be carefully protected from damp and moisture, which is usually effected by giving it a good strong coating of tar. In order to enable it to catch a firm grip of the mortar or cement in which the brickwork is laid, it is well sanded, and sometimes the edges of it are roughed or jagged. Should damp obtain access to the hoop-iron it at once rusts, or, in chemical phraseology, oxidation supervenes, which develops an expansive action of irresistible force, and in this manner the joints of the brickwork are loosened, shaken, and dilated or opened to a very considerable and very dangerous degree. There is, as an instance in point, the well-known case of the lofty prison wall, in which the joints in the brickwork were opened to the extent of ¾in. by the oxidation of the hoop-iron and its accompanying expansion. As a matter of fact a large, in reality the greater, portion of the wall was subsequently blown bodily down in a gale of great violence. That this catastrophe was unquestionably due to the cause assigned was abundantly proved by the circumstance that in the smaller lengths of the wall which lived through the storm, which were, however, pulled down with the overturned parts, the hoop-iron was found perfectly well preserved without any signs of rust on it. In arches of fairly large spans, hoop-iron bond has been sometimes inserted between the rings in a direction parallel to the line of intrados. Hoop-iron was the modern successor to the old bond timbers which, with their certain liability to shrinkage, rot, and the chances of fire, have been properly

abandoned. Admitting, therefore, that the combination of iron or steel and brickwork does tend to increase the stability of the whole, there is not the slightest reason why the same beneficial results should not attend a similar union of the metals with concrete. It might, perhaps, be argued that similar advantages would accrue *a fortiori* to the latter system, inasmuch as the union between the two materials is closer and more intimate than in the older combination. Whether this increase of strength does distinguish the compound principle, and if so, to what extent, is one of the objects of our present articles.

The testing of arches is a more expensive and troublesome affair than that of horizontal girders, as it is indispensable that the points of support should be practically immovable. It would be a very costly proceeding to build full-length abutments for every example to be experimented upon, although in instances in which the end justified the means, such expense has been frequently incurred. The manner in which the

FIG. 4.

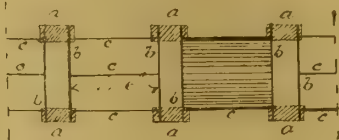


FIG. 5.

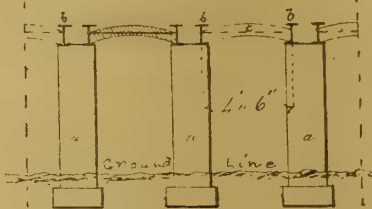


FIG. 6.

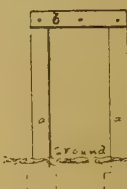


FIG. 7.



dictates of economy have been adhered to, and satisfactory results arrived at, will now be investigated.

The general plan adopted in the valuable list of experiments undertaken in Vienna with arches having spans respectively of 4ft. 6in., 9ft., and 13ft. 3in., is represented in Fig. 1, in which *aa* are the piers built to carry the rolled joists *bb*, which form the skewbacks or springings upon which the arches abut. By this arrangement the necessity for building the abutments or whole piers the length of the arches themselves is completely obviated. Tie-rods, *cc*, connect together the rolled joist springing of the same arch. It should be observed that the joists *bb*, unless they belong to the same arch, are unconnected and entirely independent of one another; thus no two consecutive arches rest upon the same rolled beam, and thus in subsequently carrying out the tests no one arch derived any extraneous support from either of its neighbours. All the small piers were built up to a height of about 3ft. 6in. above the ground, which allowed of the necessary observations being made with all the accuracy and facility desirable. Since the thrust of each arch had to be resisted by its own pair of rolled beams, it was, in the first place, necessary to proportion their dimensions and sectional areas in accordance with the stresses to which they would be subjected. They were thus required to be able to have a breaking stress due to a variable load of from 225lb. to 1,120lb. per square foot of the horizontal surface of the arch. This method of calculation is not quite accurate for a load uniformly distributed over the arch; but it is quite sufficiently approximately so for all practical

purposes, especially in the small spans and loads at present under consideration; in reality, a dead load upon an arch is not distributed uniformly upon the horizontal hypothesis, but increases slightly from the crown towards the springings. The rolled beams supporting the arches having a span of 4ft. 6in. were 11½in. deep and 1ft. 3in. in depth for arches of twice the amount of that span; for the shorter spans the tie-rods were 1½in. in diameter and 1½in. for the longer spans. There were in all seven specimens of arches tested of a span of 4ft. 6in., of which two were built of ordinary bricks, with longitudinal and with circular or annular joints. Four were constructed of an especial description of brick, to be hereafter referred to, and the seventh was constructed of ordinary concrete. An elevation of the design, shown in the plan in Fig. 4 is given in Fig. 5, an end elevation in Fig. 6, and a longitudinal section through the crown of the arch in Fig. 7. It should be stated that the tie-rods connecting each pair of rolled beams proved much too weak to stand the horizontal thrust of the arches, and they were replaced by strong channel-irons and gusset-pieces riveted to the ends of the joists, into the details of which we cannot afford space to enter. The load was made up of a number of pigs of iron, and arranged as follows: Over the naked arch was spread several layers of clean, dry earth, levelled up; upon them a platform of strong planking was laid, and the pigs piled up as required. These preliminary small arches were all constructed four or five months before they were submitted to the testing operations, and this interval was more than sufficient to enable them to "set" thoroughly before they were broken. The results of these experiments will be described in our next article.

#### WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XIII.

**Z**EDS, or zed-angles, Fig. 43, A, are valuable in constructional work for connecting flat bars or plates without the cost involved in riveting

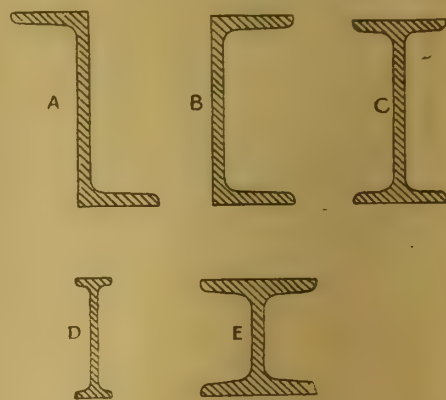


FIG. 43.

two angles to a central web or to each other; there is an absence of symmetry in the construction, but it is economical. Even when the width of web is too great to permit of the use of a zed, or of two angles, the unsymmetrical form is frequently adopted in riveting up the equal angles; dimensions obtainable range from 2in. or 3in. to 8in. or 10in. in the web and 1½in. to 3½in. in the flanges.

Channels, or channel bars, Fig. 43, B, are also valuable, because they save the cost of riveting up plate and angles. In various ways they enter into combination with other sections; they serve as stiffeners, and are suitable for resisting either tension or compression. Their dimensions range from 1½in. to 15½in. in the web, by from 1½in. to 3½in. in the flanges; but 12in. width of web is only exceeded by two or three firms.

The rolled joist, Fig. 43, C D E, is used alone, or in combination with plates. Since the advent of steel these joists can be rolled of such large dimensions that they have largely supplanted the more expensive built-up girders; such joists can be had up to 20in. deep, with a weight of 89lb. per foot. They can be obtained as small as 4in. in depth, with a weight of only 5lb. per foot. Between these extremes all kinds of relations between flange, web, and thickness are obtainable, as shallow webs and broad flanges, or the reverse, thin in section or thick. In the smaller joists



wide flanges can be got equal in width to the depth of the joist, as 5in. by 5in., 3in. by 3in., &c., but invariably the flanges are heavy, heavier than the webs, making the running weight high: so that, when exceptionally wide flanges are necessary, they can only be obtained by riveting flats to the joist flanges. Then the joist can be

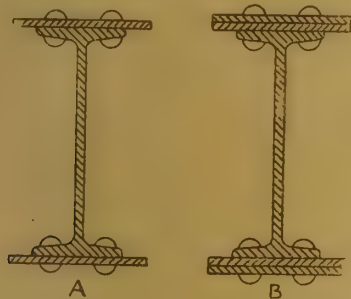


Fig. 44.

proportioned for almost any width of flange, making it in effect a webbed girder with broad flanges. The joist is then only the base for the girder, and the flanges can be composed of one, two, or more thicknesses of flat or plate, Fig. 44, A B.

The taper of the flanges of joists is usually rolled to an angle of 90° with the web; the weights of joists and sections are always reckoned



Fig. 45.

also much per foot run, only the weight of rails is reckoned at per yard. Firms do not undertake to supply sections without an allowance of 2½ per cent. variation either over or under the specified weights.

There are advantages and disadvantages in the use of rolled joists; the webs are thicker in proportion to depth than the webs of built-up girders, and that adds to dead weight, but the need for

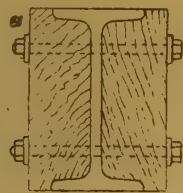


Fig. 46.

vertical stiffness is diminished. The flanges are narrow, often rendering necessary the riveting on of top and bottom plates, as in Fig. 44; but the use of separate angle-sections, with rows of rivet-holes for union to the web, as in built-up girders, is avoided, and girders can therefore be built cheaply of joists in single or double-webbed forms, Figs. 44 and 45, two elementary examples



Fig. 47.

only, of which many useful and extended combinations are adopted.

Rolled joists are the basis for the flitch beam, Fig. 46, the timbers being bolted on each side of the joist; the iron is thus disguised, lightness of appearance is gained, and the timber affords a more serviceable basis of attachment for car-

entry than the iron. Flats alone are often used as the stiffening element in flitch beams.

Splayed channels are special sections made in two or three dimensions only; sometimes one flange only is splayed, or set outwards to an angle greater than a right angle, but often two flanges

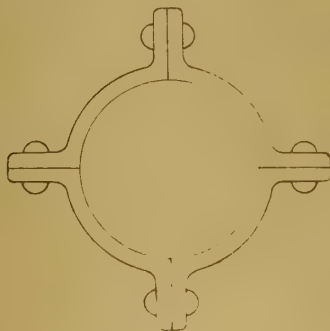


Fig. 48.

are also splayed. This double splayed channel section is used for building up columns. Standard sizes are given by manufacturers, but, in case of a large number being required, sizes other than list-sizes are obtainable. The section in Fig. 47 is, however, much more generally used, being the basis of the well-known Phoenix column.

Rounds and squares are made in many sizes; squares are less used in structures than flat bars,

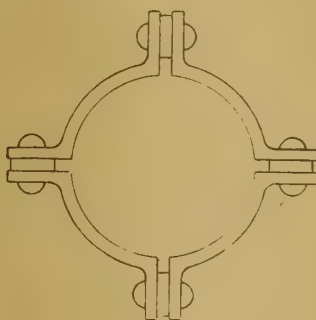


Fig. 49.

but rounds are employed largely for tension-rods. Squares range from ½ in. to 1½ in., advancing by ¼ in.; from 1½ in. to 4 in. or 5 in., advancing by ½ in. or ¾ in.; from 5 in. to 6 in. or 7 in. by ¼ in., ½ in., or ¾ in., varying with different houses. Iron squares are obtainable up to 6 in., steel up to 7 in. Rounds go from ½ in. to 8½ in., the lower sizes advancing by ¼ in., from about 1½ in. to 4 in. by ½ in., and over 4 in. by ¾ in. generally. Steel rounds and squares are extras above 3 in. in some cases, above 4 in. in others; they are limited to



Fig. 50.

25ft. maximum in iron and in steel. Iron bars of 5in. diameter cost 30s. extra, of 6in. 60s. extra; in steel 5s. extra from 3in. to 4in.; above that, prices by arrangement. Bars to pass the Board of Trade and the Admiralty cost 20s. per ton extra.

Lengths are cut in two or three ways at steel-works; joists are cut while hot, but are not guaranteed within an inch either above or below. To cut to ½ in. extra is charged, and extra also for facing-off ends square; joists in stock are cut to length to order, but the cost of cutting and waste is charged for.

These are the principal sections used in constructional work; the cruciform section, though

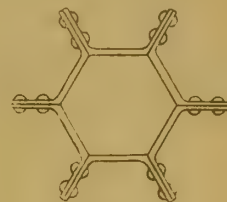


Fig. 51.

obtainable, occurs in such small dimensions as to be of little value. Other special sections have a certain value in special cases, but are not generally used. The double-headed rail section is one which finds many applications in structures, as we shall observe in due course. We now have to take these elementary sections and observe how they are combined in structures; first in the elementary forms of columns, girders, &c., and then how these are united to one another.

Commencing with columns and stanchions. The Phoenix column, Fig. 48, is used to a greater extent in America than it is with us. One of the drawbacks to its use is the difficulty of making attachments to it; it has been the parent of other combinations, having flat faces to which work can

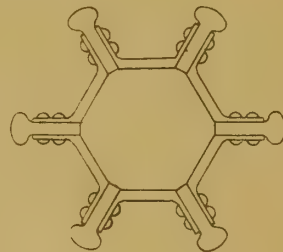


Fig. 52.

be riveted. Usually four segments are used on a column, but when over about 8 in. in inside diameter six and eight segments are employed. Since the objection to this column is that it does not afford the best facilities for the attachment of tees, girders, and other details, the modified forms, Figs. 49 and 50, have been used; tees and bracings are fitted within the flanges in Fig. 49, which are kept apart by means of distance or thickness pieces; in Fig. 50 they are attached to the web-plates which fit between the flanges and extend beyond them. The web-plates also add to the stiffness of the column by reason of their width. Figs. 51-53 illustrate useful types of columns built of hexagonal section; the primary element

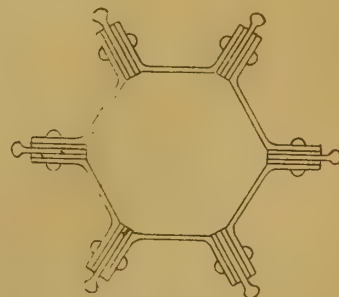


Fig. 53.

is the splayed channel, and Fig. 51 shows six of these channels riveted together. These channels are the basis of Lindsay's bridge flooring or decking. Fig. 51 is a combination of these sections with specially thick bulb bars, and Fig. 52 the same, with thinner bulbs, but with flanking flat bars to make up the thickness necessary for rigidity. The illustrations require no explanation.

J. H.



## BOOKS RECEIVED.

*Laxton's Builders' Price Book* for 1897, eightieth edition (London: Kelly and Co., Ltd., High Holborn and Great Queen-street).—This edition of the well-known price book fully maintains its position. The prices and memoranda of the various trades have been brought fully up to date, and several sections of value to the architect and contractor have been added or enlarged. The remarks on electric lighting, the rules for installation, issued by the Sun Insurance office, and those of the L.C.C., for the protection from fire of public buildings; the new Form of Agreement, and Schedule of Conditions for Building Contracts, issued by the R.I.B.A.; rules of procedure in cases for the Tribunal of Appeal, under the London Building Act; the by-laws of the L.C.C., under the Metropolis Management and Building Acts Amendment Act, 1878, are of value; the London General Powers Act, 1890, Public Health (London) Act, 1891, &c., will be found in this work. A variety of other rules, as those of the Building Trades, Regulations under Metropolis Water Act, 1871; the regulations of the L.C.C., applying to theatres, &c., are given *in extenso*. The notes of cases brought before the superior Court, under the Metropolis Management Act, 1855, later Acts, and the decisions under the New Building Act, will be valued by all practitioners. These and other general tables and memoranda, including a full index, render this volume a necessary addition to every architect's and builder's office library.—*Journal of the Sanitary Institute*, January (London: Edward Stanford, Charing Cross), contains papers and discussions at the Congress, Newcastle-on-Tyne, on the subjects of sanitary science, engineering and architecture, and chemistry, meteorology, &c. "The Treatment of Sewage by Chemicals in Solution," by Herbert Henry Law, A.M.I.C.E., illustrates an apparatus for automatically regulating the quantity of chemical applied to sewage. "Sewage Irrigation in Europe and America," by H. Alfred Roehling; "Notes upon the Planning of Secondary Schools," by J. Osborne Smith, F.R.I.B.A., are interesting. A paper on the "Sanitary Construction and Fittings of Stables, Cow-Houses, and Piggeries," by Louis Hanks, and one on "Sanitary Fittings and Connections," by W. E. Bland, Lecturer on Sanitary Science, Durham College of Science, Newcastle, are of value. The latter paper is illustrated by sections and diagrams of gully traps, disconnecting traps, valve closets, and other types, and various kinds of joints to pipes.—We have also received a *Monograph on the Cathedral Church of Wells*, by ALFRED C. CLARKE (Wells: Arthur G. Young; and London: W. H. Smith and Sons), illustrated with reproductions of detailed drawings by the author. Mr. Clarke acknowledges his indebtedness in this thin octavo to the late Edmund Sharpe and J. D. Sedding and other writers; but does not seem to have come across the exhaustive and picturesquely written work on the same building penned by the late Edward Augustus Freeman. The author awards the palm among English cathedrals to Wells on many grounds, and deals in detail with the architecture, history, and features of the building. The little book, which is published at 18d., small paper, and 3s. 6d. in large-paper copies, would be rendered far more useful if a figured plan were incorporated. Another defect is that it contains no views of the incomparable west front or general interiors.—The 1897 edition of the *Local Government Annual*, which gives the names and addresses of the chief officials of all corporations, county councils, boards of guardians, urban and rural district councils, county and borough asylums, &c., throughout the kingdom, vestries, district boards, public libraries, public parks, city companies, ward clerks, &c., together with a diary—is far ahead of its predecessors, the contents being rearranged and printed in new and better type. The most valuable of the new features, of which there are many, is an abstract of the Local Government Legislation of 1896. Ten new Acts are summarised in crisp and intelligible style, and where cases occur of sections of Acts being repealed the substance of the portions referred to is also given. To everyone connected with local government, and especially to public officials, this feature must prove very valuable. Other improvements include the setting out of the list of rural councils in alphabetical order, and the substitution of the surveyor's name for that of the medical officer. Complete information is also added respecting the Thames and Lee Conservancies, county boroughs, and authorities for

special sanitary purposes. Every year the book grows in bulk and usefulness, and the price—half-a-crown—is a very moderate one for a work practically indispensable to public officials and contractors. The book is published at the offices of the *Local Government Journal*, Dorset-street, Fleet-street, E.C.—*Manual of Wood-Carving*, by WILLIAM BEMROSE, with an introduction by LLEWELLYN JEWITT, F.S.A. Twentieth edition (London: Bemrose and Sons, Ltd., Old Bailey).—This handsomely printed and bound little treatise will be found serviceable to beginners in the art of wood-carving, and it has a selection of designs. The introductory remarks by Mr. Llewellyn Jewitt, and the chapter on English Domestic Woodwork, by Mr. W. Bemrose, will be found interesting. The latter gives an historical résumé of the styles—the Perpendicular, Tudor, Jacobean, and Georgian. The date assigned to the Perpendicular is 1399, the Tudor 1539, the Jacobean 1603 (including the Italian Renaissance), the Georgian about 1717; but these dates are misleading, as each style developed gradually out of the previous one, as the Perpendicular did out of the Decorated. It would have been better to give a typical example of each period, and the date of the same. The amateur will find the chapters on the tools and other requisites for carving and diaper carving useful. These are illustrated by plates showing the tools used. As to the examples given, the earlier designs are rather feeble. The designs for drawers, tablets, and pilasters, are redundant, and hardly suitable for amateurs. The leaf mouldings or diaper carvings are too florid, and we certainly take exception to the design for fern shade, Plate XI., the fretwork frames and chiffonier in Plate XII. The church furniture also is of a kind we have got beyond. The supplementary plates of old wood-carving are much better, and the student might follow these with advantage. In a future edition we should recommend a few more examples of old work in which simpler motives prevail. As a technical manual we can recommend the work.—*Spon's Architect's and Builder's Price-Book*, 1897, by W. YOUNG, architect, Twenty-fourth edition (London: E. and F. N. Spon) is a revised and enlarged edition of a well-known price-book, combining in its alphabetical arrangement the advantages of a handbook in which not only memoranda of each trade are introduced, but useful summaries and formulæ, as, for example, ancient lights, approximate cost of buildings, tables and memoranda on building stones, strength of materials, details of the Five Orders, and a variety of other matter of daily use to architects and builders. The chapters on electric lighting, with specifications and estimates, and other subjects, make this edition a very useful office companion.—*Handbook of Gothic Architecture*, for photographers and others, by THOMAS PERKINS, M.A. (London: Hazell, Watson, and Viney, Ltd., Creed-lane, Ludgate-hill), is a reprint of a series of articles that appeared in the *Amateur Photographer*. They were written to give photographers information about old buildings, so that they may use their cameras intelligently in architectural work, and this object the author has accomplished. But Mr. Perkins's little volume, which is illustrated by photographic views and details of many of our cathedrals and churches, and domestic work, and several sketches of details (not very well drawn, by the way) will be found a useful introduction to our national architecture for the general reader, as well as for the photographic student.—*Thermodynamics (Supplementary Volume)*, treated with elementary mathematics, by J. PARKER, M.A. (London: Sampson Low, Marston, and Company, Ltd.), is a continuation and completion of the author's work on this subject, though it will be found intelligible without reading the previous volume. The student of physical science will find the subject of kinetic energy thoroughly investigated. The three forms of work, heat, and electric energy, are discussed, and the notes on "Work," and the "Dynamical Principle of Kinetic Energy," and "Carnot's Principle" are of value. Applications to animal and vegetable life, tidal friction, and electricity are made.—*The Gentleman's Magazine Library, Part IX: Nottinghamshire, Oxfordshire, and Rutlandshire* (London: Elliot Stock, 62, Paternoster-row). For some years past Mr. G. Laurence Gomme, F.S.A., has been engaged in compiling a classified collection of the chief contents of the *Gentleman's Magazine* from 1731 to 1868. The first portion, dealing with English

topography, arranged alphabetically and under counties, has now reached the ninth volume, comprising the references to Notts, Oxon, and Rutland, and has been edited by Mr. F. A. Milne, M.A. The notes on church dedications and arms are not, Mr. Milne remarks in his introduction, so numerous for Nottingham as in the case of other counties, an exception being a particularly full description of Wharton; domestic architecture is, however, described in several cases, and there is a lengthy notice of Nottingham Castle. Oxfordshire, a still more interesting county, yields further descriptions of family history and architectural details. Dorchester and Adderley churches, with their clergy, are very fully dealt with, but other churches are also well described, and oftentimes prior to the restorations of modern years. The building account of Thame Church, temp. 1412, is transcribed from the original records in full. Scaffolders, masons, glaziers, labourers, and others engaged on the job were paid from 6d. to 7d. a day, but the men "for to sawwe stone" only got 3d. Tiles were half-a-crown a thousand, laths 6d. a hundred, roofnails 5d. to 6d. a hundred, lead 1d. a pound, and solder 3d., while locks and keys cost 4d. apiece. The great window was a costly affair. "John Beckely, of Hedyndon," was paid 15s. 6d. for stone; John Mason, for having a setting of the same, received no less than £4 2s. 6d., and the carriage of seven loads of the stone from Hedyndon (Headington) is set down at 8s. 5d., and the other four loads 5s. 6d. Another big item was the rood loft, which cost for cleaning and varnishing alone 3s., while before it were certain balls of latten, which were from time to time "skowrd" at a further outlay. The organ loft, added forty years later—in 1477-80—was built by Thomas Carpenter and Peter Marmyon, and cost 24s. 2½d., and the organ itself, including 26s. 9d. paid to Edward Johnson for advice, £4 11s. 8½d. A small organ was afterwards added at a cost of 18s. 3½d., and in 1523 both instruments were sold to the parson of Staunton (St. John?) for 50s. As might be expected, a large proportion of the book (forty-eight pages) is devoted to the churches, colleges, and monuments of Oxford. Under Rutland, a number of family and heraldic notes of much interest are given, and the mansion of the Winchelsea family at Burley-on-the-Hill is fully described. It is to be regretted that the original illustrations have not been reproduced in these reprints. An excellent and noteworthy feature of these volumes is the copious and full indices, both of names and places. We have frequently had occasion to test them in the earlier volumes published, and thus far have always found them accurate.—*American Society of Civil Engineers*.—The journal for February, contains some interesting notes on Portland cement concrete, by Andrew Lundteigen, with tables of tests. The author alludes to the method for improvement of concrete by adding certain quantity of fine silicious materials.—*The Engineering Magazine*, March (London: George Tucker, Salisbury-court), contains a readable and well-illustrated article on "The Positive Value of Quiet and Beautiful Streets," by Mr. J. W. Howard. The author speaks of the advantage of narrowing paved roadways in residence streets away from the centres of cities, especially when smooth pavements are used; because such a surface facilitates rapid traffic, as the vehicles pass in less time, and less width of roadway is needed. The expense is thereby saved, and space is obtained for grass plots between the sidewalk and arch of the street. North-street, Buffalo, is of this description—a smooth, clean, quiet pavement, with grass plots and good walks, making a more agreeable setting for houses. We may learn much in this direction; our suburban highways ought to be so arranged. Another sensible remark is, "No single pavement is suited to all cities or to all streets of one city. Asphalte, granite, brick, wood, macadam, and other materials have their proper places. The problem is to decide upon the material and methods for each street." This view we have often insisted on. There is a general opinion amongst local authorities and engineers that if one material answers well in a city like Liverpool it is applicable to other cities as well, and that if one pavement is found to wear well it ought to be used in every street. Other interesting articles appear. "The Materials and Methods in Fireproof Construction," by W. M. Scanlon, is worth reading. The second article, by G. P. Kreuzpointner, on "Standardising the Testing of Iron and Steel," appears, a subject we have already mentioned.



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ILLUSTRATIONS.

THE LEAMINGTON BREWERY.—DESIGNS FOR A TECHNICAL INSTITUTE.—MELROSE ABBEY.—THE CHAPEL, MERCERS' HALL.

Our Illustrations.

THE LEAMINGTON BREWERY.

THE illustrations given show the additions made to the above brewery for Messrs. Lucas and Co., as carried out by Messrs. Scamell and Colyer, architects, 18, Great George-street, Westminster, S.W. The additions, as well as extension of the brewery plant, are made at the central portion, which consists of a building in red brick with stone dressings, the panels being filled in with Brown's diaper bricks. The roofs are framed in iron and covered with double

and vapour arising from the boiling department, &c.; the grist is raised in an iron elevator to a grist case, also of iron, where it is stored ready for the next day's brew. The mash-tuns are cast-iron, fitted with gunmetal false bottoms and copper covers, and are placed directly below, the mashing being accomplished by a Steel's machine; the coppers are steam-heated, and are provided with covers and ventilating pipes; the house is thus kept from steam and vapour. The hop-backs are placed in the above house, as well as the pumps which raise the wort to the coolers at the top of the building (left-hand side of the picture); the wort then passes over Lawrence's patent refrigerators to the tun-rooms. The present tun-rooms are placed at the right-hand side of the picture, but further extensions in this department are in contemplation; the maltings are on the left-hand side. Extensive cellars for beer are in basement; the capacity of the plant is 60 quarters. The contractors for the work were Messrs. G. F. Smith and Sons, Leamington. The granolithic paving was supplied by Messrs. Stuarts, Limited, Regent Dock, Limehouse, E.

"BUILDING NEWS" DESIGNING CLUB: A SMALL TECHNICAL SCHOOL.  
(For descriptive article and awards see p. 446.)

MELROSE ABBEY: ROYAL INSTITUTE OF BRITISH ARCHITECTS' SILVER MEDAL DRAWINGS.

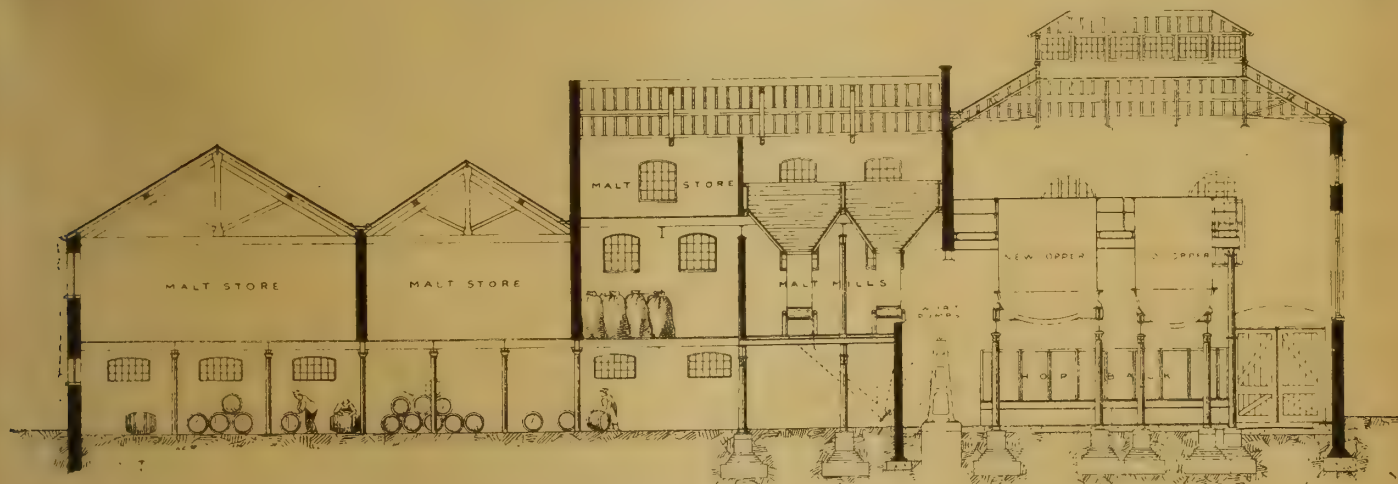
THIS sheet of details of Melrose Abbey is the one chosen by the Council from the Silver Medal Drawings to circulate among the affiliated societies in various centres about England with the other prize works now on exhibition in this way from the Royal Institute of British Architects. On Feb. 5 last we published the plans and general drawings of Melrose Abbey from the same set by Mr. Fred. J. Wass, and we then gave some particulars of this famous building, and to these we refer our readers.

CITY GUILDS, NO. XXXII.: THE MERCERS' HALL—THE CHAPEL.

FROM the Mercers' Hall we have already given three double-page illustrations. The staircase

Engineering Notes.

NEWCASTLE-ON-TYNE.—The Redheugh Bridge, which for more than a quarter of a century has connected the western districts of Newcastle and Gateshead, is about to be replaced by a new steel girder bridge, designed by Messrs. Sandeman and Moncrieff, M.M.Inst.C.E., of 2, St. Nicholas' Buildings, Newcastle, with most satisfactory results, and the contract for raising the structure has been given to Sir William Arrol and Co., Glasgow. The outline of the new bridge is of an American type, but the details are in accordance with English practice. The new bridge will occupy precisely the same position as the existing bridge. Portions of the existing approaches will be left; but these are the only parts of the present structure that will remain when the new bridge has been completed. There will be no difference between the dimensions of the old bridge and those of the new one. There are two large spans in the middle, with a shorter span joining the shore on either side. The larger spans are 252ft. from one pier centre to the other, and the shorter spans are 170ft. from the pier centre to the shore, making the total length of the bridge, with the approaches, 1,190ft. The width of the carriage-way is 20ft. clear, and there is to be on either side of it a footpath 7ft. wide, the total width of the bridge being 53ft. The bridge is to be built of steel throughout, and its total weight will be about 2,900 tons. Two new steel 24in. water mains and two 27in. gas mains will be carried outside of the hand-rails, and turned under the bridge at either end. The new bridge will be carried upon cylinder foundations, each 8ft. in diameter, and sunk to a depth of 50ft. below low water, and, as far as possible, the work will be carried on without erecting staging in the river. The sinking of the foundation cylinders will be done on the pneumatic principle. Although the new bridge is to occupy the same position as before, the existing bridge will not be demolished until the new one has been completed, and foot-passenger traffic will be continued during the operations. The new piers will be built around



LONGITUDINAL SECTION E-F

SIXTY-QUARTER BREWERY, FOR MESSRS. LUCAS AND CO., LEAMINGTON.

boarding, felt, and Welsh slates; at the top of roof is a glazed lantern, fitted with swing sashes, worked by simultaneous opening gear. The copper-house roof is also provided with a similar lantern ventilator, worked in the same manner. The ground-floor is laid with Stuart and Co.'s granolithic paving. The copper-house is separated from the mashing and tun-room departments. The mill-room is also separated; this latter is done to save risk of fire spreading, should an outbreak occur in any adjoining part. The window-sashes are of the glazed louvre type, being operated by special opening gear. Careful provision is made for ample ventilation, and the drainage is carried out in accordance with modern ideas. The plant is arranged as follows:—Cold and hot liquor backs are fixed at the top of the building, at a level to command all parts of the brewery. The malt and hops are raised by steam-power, and are stored in floors shut off from the mashing and boiling departments; the malt is ground in a separate room, cut off from steam

was illustrated in our issues for Nov. 8, 1895, and Aug. 14, 1896. On May 29 last we published a view of the State drawing-rooms. To-day we give a plate, taken for us by Mr. J. T. Sandell, representing the chapel, an interesting example of Late Renaissance work, very like some of the City churches in the detail of its wainscot fittings.

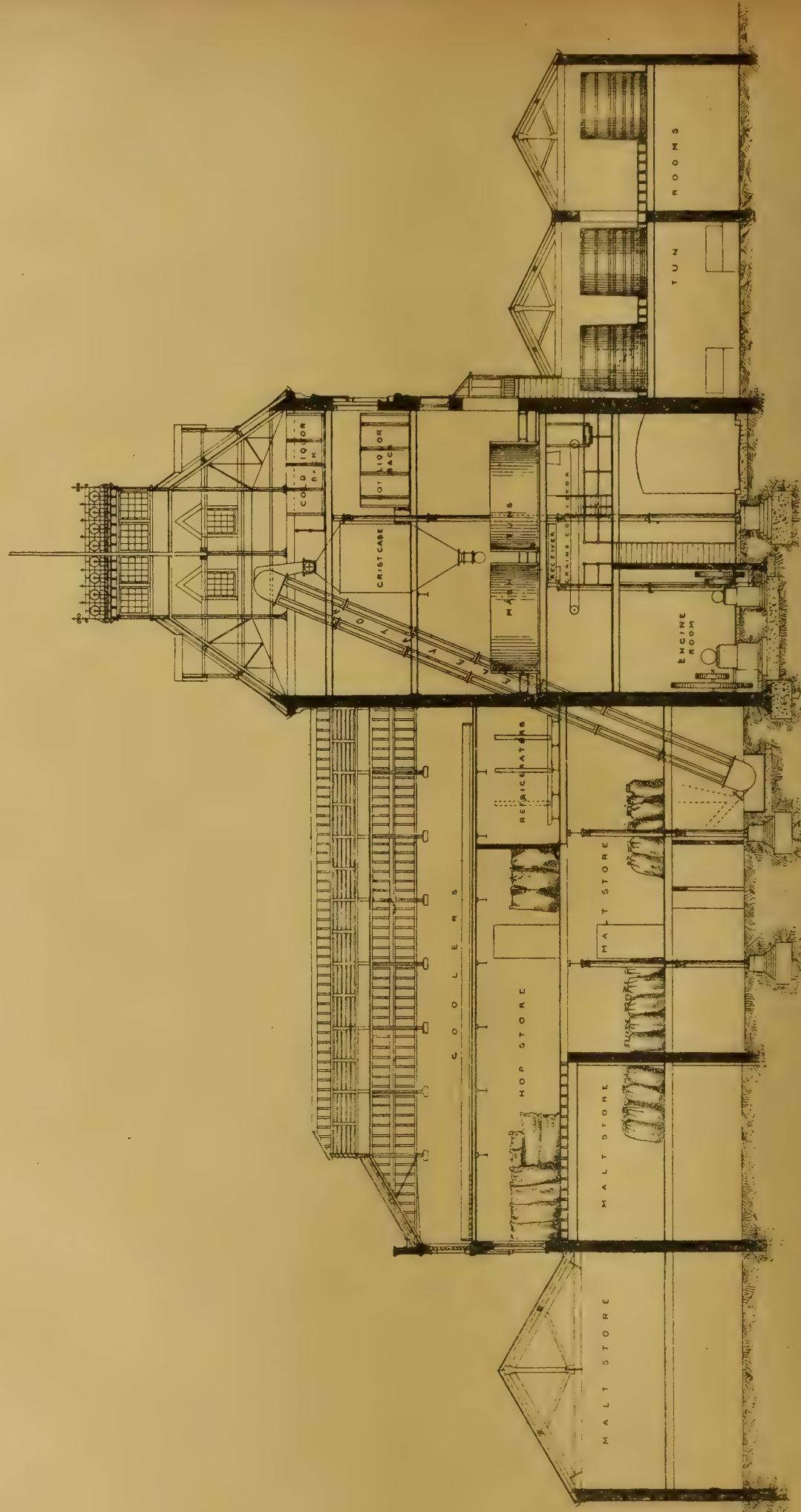
The new offices for the Cheshire Lines Committee at the Central Station, Manchester, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At Birmingham, on Friday, Colonel J. Ord Hasted, R.E., one of the Local Government Board Inspectors, held a series of inquiries into proposals by the city council to borrow money for various improvements, including £25,586 for completing the new market and slaughter-house, and £15,000 for the widening of Digbeth.

and will thus inclose the existing piers. Then upon these piers the first portions of the bridge itself—the girders and the floor—will be erected, but they will be placed 4½ft. to the side of the position they are intended ultimately to occupy. When this has been done, a temporary footway, boarded in, will be provided, the old bridge will be torn up, and the new structure will be moved bodily over, by the use of hydraulic apparatus, to its final position. Each of the spans will be moved over independently; finally, the structure will be fastened up, and made absolutely rigid. The preliminary preparations for the building of the new bridge have already been commenced. The lines are being marked out, and, at Glasgow, the contractors are busy with the preparation of the material. The actual work of construction will begin in a few weeks.

The Theatre Royal in Smithford-street, Coventry, is about to be rebuilt, from plans by Mr. Sprague.





LONGITUDINAL SECTION A-B.

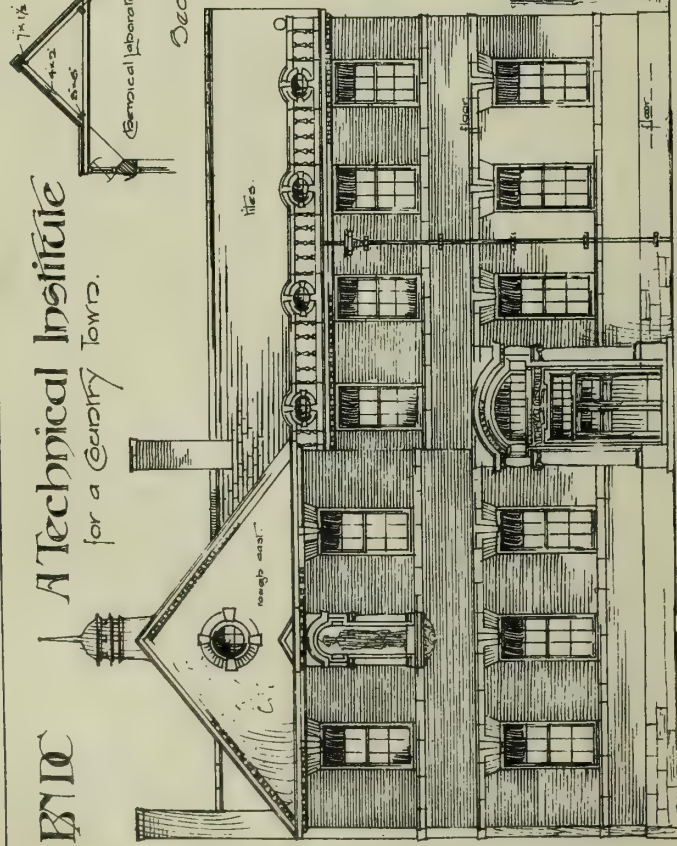




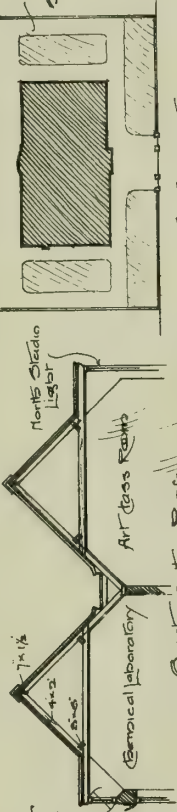


B.T.C.

# A Technical Institute for a Century Town.

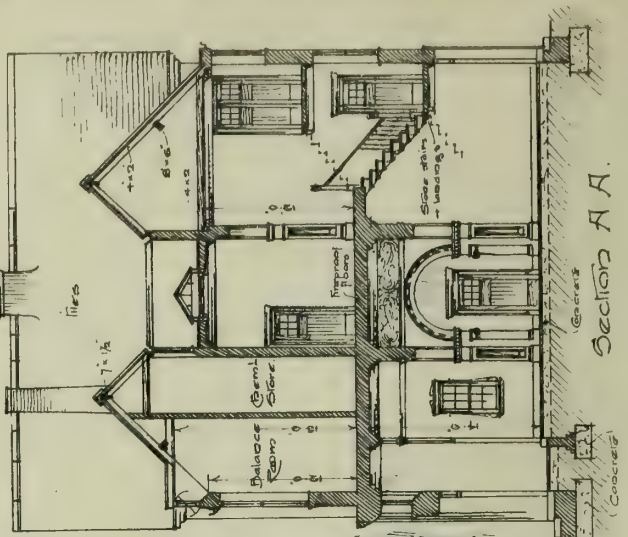


South Elevation

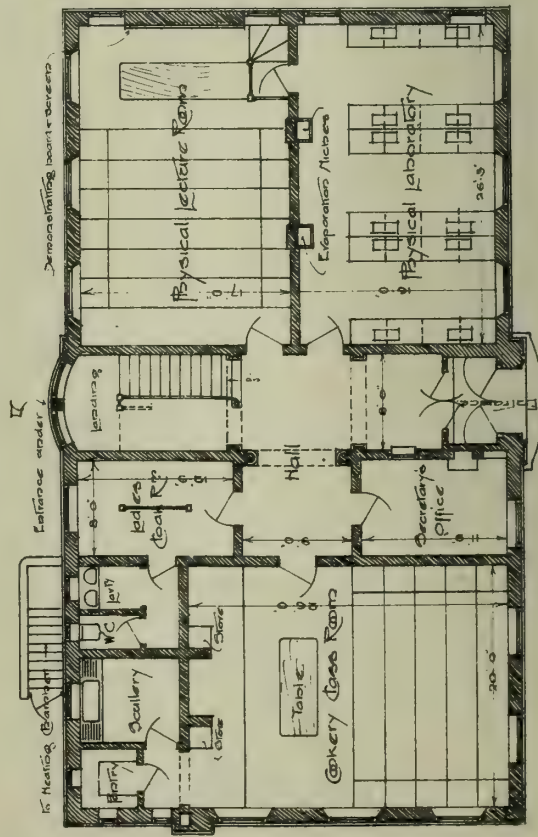


Block Plan  
Scale 70 feet to an inch

Map

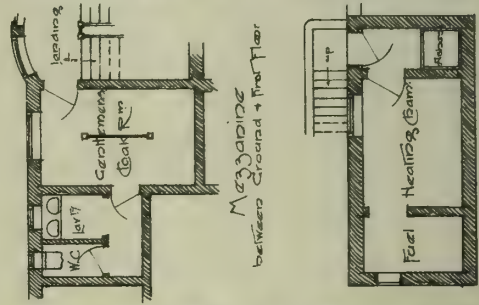


Section A.A.

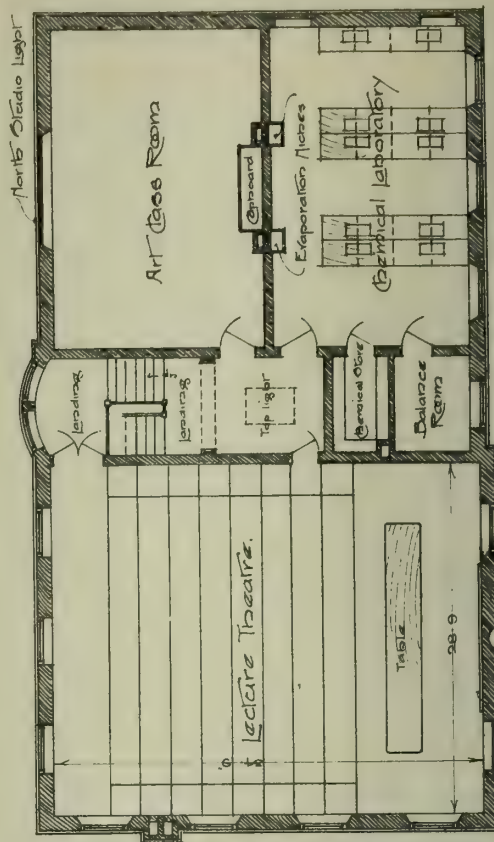


Ground Floor

PLACED FIRST



Basement Floor

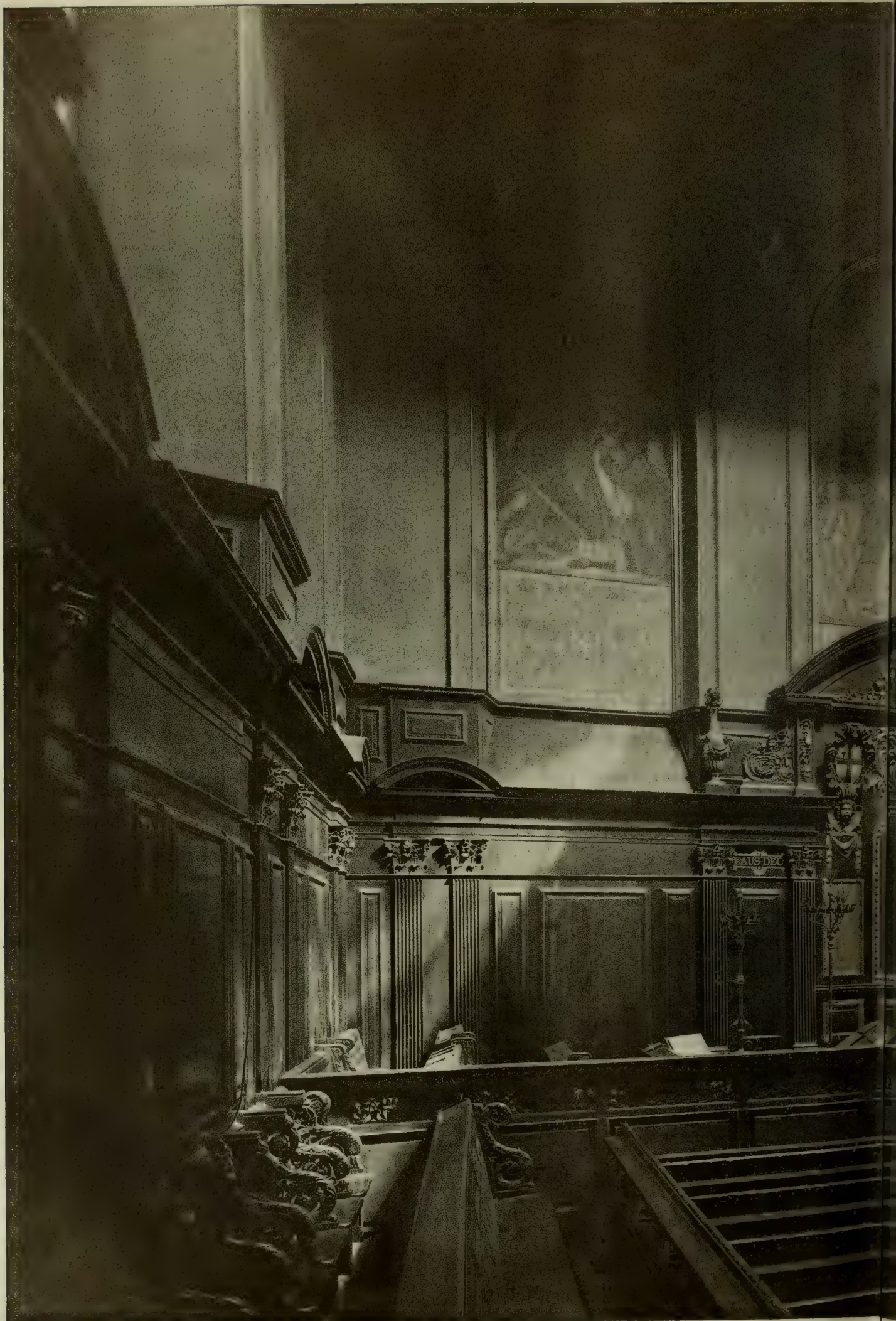


First Floor Plan







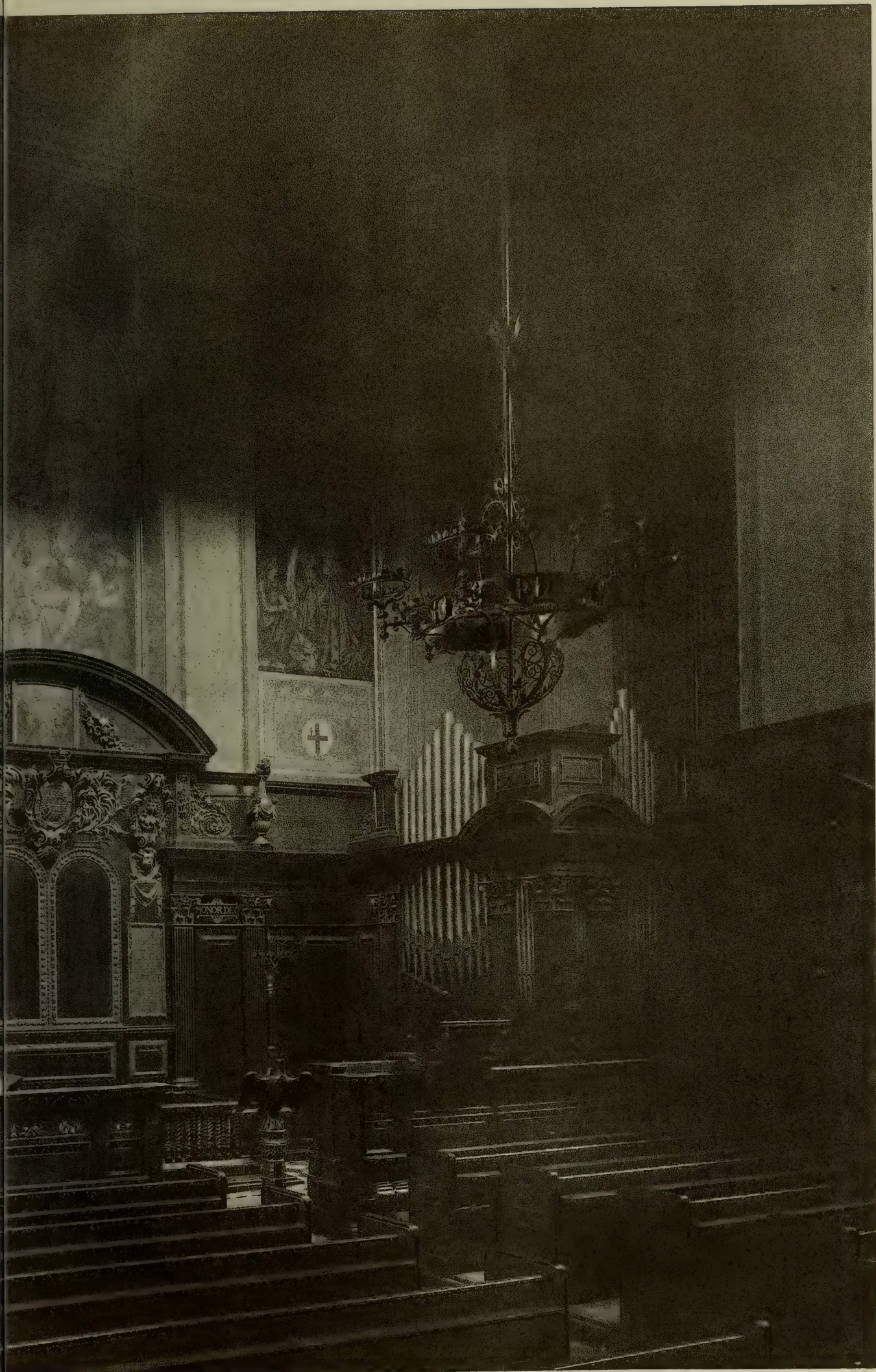


PHOTOGRAPHED WITH A SANDELL PLATE.

THE CITY GUILD HALL  
THE HALL OF THE MERCERS



MAR. 26, 1897.



"PHOTO-TINT" by James Akerman, 6, Queen Square, London, W.C.

LDS · No 32 ·  
COMPANY · THE CHAPEL







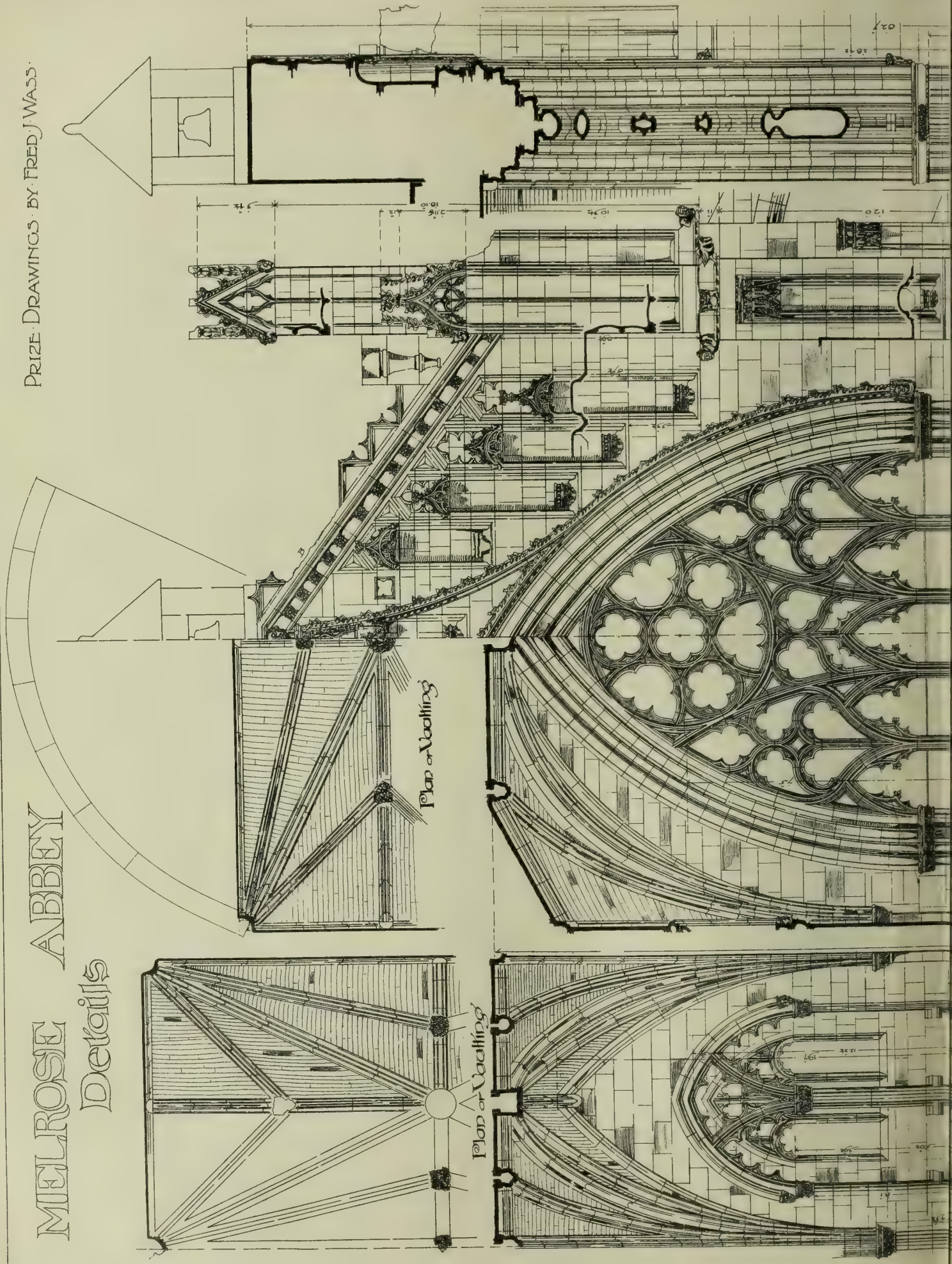




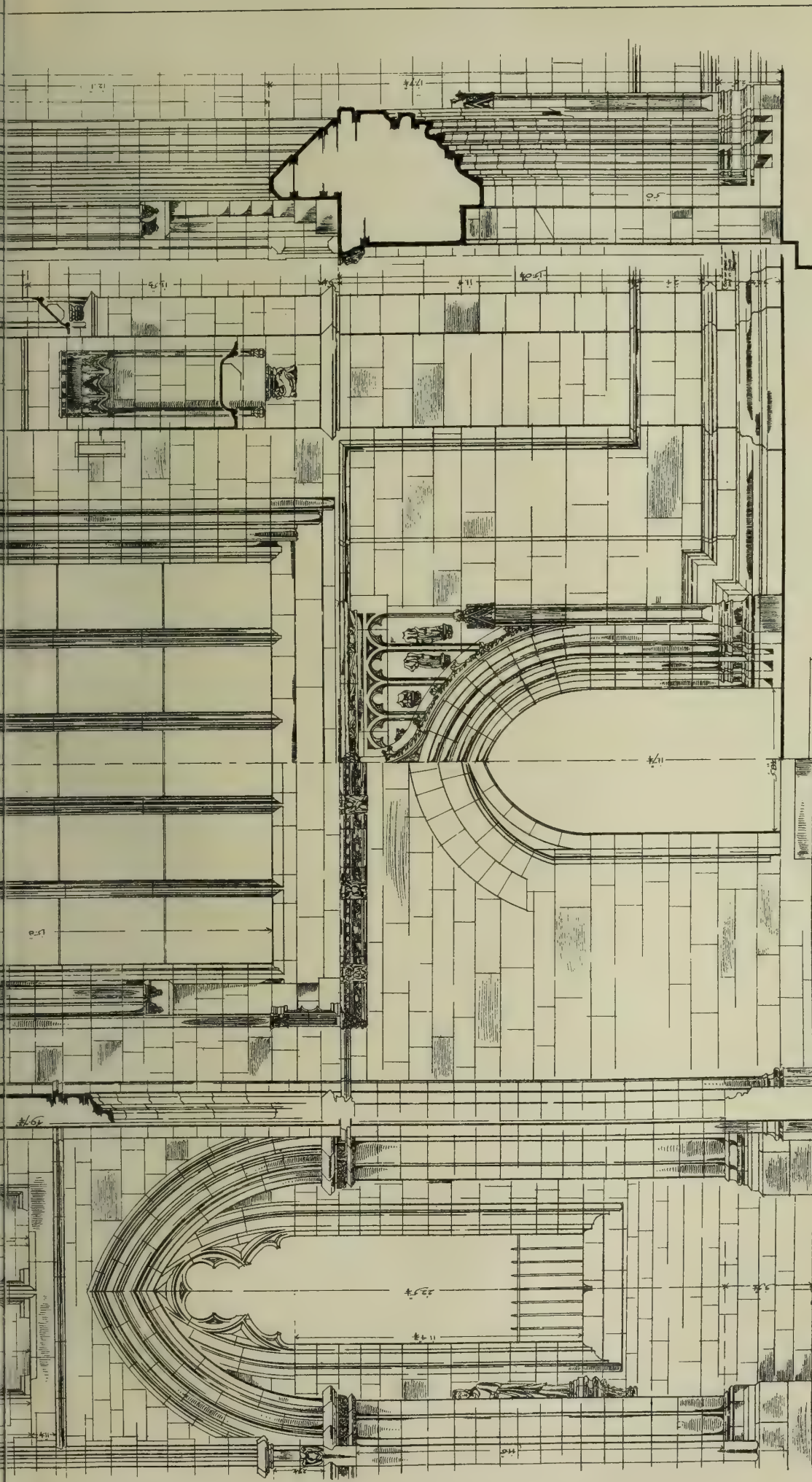
# MIELROSE ABBEY

## Details

PRIZE DRAWINGS BY FRED J. WASS.







Elevation or Bay  
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PLAN



SCALE OF  
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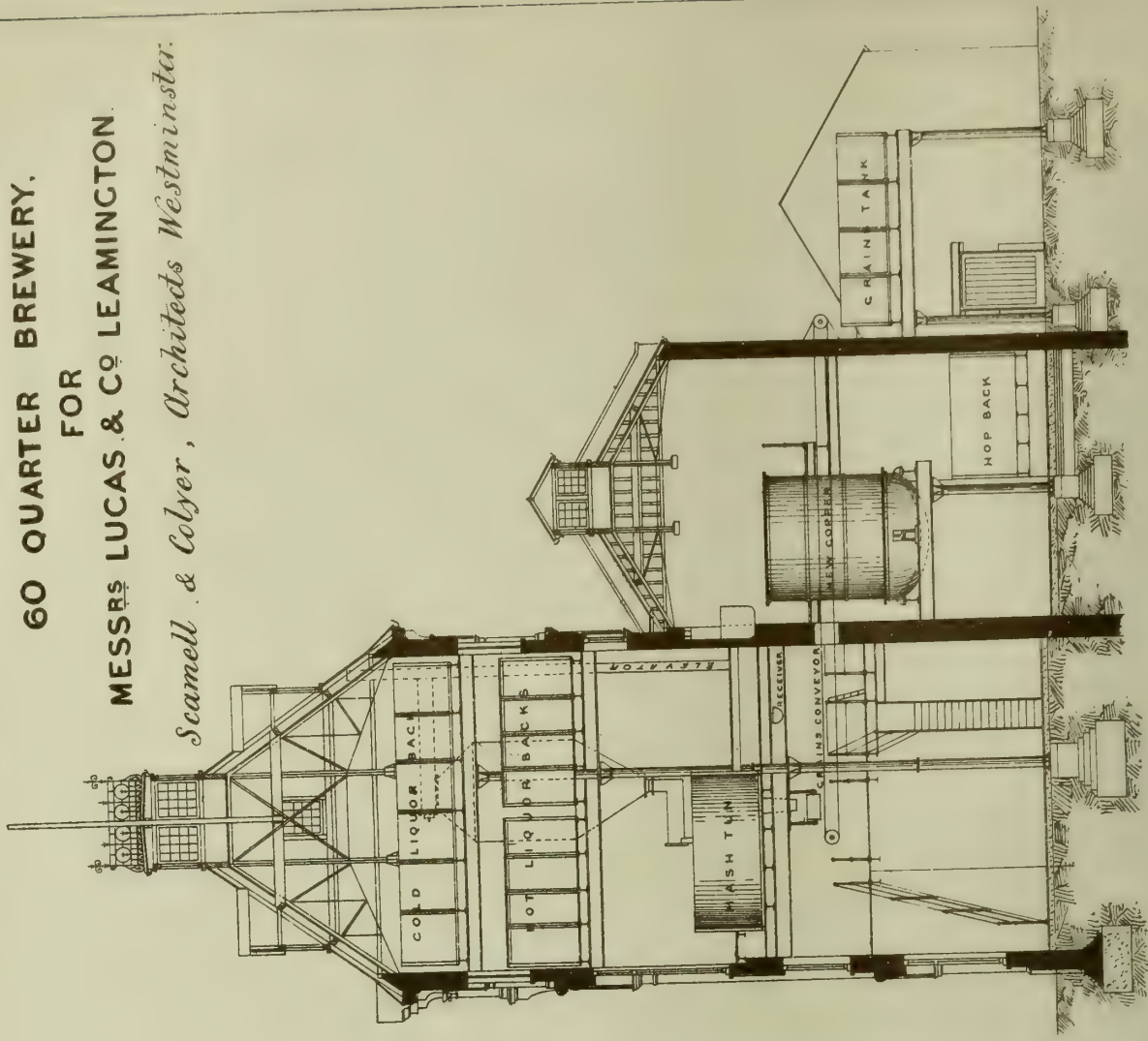




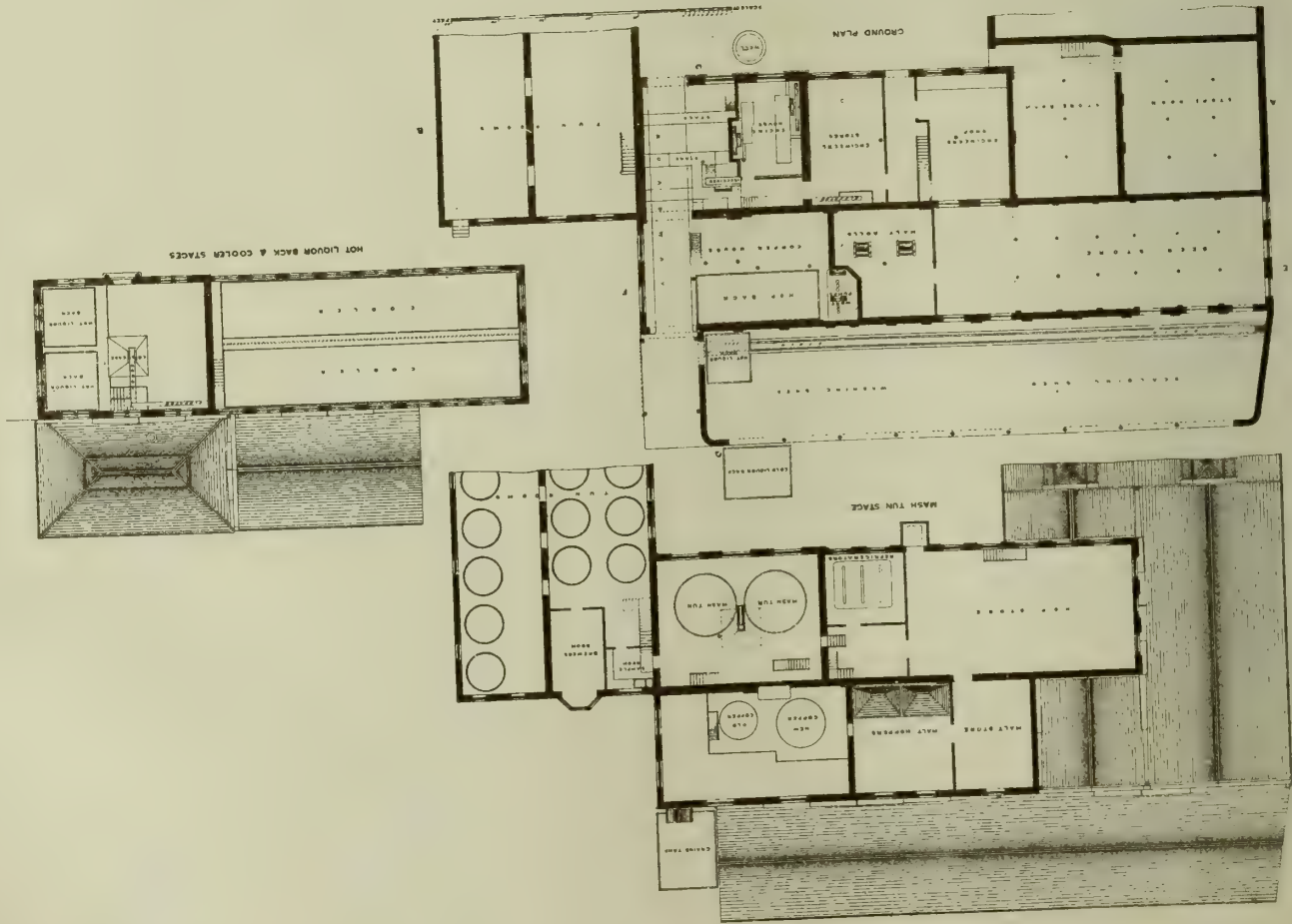


60 QUARTER BREWERY.  
FOR  
MESSRS LUCAS & CO LEAMINGTON.

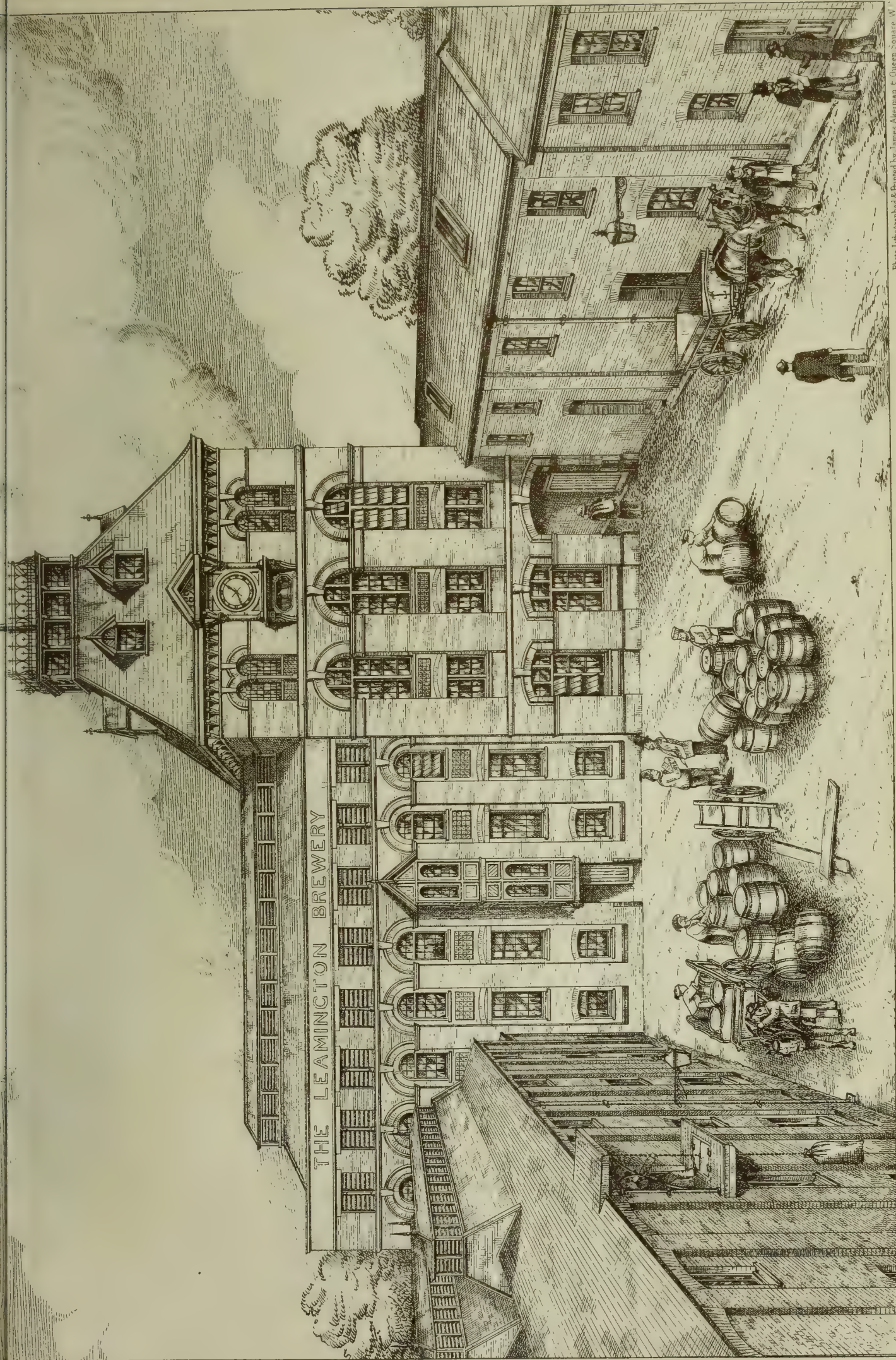
*Scamell & Colyer, Architects Westminster.*



TRANSVERSE SECTION C-D





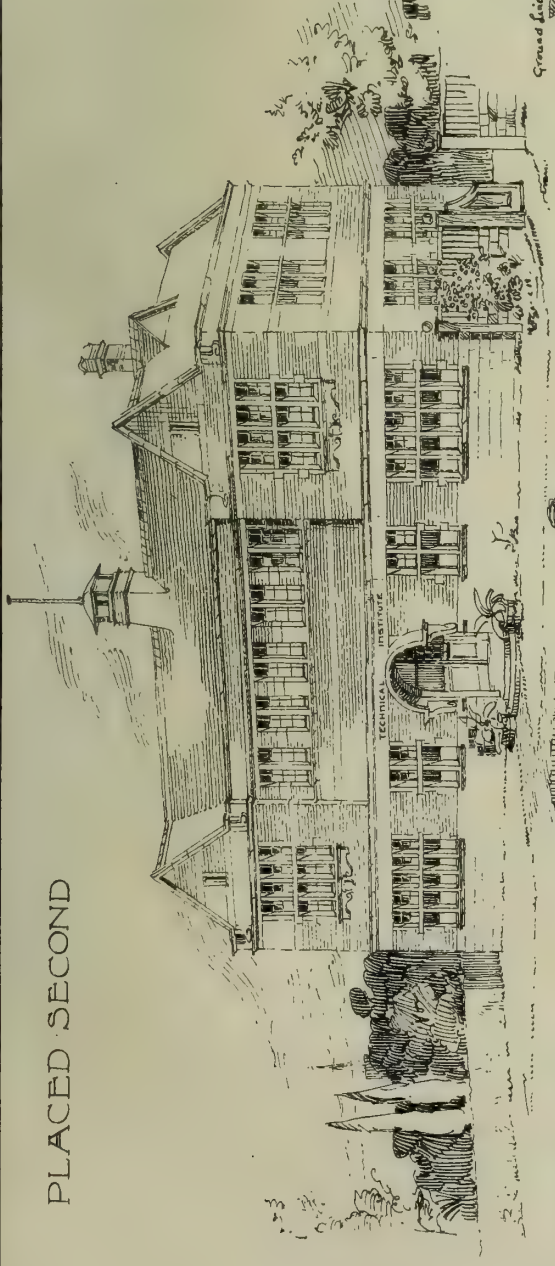




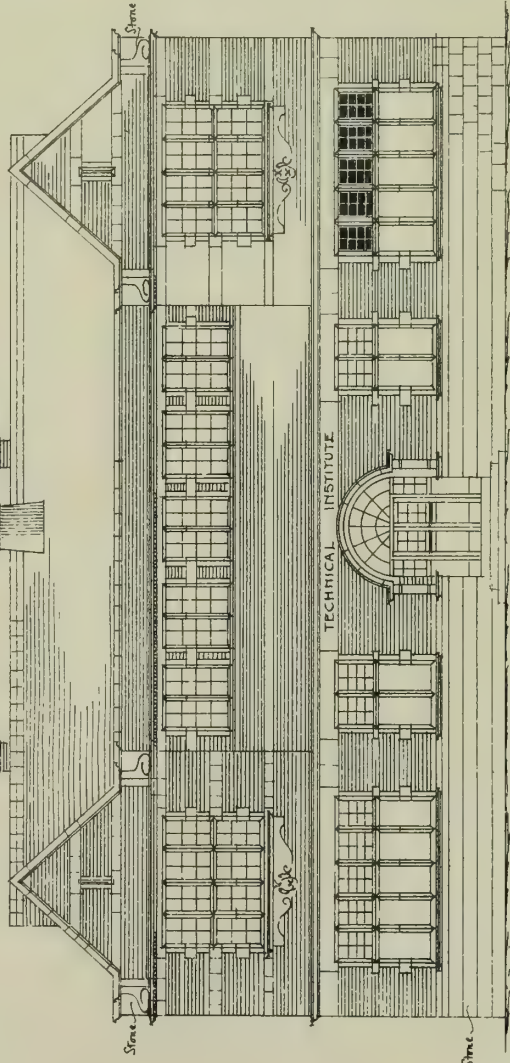
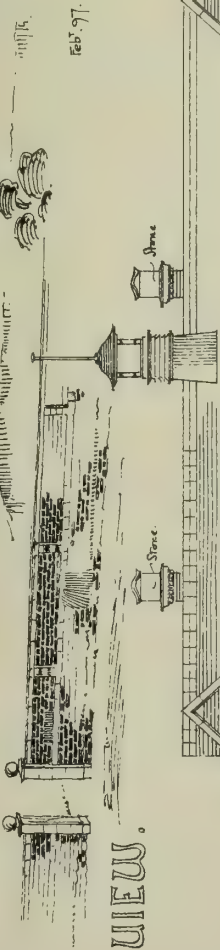




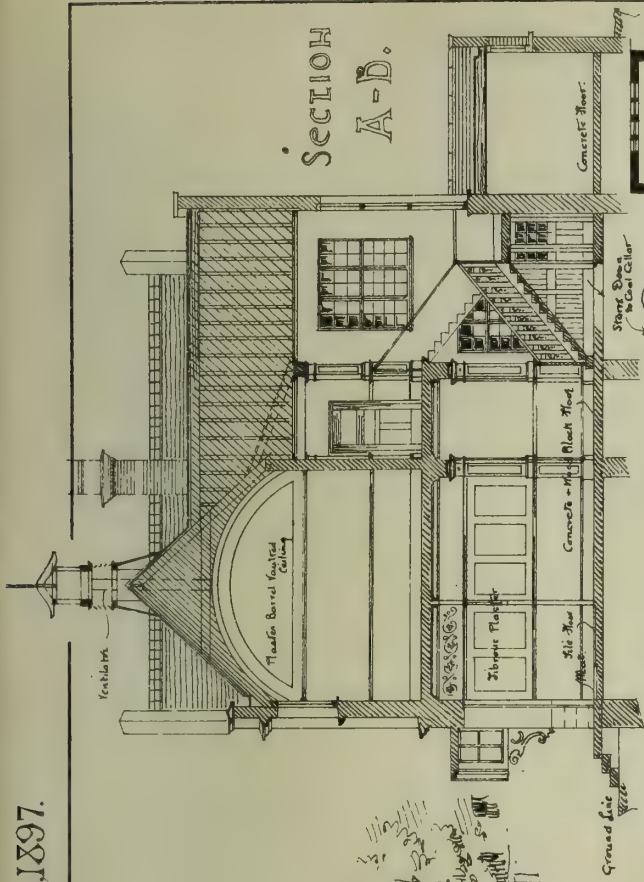
PLACED SECOND



VIEW.



ELEVATION.



B.N.D.C. BY  
A SMALL  
TECHNICAL  
INSTITUTE, TO COST  
£3000.

B.N.D.C. BY

A SMALL  
TECHNICAL

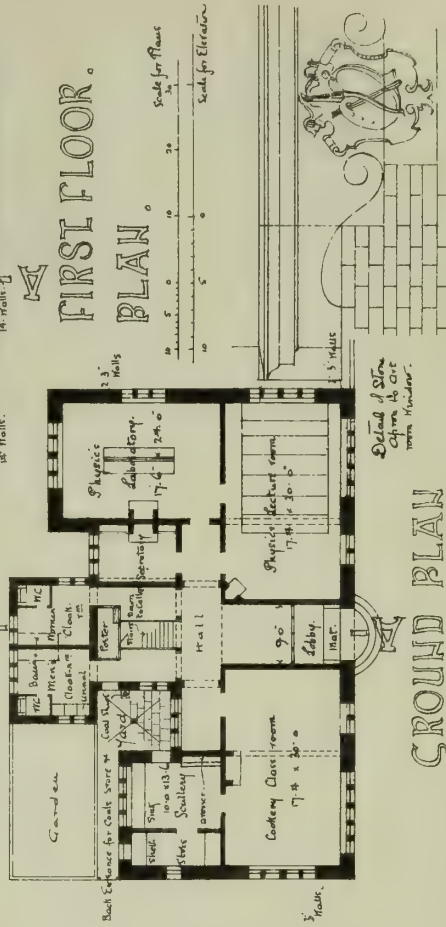
INSTITUTE, TO COST  
£3000.

B.N.D.C. BY

A SMALL  
TECHNICAL

INSTITUTE, TO COST  
£3000.

FIRST FLOOR.  
PLAN.



GROUND PLAN

Detail of Stone  
Chimney to be  
seen from  
Main Entrance.







## LEGAL INTELLIGENCE.

**ALLEGED NUISANCE FROM BRICKFIELDS.**—In the Queen's Bench Division of the High Court, on Friday, before Mr. Justice Hawkins and a special jury, the Attorney-General, on the relation of the Tottenham District Council, sought an injunction to restrain Messrs. Williamson and Sons (Limited), brickmakers and dust contractors at Tottenham, from using brickfields of which they are occupiers in such a way as to create a nuisance. Some witnesses to the nuisance having been called, the jury intimated that they did not want to hear any more evidence of that kind. For the defence the managing director of the defendant company denied that there was any nuisance caused by them. The jury sent a communication to the learned judge to the effect that they considered there was no evidence of an actionable nuisance. Counsel for the plaintiff then said he would not proceed further, but would go to the Court of Appeal. Judgment was entered for the defendants.

**THE WORKING-CLASS-DWELLING SECTIONS OF THE BUILDING ACT SUCCESSFULLY EVADED.**—At the Worship-street Police Court on the 17th inst., Mr. Hyman Davis, builder and property owner, of 65, Bishopsgate-street Without, appeared before Mr. Haden Corser in answer to a summons taken out by the London County Council for having failed to comply with a notice calling upon him to set back the front wall of No. 105, Brick-lane, Spitalfields, so that every part thereof should be at a distance in every direction not less than the "prescribed distance" from the centre of the roadway (viz., 20ft.) in accordance with sections 13, 14, and 200 of the London Building Act, 1894, the said house having recently been erected at a distance of only 12ft. 1in. from the centre of the roadway to a height exceeding the width of the street, and being alleged to be now occupied by persons of the working class. Mr. T. Seager Berry, in opening the case for the London County Council, drew the learned magistrate's attention to the fact that there was no definition in the London Building Act of the term "persons of the working class," but referred him to the definition embodied in section 75 of the Housing of the Working Classes Act, 1890, which limited the term "letting for habitation by persons of the working class" for the purposes of that section to "letting a house or part of a house at a rent not exceeding in London £20 a year." There was, however, a further definition which might be of assistance—namely, that contained in the Standing Orders of the House of Commons, and embodied in the South Eastern Railway Co.'s Act, 1896, and many other railway companies' Acts, which was as follows:—"The expression, 'labouring class,' means and includes mechanics, artisans, labourers, and others working for wages, hawkers, costermongers, persons not working for wages, but working at some trade or handicraft without employing others except members of their own family and persons other than domestic servants whose income does not exceed an average of 30s. a week, and the families of any such persons who may be residing with them." He then pointed out the conditions under which a builder was entitled to build within the prescribed distance, as set forth in subsection 5 of section 13—viz., that where it was desired to alter or re-erect a building existing either at the commencement of the Act or at any time within seven years previously, and which stood within the prescribed distance, it was permitted by the Act to do so, provided that the builder got the plans of the old building certified by the district surveyor; but the privilege in subsection 5 was restricted by the following proviso:—"Provided always that no dwelling-house to be inhabited, or adapted to be inhabited, by persons of the working class shall without the consent of the Council be erected or re-erected within the prescribed distance to a height exceeding the distance of the front, or nearest external wall of such building, from the opposite side of such street, and that no building or structure shall be converted into such dwelling-house within the prescribed distance so as to exceed such height." He contended that Mr. Davis had lost the privilege conferred by that section, inasmuch as the building had been erected within the prescribed distance to a height exceeding the width of the street, and was now occupied by persons of the working class, and that by section 206 the exemption or privilege enjoyed ceased when the building became used by persons of the working class, and the building thereupon became subject to the provisions of section 13 (1). He also contended that this was not an alteration or re-erection within the meaning of section 13 (5), inasmuch as the owner had erected 11 houses, each four stories high, with no back yard, on a site previously occupied by 10 houses, each three stories high, and each having a back yard. The case against No. 105 was taken as a test case, the Council contending that the decision on such case would govern each of the remaining 10 houses of the block. Mr. Arthur Crow, F.R.I.B.A., district surveyor for Spitalfields, was then called, and stated that the house in question was one of a row of eleven houses erected by Messrs. Davis Bros. in 1895, from plans prepared by Mr. H. H. Collins,

F.R.I.B.A., F.S.I. The site of the present houses was formerly occupied by 10 houses, each of three stories, and having yards at the rear. The plans of those old houses were duly certified by him in accordance with section 13 (5) of the Act. (The certified plans were then put in evidence.) He examined the plans of the new buildings, and approved them on the understanding that the houses were not designed for persons of the working class. The accommodation shown by Mr. Collins's plans included a shop and back room on the ground floor, and three floors over with two rooms on each floor. The buildings were duly proceeded with and inspected by him from time to time. On Jan. 23, 1896, he found that six houses had been roofed in, and were being fitted up for occupation; that in each house the back rooms on each floor were prepared to receive ranges, and that in No. 107 ranges had been fitted on the ground and first floors. On Jan. 24 he served notices of irregularity, which were produced, objecting to the houses under sections 13 and 41, on the ground that they were being adapted for working-class dwellings. In reply he received a letter from Mr. Collins, which he produced, stating *inter alia* that, "as you must be aware, these buildings have never been erected for, nor are they intended, for the occupation of the artisan and labouring classes." Thereupon he consulted the Council's advisers, and having regard to that letter no action was taken. In October last his attention was called to the houses, and he inspected them and found that they were sublet to various sub-tenants. Dealing with No. 105, the whole house was let by Mr. Davis to Israel Cohen, a working clockmaker, at £2 a week, who, with his wife and family, occupied the ground floor. Each floor above was sublet by Cohen to a separate family at 8s. 6d., 8s., and 6s. a week respectively. Each sub-tenant was a cabinet-maker by trade. He put in a plan showing the house as at present existing. In cross-examination by Mr. Marshall Hall, who appeared for Mr. Davis, witness said, assuming the house not to be a working-class dwelling, it did not infringe the Act as regards the line on which it fronted; but the party-walls were not coincident with the old party-walls; that he made a return to the Council of the houses when they were roofed in; that he had been paid his fees as district surveyor, and that he thought the house was adapted for persons of the working class, because it, and the others in the block, were so occupied. Mr. Thomas Blashill, F.R.I.B.A., F.S.I., Superintending Architect of Metropolitan Buildings, said that he had seen the house in question, that Brick-lane was a highway, and that the Council had given no consent to the building, which was inside the prescribed distance. In cross-examination witness said that if the Council's views were correct, a very large number of East-end houses, and some West-end houses, in poor-class neighbourhoods, would be affected by it. Inspector Harvey, of the White-chapel District Board of Works, said he had inspected the houses on several occasions. He confirmed the district surveyor as to the occupation, and added that in No. 111 the two upper floors (four rooms) were occupied by a man, to whom they were sub-let at 15s. per week, with his wife and three children and ten lodgers. At No. 115 there were three single-room sub-tenancies, two by a laundress and an office charwoman, each paying 3s. 6d. a week rent. In reply to the magistrate, he said the cooking in the upstairs rooms was done at open stoves. There were two w.c.'s in each house. Dr. Loane, Medical Officer of Health for White-chapel, said he had visited the houses, and he produced some photographs of them. The tenant Cohen and one sub-tenant were called, and corroborated as to rents and occupations. The tenancy agreement with Cohen was produced, together with his rentbook, containing rules to be observed by the tenants. The magistrate, in giving judgment, without calling on Mr. Marshall Hall, said: The question I have to decide is whether the houses are within the meaning of Section 13 (5) of the Building Act, "dwelling-houses to be inhabited, or adapted to be inhabited, by persons of the working class." If they are, they are within the prescribed limits, and must be set back. If they are not, they may remain. There is nothing to guide me as to what is meant by "persons of the working class," except Section 75 of the Housing of the Working Classes Act, 1890 (which he read). If this is to be a guide, it is a money guide—viz., an annual rent of £20 for a house or part of a house. I must, however, look at the facts of the case. I need not go through the various sections, since the parties agree that what I have to decide is whether this house is a house to be inhabited, or adapted to be inhabited, by persons of the working class. I should mention the South-Eastern Railway Company's Act of 1896. (The magistrate then read the section which is quoted above.) That section seems as if, after exhausting every class named therein, anyone else earning less than 30s. a week was of the labouring class. The person to whom this house is let is Cohen, at a rent of £2 a week. He is a watchmaker, and occupies the ground floor. Above are

first and second floors and a floor in the roof. The house is set out as a house would be in Piccadilly, if designed for a shop with living-rooms over. How could you erect differently a shop with living-rooms over? I must not look at the passing character of the tenants, but at the house. Every place of bricks and mortar can be lived in by persons of the working class if they can afford it. Cohen has grossly overcrowded his premises, which are occupied by persons who work with their hands for their daily bread; but that cannot alter the intention of Davis when he built the house, it cannot alter the character of the house. The Legislature intended houses for persons of the working class to have a reasonable provision of air-space in front, because more people live on the premises. Davis says: "I don't want the working class." I must find that these houses are not houses to be inhabited or adapted to be inhabited by persons of the working class. The people living there are, in my judgment, persons of the working class. Many rooms are occupied by persons strictly and accurately described as persons of the working class." The summons was accordingly dismissed with *ter guineas* costs, the magistrate expressing his readiness to state a case for the Superior Court. The defendant's counsel said that defendant would himself like to have a case stated.

**LEIGH, LANCs, ARBITRATION AWARDS.**—The awards of Mr. W. Ambrose, Q.C., M.P., the arbitrator appointed by the Local Government Board to hear claims amounting to £17,619 by property owners and tenants against the Leigh District Council, as compensation for property sought to be acquired for public improvements, has been received. The total amount offered by the council was £5,876, and the total amount of the awards is £6,797, or about 15 per cent. more.

**RE C. HOPKINS.**—Under the failure of Christopher Hopkins, builder, East Ham, accounts have been filed showing total liabilities £3,788, of which £651 is unsecured, and assets £947, subject to realisation. The debtor attributes his present position to his inability to realise freehold and leasehold properties in which he is interested. His affairs are being wound up in bankruptcy.

**A LIVERPOOL SURVEYOR'S CLAIM.**—**SUTCLIFFE v. BOLAND.**—Mr. Taylor, Q.C., and Mr. Broadbridge appeared for the plaintiff in this undefended action, heard by Mr. Justice Kennedy at the Liverpool Assizes recently. The claim made by the plaintiff, Albert Richard Sutcliffe, surveyor, Liverpool, was for £166 3s., for work done, such as the preparation of plans and specifications, and commission earned in respect of work for the defendant, Patrick J. Boland, dealer in land, in connection with the development of the new Rhyl estate in North Wales. Plaintiff gave evidence of having carried out certain instructions at the request of defendant, and of having written letters in respect of negotiations for the sale of some of the land. The estate covered about 179 acres. His lordship gave judgment for the amount claimed, with costs.

**DRAIN OR SEWER? — APPLEYARD v. THE LAMBETH VESTRY.**—In the Court of Appeal, last week, the Master of the Rolls, Lord Justice Lopes, and Lord Justice Chitty heard an appeal from the judgment of Mr. Justice Hawkins at the trial of the action without a jury, reported in our issues of Nov. 20 and Dec. 11, 1896, pp. 757 and 866 last Vol. The action was brought for a mandamus calling upon the defendants to repair and cleanse certain sewage or drainage pipes, which conveyed the drainage of four houses, and the question was whether the pipes were sewers, in which case the defendants would be bound to repair and cleanse them, or drains, in which case the duty of keeping them in repair would rest upon the owners of the houses. Definitions of "sewer" and "drain" are given in section 250 of the Metropolitan Management Act, 1855. The word "sewer" means and includes sewers and drains of every description except drains to which the word "drain," interpreted as it is in that section, applies. The word "drain" means and includes "any drain of, and used for the drainage of, one building only, or premises within the same cartilage, and made merely for the purpose of communicating with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed; and shall also include any drain for draining any group or block of houses by a combined operation under the order of any vestry or district board." Section 112 of the Metropolitan Management Act, 1862, extends the definition of "drain" so as to include "any drain for draining a group or block of houses by a combined operation laid or constructed before the 1st of January, 1856, pursuant to the order or direction, or with the sanction or approval of, the Metropolitan Commissioners of Sewers." The houses which were drained by the pipes in question were built in 1833, and the pipes were laid at the same time, and the drainage as then constructed remained till the present time. The drainage authorities at that date were the Commissioners of Sewers.



for Surrey and Kent. The Metropolitan Commissioners of Sewers were created in 1848 by the Statute 11 and 12 Vict., c. 112. Mr. Justice Hawkins held that the pipes were not drains within section 112 of the Act of 1862, and were therefore sewers, and he gave judgment for the plaintiff granting the mandamus which was prayed for. The defendants appealed, and contended that the expression "Metropolitan Commissioners of Sewers" used in section 112 of the Act of 1862 was not confined to the body created by the Act of 1848, but included the previously-existing Commissioners of Sewers for Surrey and Kent. The Court, without calling upon counsel for the plaintiff, dismissed the appeal, and upheld the judgment of the learned Judge.

**A LLANDUDNO BUILDING APPEAL.**—On Friday, in the case of Broomfield v. Williams, the judgment of Lords Justices Lindley, A. L. Smith, and Rigby was delivered upon the appeal of the plaintiff against the order of Mr. Justice Kekewich, dismissing his action with costs. The appeal was argued on the 23rd and 25th of February. The plaintiff bought the freehold of a piece of land, with a dwelling-house thereon, fronting Mostyn-avenue, Craig-y-don, Llandudno, from the defendant, who was the owner of adjoining land, on which, as the plaintiff knew, he was entitled to build. There was no reservation, however, of any right to darken the windows, and the ground of the action was that the building which the defendant had erected darkened the kitchen and other windows on the west side of the plaintiff's house. Mr. Justice Kekewich found that the access of light was materially interfered with, but came to the conclusion that the plaintiff had no right of action. Their Lordships, in their judgment, stated that they were surprised to find that there should be any doubt as to the right of the plaintiff to enjoy the light conveyed to him unobstructed by the grantor, who could not derogate from his own grant. If the right was to be limited it was for the grantor to show what the limitations were. The defendant had exceeded his right, and the appeal must be allowed. The order would be in the following form:—Declare that the defendant was not entitled so to build on land adjoining the plaintiff's house as to create any material obstruction to the light which came to the kitchen and other windows on the west side of the plaintiff's house at the time of the grant by the defendant to the plaintiff. And the defendant not claiming any damages by reason of any obstruction to such windows which would have been caused by the defendant's house if it had been set back 4ft. 9in. from the wall bounding the plaintiff's land on the west side, inquire what damages the plaintiff had sustained by reason of the obstruction of light to the said windows occasioned by the defendant's house not being so set back, and order defendant to pay such damages when ascertained. Liberty to apply, defendant to pay the costs of the action and of the appeal.

**EXTRAS AND PENALTIES FOR DELAY.**—**DODD V. CHURTON.**—In the Court of Appeal, on Friday, before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Chitty, judgment was given in this action, brought by a builder against the building owner to recover the balance due under a building contract. The action was tried in the Whitechurch County Court. The claim was admitted, but there was a counterclaim by the building owner to recover £50 as liquidated damages for delay in completing the work. By the contract the plaintiff undertook to make certain alterations and additions to the defendant's house for £664 as set forth in the specification, and according to the general conditions annexed thereto. Clause 4 of the general conditions ran:—"Any authority given by the architects for any alteration or addition in or to the works is not to vitiate the contract, but all additions, omissions, or variations made in carrying out the works for which a price may not have been previously agreed upon are to be measured and valued and certified for by the architects, and added to, or deducted from, the amount of the contract as the case may be, according to the detailed schedule of prices on which the contract was formed. The schedule of prices to apply to all deductions and to additions up to 15 per cent. above the amount of the contract; any additional works beyond 15 per cent. above the amount of the contract and any item to which the schedule of prices does not apply to be allowed for at such prices as the architects may consider fair and reasonable." Clause 24:—"... the whole of the works to be completed by the first day of June, 1892, under a penalty of £2 per week for every week that any part of the works remains unfinished after that date as liquidated damages." Extra works to the amount of £22 18s. 8d. were ordered, and the total works were not completed until 27 weeks after the time specified for completion. The defendant, after allowing two weeks additional time for the completion of the extra works ordered, counterclaimed for £50, being £2 per week for 25 weeks, as liquidated damages for the delay in completion. The County Court Judge held that the ordering of the extra works was a waiver of the stipulation to pay damages for delay, and gave

judgment for the plaintiff on the counterclaim. In the Divisional Court Mr. Justice Wills agreed with the County Court Judge, while Mr. Justice Wright differed. The judgment of the County Court Judge therefore stood. The defendant appealed. The following cases were referred to:—"Holme v. Guppy," "Thornhill v. Neats," "Russell v. Da Bandeira," "Westwood v. Secretary of State for India," "Jones v. St. John's College." The Court dismissed the appeal. The Master of the Rolls said that the question was whether the building owner was entitled to claim certain penalties by way of liquidated damages from the builder on account of the works not having been completed in the specified time. It was said that the building owner disintitiled himself from claiming the penalties by having ordered extra work to be done beyond that provided for in the specification. The extra work admittedly delayed the completion beyond the time that would have been occupied in executing the specified works. The contract gave the building owner the right to call upon the builder to do extra works. A recognised rule had been laid down in "Holme v. Guppy" that, if the building owner ordered extra works beyond the specified works which increased the time necessary for completion, the building owner was disabled from claiming penalties for delay in completion. If that were not so, it would be a most unreasonable burden to put upon the builder to do extra works, and then if the whole works were not completed within the specified time to claim the specified penalties from him. Then, it was held in "Westwood v. Secretary of State for India" that the fact that the contract entitled the building owner to call upon the builder to do extra works did not prevent the application of the above rule. Then came "Jones v. St. John's College," which was an exception to that rule. In that case it was stated in the pleadings that the builder had agreed, if extra works were ordered, to complete the entire works within the stipulated time. The Court held that if the builder was foolish enough to agree to that, even though it became impossible to complete the works within the time, he must take the consequences. In the present case the builder did not by the agreement undertake such a foolish responsibility. The rule of construction was that if a particular construction led to an unreasonable result the Court would be slow to adopt that construction. In "Jones v. St. John's College" the contract was set out in the pleadings and admitted on demurrer. The present contract could not be construed as was the contract in Jones's case. Therefore, the building owner, though entitled by the contract to order extra works, had, by ordering the extra works, deprived himself of the right of claiming the penalties for delay. They would, therefore, adopt the judgment of Mr. Justice Wills in preference to that of Mr. Justice Wright. The Lords Justices delivered judgment to the same effect.

**IN RE T. P. JONES, OF LLANELLY.**—At Carmarthen Bankruptcy Court, on Wednesday week, Thomas Pugh Jones, contractor, builder, and builders' merchant, Llanelly, underwent his public examination. His gross liabilities amounted to £9,228 16s. 7d., it being expected that £4,335 13s. 2d. would rank for dividend. In June, 1889, debtor commenced business as a builder and contractor at Llanelly with a capital of £100. During the past three years he had also been a builders' merchant. At his preliminary examination in January last he stated that he was not aware that he was insolvent, but his statement now showed a deficiency of nearly £2,000. The debtor intends to offer a composition. The examination was adjourned.

**SUCCESSFUL APPEAL IN A BUILDING CASE.**—Lloyds Banking Company, in an action against them, heard at Cardiff February Assizes by Justice Grantham and a common jury, at the suit of David Griffiths and Co., for a builder's account respecting the completion of two villas, appealed on the 10th inst. to the Master of the Rolls and Lords Justices Lopes and Chitty for judgment or a new trial of the action, on the ground that the verdict for the plaintiffs was against the weight of the evidence. The action was brought to recover £300 7s. 6d., and the chief point in dispute was whether the work was done under contract by tender, as defendants alleged, or, as it was the plaintiffs' case, by day-work. On behalf of the bank, appealing from the judgment against them, Mr. Abel Thomas, Q.C., now based their appeal largely on the ground of the concealment by plaintiffs, until a day or two before the trial, of one of their books containing entries which, it was submitted, were consistent with the architect's certificates, and also bore out the defendants' plea in resisting the claim; but, though this book and entry were now admitted, on the evidence of plaintiffs' clerk, who on the trial deposed that he kept it for contract purposes, Mr. Brynmor Jones, respondent plaintiffs' counsel on this appeal, put it that the use of the book was either a blunder on the part of the clerk, or that, in view of then pending changes in the plaintiffs' firm, he used it for other than contract purposes. At the close of two half-days' arguments, reviewing the whole trial below,

the Master of the Rolls said: Considering the evidence we have heard, and the report of the learned Judge who presided at the trial, there cannot be a doubt that there must be a new trial of the case. The Lords Justices both concurring, a new trial was granted accordingly. A discussion followed on the question of costs, and the question was ordered to stand over until the new trial had taken place, and then to be the subject of an application.

**RE EDWARD HULL, BIRMINGHAM.**—In this case the debtor was described as of 57, Holdford-road, Handsworth, carpenter, lately carrying on business under the name of Edward Hull, of Whitehall-road, Small Heath, as a builder and contractor and bricklayer, and under the name of Taylor and Co., at Villa-road, Aston, as a builder and contractor. The first meeting of creditors was held on Friday. The statement of affairs shows debts £1,377 19s. 9d., and assets £10. In 1874 his uncle, to whom the bankrupt had acted as manager, died, and left him a builder's business at Shrewsbury, Warwickshire, with a plant and stock valued at £100. In 1880 he disposed of the business for £60. and removed to Birmingham, where he traded as a speculative builder, and built houses with funds advanced upon progressive mortgages. In 1889 he became tenant of brickworks at Charlton-road, Small Heath. In 1891 he privately arranged with his creditors, and paid a composition of 5s. in the pound. In 1893 he disposed of his stock and plant at the brickworks, and realised about £600. This he distributed among his creditor, but it was insufficient to discharge the whole of his liabilities. He then removed to Aston, his wife's relations lending him £50, and the business was conducted under the name of Taylor and Co. In 1894 the bankrupt contracted to build forty-two houses at Smethwick. He finished thirty, but was unable to complete the others owing to the want of the funds. In July, 1896, he was building six villas at Stratford-road, which he also left unfinished. Since then he has been working as a journeyman carpenter. The only book of accounts he kept was a wages book.—The debtor has been summarily adjudicated bankrupt, and the Official Receiver is trustee.

#### CHIPS.

The badge which is to be worn, with collar, by the Queen's permission, by Sir James Linton and future presidents of the Royal Institute of Painters in Water Colours was designed and executed by Mr. Alfred Gilbert, R.A. The badge, exhibited at the Royal Academy in 1894, is of gold, jewelled and enamelled. In the centre is a female figure, representing water-colour art, standing on a nautilus shell, and the background consists of emblematical work with a monogram of her Majesty surmounted by a Royal crown.

The foundation-stones of a new mission church at Tat Bank, Oldbury, were laid on Tuesday. The new church is to be Gothic in style, will cost £1,400, and will accommodate 250 persons. Mr. Lavender, of Walsall, is the architect, and Mr. Kendrick, also of Walsall, the builder.

At the North London Police-court on Tuesday, Mr. D'Eyncourt dismissed a summons taken out at the instance of the London County Council against one Faulkes, a builder, of Stoke Newington, for laying-out a road on the north side of Carysfort-road which did not communicate at each end with public carriage-ways, without the consent of the Council. The magistrate granted the defendant £12 12s. costs, and said he would consider an application to state a case for a superior Court.

By an action which was tried in the Queen's Bench Division, on Tuesday, it was sought to make the corporation of Great Yarmouth compensate Mrs. Durrant and her two sons for the loss of her husband, who died of typhoid fever, through, as alleged, defective sewers, which led to the poisoning of a well. After hearing the evidence, the jury returned a verdict for the defendants, whose counsel undertook not to press for costs if the case were carried no further. In giving judgment, Mr. Justice Hawkins said the case ought to have been tried on circuit, instead of incurring the expense of a trial in London.

Mr. John Usher, of Norton, N.B., has given £8,000 towards the foundation of the Chair of Public Health in the University of Edinburgh. The chair is likely to be instituted at an early date.

In the Court of Appeal, on Friday, before the Master of the Rolls and Lords Justices Lopes and Chitty, an appeal was heard of the Oswaldtwistle District Council against a judgment of Mr. Justice Charles granting a mandamus, applied for by the executors of a paper manufacturer named Peebles, who had a factory within the appellants' district, commanding the appellants to make such sewers as might be necessary for effectually draining their district under the Public Health Act, 1875, and in particular the plaintiffs' premises. Their Lordships allowed the appeal and reversed Mr. Justice Charles' judgment, holding that the proper remedy was by complaint to the Local Government Board.



## Building Intelligence.

**DUDLEY.**—Arrangements are in progress for the erection in Dudley of a new theatre and opera house, capable of accommodating 2,000 people, at a cost estimated at between £8,000 and £10,000. The site comprises 3,160 square yards of land in the Birmingham road, between the Lower Castle Lodge and the railway station drive. There will be a frontage of 66 yards. The opera house will be set back 15ft. from the pathway. The width of the site will provide for arcades on both sides of the theatre, with a single line of shops in each. The arcades will be so constructed as to make a continuous promenade round the main building. There will also be, according to the present scheme, two shops on each corner facing the Birmingham-road. The auditorium will consist of pit-stalls, a large pit, centre and side dress circles, and six private boxes in the first tier, and an amphitheatre in the second tier, at the back of which there will be a gallery. The plans have been prepared by Mr. A. Ramsell, of Dudley.

**EDINBURGH.**—The Free Gardeners' Hall in Picardy-place, Edinburgh, was formally opened on Friday night. The frontage, which has been brought out to the street, has been treated in the Spanish Renaissance style, with clustered columns, bases and capitals, the whole of the front being surmounted with a cornice and balustrade. There is an elliptical doorway, over which is a circular pediment, on which is carved cartouche work, interwoven with the emblems of the Order. A reception-room, or saloon, occupies the front part of the ground-floor, and in the rear is the large hall, which accommodates an audience of over 500 people. Messrs. Dunn and Findlay were the architects. The property cost £4,000, and £5,000 has been expended on alterations, raising the entire outlay to £9,000.

**FALMOUTH.**—The tender of Messrs. Rickard and Son, of Penryn (the lowest of six sent in), has been accepted for carrying out the first portion of the parish church restoration scheme. The entire undertaking will entail an outlay of £3,500 or £4,000, but the estimated cost of the work involved in the present contract is from £1,200 to £1,300, towards which about £1,000 has been subscribed. The work includes the erection of an entirely new roof, the removal of the side galleries, and the enlargement of the west gallery. The granite pillars, which are out of perpendicular, are also to be put right. In addition, two marble pillars with alabaster capitals are to be erected at what will be the site of a new chancel if property adjoining can be acquired for the purpose of extending the church so as to give more seating accommodation in the body of the building.

**GREAT BENTLEY.**—On Monday new schools recently erected by the Great Bentley School Board, near Bentley Railway Station, were opened. The school and master's residence are carried out in the modern Queen Anne style, being built of red brick relieved with Bath-stone dressings. The roofs are covered with brown Broseley tiles, and octagonal cloakrooms are situate at the north and south ends. The schools have accommodation for 274 children, together with a board-room. The large room contains accommodation for 150, and on removal of a glass partition is enlarged to 22ft. by 58ft., with three entrances. The babies' room contains accommodation for 54 infants, and the boys' classroom for 60. The architect for the schools is Mr. J. W. Start, F.S.I., of Colchester and Harwich, and the contractor Mr. E. West, of Chelmsford.

**LINCOLN.**—The improvements on the Carholme racecourse have now been completed. The improvements effected are to the east of the grand stand on the south side of the racecourse. The old wooden stands have been replaced by a brick structure, with iron stanchions, steel girders, and a roof of corrugated iron. The stand will accommodate 2,500 persons. At the east end of the stand, entrance is gained to a refreshment bar, 56ft. by 38ft., containing 150ft. of counter space, with a luncheon-room 16ft. by 38ft. A kitchen serves the luncheon-room on the one side and a dining-room, 38ft. by 26ft. on the other. Cellarage has been provided, 92ft. long and 7ft. wide. Behind the stand at the east end are the police-office cells. A new saddling paddock, with brick and tiled shed, has been constructed. The architects of the new stand were Messrs. W.

Mortimer and Son, Lincoln; and the builders were Messrs. Wright and Son, Lincoln, the contract price being over £3,000.

**RUSTINGTON.**—A convalescent home for working-men at Rustington, near Littlehampton, built at a cost of over £70,000, solely borne by Mr. Henry Haslem, was opened on Saturday by the Bishop of Chichester. The home is planned chiefly upon the separate principle, in small rooms, and the internal woodwork is mainly of hard-woods requiring no paint, so as to reduce the cost of maintenance to a minimum. The building is Georgian in style, and stands in grounds of over nine acres. It is set back 250ft. from the esplanade, and has a frontage of over 170ft. The buildings have been erected by Messrs. Holland and Hannen, of Hyde-street, Bloomsbury, from the designs and under the superintendence of Mr. Frederick Wheeler, F.R.I.B.A., of Chancery-lane, W.C., and 4, Carfax, Horsham; the electric lighting is by Messrs. Drake and Gorham, from the designs and under the superintendence of Mr. W. H. Preece, C.B.

**TRURO.**—The scheme for the erection of the Central Technical Schools for Cornwall by the side of the free library is now matured, and is a much bigger undertaking than was originally contemplated. A range of buildings is to be erected opposite the Royal Institution of Cornwall from plans prepared by Mr. Silvanus Trevail, F.R.I.B.A., of Truro. The block will be about a third larger than the initial designs, in order to meet the requirements of the county and the Science and Art Department. The sanction of the Local Government Board has been received by the Truro Corporation to borrow £690 for the purchase of the site for the schools, and at the next meeting a formal resolution to do so will be proposed. The plans are settled in all respects between South Kensington Science and Art authorities and the architect in regard to the general arrangements. If erected accordingly, they have promised to put the building in the category for obtaining maximum maintenance grants by examination results. They approve of the special accommodation afforded for county purposes. The executive committee, representing the County Council, Truro Council, and citizens, have given instructions to advertise for tenders, which will be open. In consequence of the enlargement of the plans the free library will have to be heightened; otherwise it would be quite dwarfed by the schools. For this the formal consent of the City Council will be necessary. The proposed increase in the height of the free library would provide quarters for the librarian—a valuable desideratum. The new building will be vested in six trustees, whose duty it will be to insure the using of the premises for the purposes to which it is dedicated—one of whom will be Mr. Trevail, as the chairman of the Central Technical Schools.

The Court of Appeal heard, on Thursday and Friday in last week, the defendants' appeal in the case *Peebles v. The Oswaldtwistle Urban District Council*. This was the case in which the question was whether the council were obliged to admit the factory liquids into sewers. Mr. Justice Charles found that they were, and it was against this judgment that the defendants appealed. The Court dismissed the appeal with costs.

The parish church of Swinton, South Yorkshire, having taken fire owing to defective heating apparatus, was burnt down on Wednesday. In about half an hour the roof fell in, and the old-fashioned high-backed seats and gallery were consumed. The Mexborough and Rotherham fire brigades assisted the local brigade, but only the tower was saved. The parish documents were preserved by the curate. The damage is estimated at about £3,000, and the church was insured for £2,000.

An interesting discovery has just been made at Hartshill, on the great Roman-road running from London to Chester. Since 1773 there have been numerous discoveries indicative of the Roman occupation. About four years ago a Roman kiln was discovered, but the work was too much destroyed to be of value or allow of a systematic examination. Last week, however, on the other side of the roadway, at the Caldecote Quarries, a second kiln was found, and in the uncovering very little damage was done. A third kiln, in a good state of preservation, was afterwards unearthed. A quantity of pottery remains have been found, chiefly of the dark-blue slate colour, including a perfect cinerary urn, about 5in. high. The kilns, which were discovered about 16in. below the turf, are oval in form, and about 43in. by 60in.

## COMPETITIONS.

**ABERDEEN.**—The Lighting Committee of Aberdeen Town Council deliberated on Friday on nine designs for the erection of the proposed new fire-brigade station in King-street. Four plans were selected. The first premium of £50 was awarded to Mr. Mackinnon, architect, Union-street, Aberdeen, who estimated the cost of the buildings at £10,400.

**KIEV.**—The results of the International competition for designs for a theatre at Kiev are now to hand. The awards have been made as follows:—First premium (2,500 roubles, about £250), to Professor Victor Schröter, St. Petersburg; second (1,500 roubles, about £150), to M. Heinrich Seeling, Berlin; third (1,000 roubles, about £100), to M. Carlo Sada, Milan; fourth (700 roubles, about £70), to M. Axel Anderberg, Stockholm; fifth (300 roubles, about £30), to M. Georg Weber, Moscow. England was not represented. The eighteen architects who competed included nine Russians, three Frenchmen, three Germans, one Swiss, one Swede, and one Italian.

## CHIPS.

A sum of £20,000 is about to be spent on lengthening the pier at Southend, which is already a mile and a quarter long.

New schools are about to be built for 436 children, in connection with St. Paul's Church, Lorrimer-square, Walworth, at an estimated cost of £3,250. Mr. Philip A. Robson is the architect.

The Senate of the University of Glasgow have resolved to confer on the 13th prox. the honorary degree of LL.D. on Mr. John Wolfe Barry, C.B., F.R.S., president of the Institution of Civil Engineers, London.

The property known as Dagnall Park Estate, adjoining Selhurst Station, has recently been disposed of. The purchaser has retained Messrs. Percy Palgrave and Co., 12, Victoria-street, S.W., as the architects and surveyors for the extensive developments to be commenced immediately.

The Ven. Archdeacon Scott dedicated on Thursday a stained-glass window, which had been placed in the east end of Wigginton church. The window shows three subjects: "The Crucifixion" (centre), "The Birth," and "Baptism." The work has been executed by Messrs. Camm and Co., Smethwick.

At Exeter, on April 5, 191ft. run of the old city walls will be sold by auction, in connection with adjacent property. The city is still surrounded by about a third of its old wall.

Mr. Wm. Shepherd has been appointed President of the Central Association of Master Builders of London for the ensuing year, Mr. B. I. Greenwood and Mr. Thos. Gregory vice-presidents, and Mr. Chas. Wall treasurer.

On April 10 Mrs. Humphrey Ward is to lay the foundation-stone of the Charles Lamb and John Keats Public Library, which Mr. J. Passmore Edwards is building at Lower Edmonton, from the designs of Mr. Maurice B. Adams, F.R.I.B.A., for the district council of Edmonton.

The commissioners for libraries at St. George's-in-the-East, on Monday last, unanimously approved of the designs and plans for the new public library which is about to be erected in Cable-street, St. George's, by Mr. J. Passmore Edwards, as his gift to the parish, in association with the Diamond Jubilee commemoration. The architect is Mr. Maurice B. Adams, F.R.I.B.A. The chief feature of this particular library will comprise a big reading-room 46ft. square, and roofed by a steel constructed domed ceiling surmounted by a lofty lantern. Upstairs a reference-room, about 48ft. by 24ft., will extend along the frontage. The site adjoins the vestry-hall, and flanks Prospect-place. The façade will be marked by three gables grouping with the chimneys, and three big oriel windows, and a central porch with sculpture.

The visiting committee of the City of London Lunatic Asylum, situated at Dartford, in Kent, have submitted to the Corporation of London plans for improvements in the asylum necessitated by the requirements of the Commissioners of Lunacy. The asylum was opened in 1866, having then cost £68,105. A female wing for 70 additional patients was provided in 1874 at a cost £9,000, and a male wing for 35 extra patients, in 1885, at an expense of £5,100. In 1878 a detached cottage hospital was built at a cost of £5,100. The committee recommended certain improvements at a cost of £46,770, of which £16,225 was for a new laundry, £16,300 for infirmaries, £3,075 for baths, and £3,700 for a new chapel and recreation-room. It was not intended to proceed with the whole of the works at once, but to distribute the expenditure over a period of three to five years.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 392, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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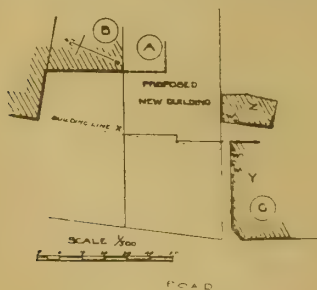
Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—H. J. G.—S. P. S.—W. Z. (Harwich).—L. T. C.—R. B. W. and Co.—H. F. H.

## Intercommunication.

## QUESTIONS.

[11639].—**Ancient Lights.**—My client A is pulling down an old building, at present in line with B, and coming forward to the building line X, which is in line



with other buildings to the north. C has ancient lights, as shown by the letters W. A's proposed building is to be 30ft. high to the eaves, and has a gable to the south. C's buildings are two low stories in height. I should be grateful if any competent reader could give me an opinion as to the following, and also refer me to any simple book on the subject of ancient lights. (1) Should I make an infringement on C's light in Block 2 by coming forward? (2) Should I also do so on C's light in Block Y?—A. A. G.

[11640].—**Jelly Room Floor.**—Can any correspondent name a floor suitable for jelly room of a confectionery work, or give experience as to such? Floor must be watertight, no joints, else jelly would fill these and sour. Floor must stand acid action of fruit. Floor must stand heat of jars filled with boiling jelly and piled up, and not soften to mark at all.—LANARKSHIRE.

[11641].—**Damp Walls.**—Will any of your correspondents kindly inform me of a cure for damp walls in basement? The room, the walls of which are particularly damp, is intended to be used as a strong-room, is already

well ventilated, and the adjacent soil is apparently perfectly dry. STROUD-ROOM.

[11642].—**Paint for Tank.**—Could any reader tell me what kind of paint or material I can cover the cement bottom of a warm-water tank with to make it as white as possible?—something that will not rub off and discolour the water.—WATER PORT.

## CHIPS.

New board schools for boys are being built in Blechley-road, Fenny Stratford. Mr. J. Chadwick is the architect, and Messrs. Slaymaker and Harlow are the builders.

A new hotel, to be known as the Headland, is about to be built at Newquay, from designs by Mr. Silvanus Trevail, of Truro. It will be Renaissance in style, and will occupy a site of five acres.

Mr. Thomas Alexis Dash, late land surveyor to H.M. Office of Works, Whitehall-place, S.W., died on Saturday at his residence, Woodham, Addlestone, aged 69 years.

An appeal is being made for subscriptions for the purchase of a selection from Lord Leighton's sketches, which it is proposed shall be hung on the walls of his house, offered to the nation by his sisters under certain conditions. Towards the £1,150 asked for the drawings, between £400 and £500 has been promised.

Cardinal Vaughan on Saturday laid the foundation-stone of a home for factory and working girls, to be conducted by the Sisters of Marie Auxiliatrice, whose present premises at 24, Bow-road are insufficient for their extending work. The new home will adjoin the existing one, and will cost £6,000.

At a sitting of the Consistory Court of St. Alban's, held on February 19 last, application was made for the grant of a faculty in respect of certain figures which it was desired to erect on the chancel screen of Holy Trinity Church, Great Bardfield, Essex. The application was unopposed; but, owing to the importance of the question raised by it, the Chancellor, Mr. A. B. Kempe, took time to consider his decision, which was pronounced at a Court held on Thursday, March 18. Mr. Kempe made a decree that a faculty be granted for the erection on the three pedestals on the screen of the three stone figures, without gilding or painting.

The Rustington Convalescent Home for Working Men was opened on Saturday by the Bishop of Chichester. The home has been erected by Mr. Henry Harben, of Hampstead, at a cost exceeding £50,000, and Mr. Harben has also provided an endowment of £20,000. The home is based chiefly on the separate system; there are 17 rooms with one bed, ten with two beds, and two with four beds. It is lighted with electricity, stands in grounds of over nine acres, is set back 250ft. from the esplanade, and has a frontage of over 170ft. It is in the Georgian style, the architect being Mr. Frederick Wheeler, F.R.I.B.A., 22, Chancery-lane, W.C.

A syndicate has been formed to erect a new theatre at Tunbridge Wells. Mr. John P. Briggs, of Effingham House, Arundel-street, has received the appointment as architect.

The partnership heretofore subsisting between H. Clere and H. T. Buckland, architects and surveyors, Birmingham, under the style of Clere and Buckland, has been dissolved.

The parish church of St. Mary, Gosforth, Cumberland, is being restored at a cost of over £2,000. The galleries have been removed, and the nave is being almost entirely rebuilt. The chancel and vestry need rebuilding as well, but the nave is to be finished first. About £1,800 has already been raised.

The town council of Welshpool have definitely approved of plans for new intermediate schools, prepared by Mr. F. H. Shayler.

A stained-glass seven-light window is being placed in the east end of the chancel of St. Giles's parish church, Newcastle-under-Lyme. The subject of the design is the Crucifixion. Messrs. Hardman and Co., of Birmingham, have the work in hand.

The Bishop of Stepney will attend at St. Anne's Church, Stamford Hill, on Saturday afternoon, April 10th, to dedicate the new choir vestry, which has been erected by the congregation as a memorial to the late munificent patron of the church, Mrs. Robins. The vestry is built in same style as church, and faced with Kentish rag and Bath stone dressings. At the same time numerous repairs, painting, &c., have been done to the church. Mr. A. Porter, of Tottenham, has carried out the work, under the direction of Mr. Spencer W. Grant, A.R.I.B.A., of 63, Finsbury-pavement, who has acted as honorary architect.

A stained-glass window was unveiled at the parish church of St. Bartholomew, Benton, on Sunday. It is the work of Messrs. Wailes and Strang, artists in stained glass, of Newcastle-on-Tyne.

## WATER SUPPLY AND SANITARY MATTERS.

**SKELTON AND BROTTON.**—At a meeting of the Skelton and Brotton Urban District Council, held on Friday, it was reported by the engineer that the scheme of main sewerage and sewage disposal had been satisfactorily completed by the contractor, Mr. J. Carrick, of Durham, within the time allowed by the County-court order. About twelve months ago an injunction was obtained from the court by the Saltburn Urban District Council to prevent the pollution of the Skelton Beck, which flows through the pleasure-gardens at Saltburn. After a public inquiry of the Local Government Board by the late Mr. W. J. B. Clerke, M.Inst.C.E., whose sanction to a loan of £15,000 was obtained, a start was made with the work, which is now fully completed. The scheme is from the design of Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, and comprises about ten miles of 21, 18, 15, 12, and 9in. fireclay and cast-iron pipe sewers, with manhole and lampole shafts, automatic flushing chambers, cast-iron valley crossings, &c. The fireclay pipe-joints are made partly with Hassall's patent water-tight joint, and partly with gaskin and cement. The work consists of a combined intercepting scheme for carrying the whole of the sewage from the ten villages in the district, which have a population of 10,000, to a point at the top of the cliffs on the coast at Cranedale Spout, where the cliffs, 200ft. in height, have had a tunnel driven with a gradient of 1 in 2 from the beach to the top of same, and lined with bricks, in which are laid cast-iron pipes, connected by easy bends to the outfall sewer on beach, which is carried 700 yards out to sea. This sewer is of cast iron laid in a trench in the rock on the beach and embedded in concrete, cast-iron inspection chambers being placed on the outfall, and indicated by means of cast-iron posts. A large number of float experiments were made to ascertain the proper point of discharge, so that there could be no nuisance from reflux sludge, and ultimately a point to the north-west of Huntcliffe promontory, 700 yards from the cliff, was decided on, being at extreme low water, and where it is found the sewage at all states of the tide was carried out to sea. The work is on the most modern principles in all details, and has been completed for less than the engineer's original estimate.

**THE TALLA WATERWORKS FOR EDINBURGH.**—The members of the Edinburgh and District Waterworks on Saturday paid a visit of inspection to the Talla waterworks, or, rather, to that portion of them—the service railway from Broughton to Tweedsmuir—which is now approaching completion. The line is being constructed by Messrs. James Young and Sons, contractors. The Talla reservoir, for the construction of which tenders have just been invited, will be the largest and deepest that the trustees have under their charge. Covering about 300 acres of land, it will have a capacity of 2,750 million gallons. The trench for the embankment has already been opened in order to show contractors the quality and depth of the rock. The average depth is about 30ft., but provision has been made in the specifications and tenders for going down another 10ft., or, indeed, to whatever further depth is necessary to obtain solid rock. The clay necessary to the construction of the puddle trench will be brought from Carlisle. The catchment area of the present scheme is 6,180 acres, and the estimated available rainfall is 32in. On the basis of 32in., the quantity of water from the Talla catchment area alone is estimated at 12 million gallons per day on the average, eight million of which are to be brought into the city of Edinburgh, and four million given for compensation. The cost of the first instalment of the present scheme is estimated at £623,000, while another two million gallons per day, it is calculated, might be obtained from the Menzion, an adjoining stream, at an additional cost of £15,000. The tunnels and aqueducts are being constructed for a capacity of about 35 million gallons per day, and the first line of pipes will carry 10 million gallons per day, leaving additional pipes to be laid from time to time as required.

The death, at the age of 59 years, of Mr. Robert Gelson, builder and contractor, Alnwick, took place on Thursday night in last week. The deceased was well known in Alnwick and the district. He was connected with the 2nd Northumberland (Percy) Artillery Volunteers for over thirty years. He was a trustee of the Alnwick Working Men's Club, a Mark Master Mason, and a member of the Alnwick Lodge of Freemasons.

A new baptistery has been formed in the tower of Holy Trinity Church, Hoxton, and the font removed and re-erected therein. The steps have been removed, and the tower ceiled with oak boards and ribs at a height of about 16ft., and a new two-light window inserted in south wall, while the doorway from church has been enlarged and converted into a large arch. The architect was Mr. Spencer W. Grant, and the builder Mr. J. Ivory, of Great Cambridge-street, E.



## PARLIAMENTARY NOTES.

**GOVERNMENT CONTRACTS AND FAIR WAGES.**—Before the Select Committee on Government Contracts (Fair Wages Resolution), which sat on Friday at the House of Commons, under the presidency of the Home Secretary, evidence was given by Mr. E. Caleb Gibbs, general secretary of the Amalgamated Society of House Decorators and Painters. Witness submitted details of complaints which had been received from trade branches in Leicester, Norwich, and Plymouth of cases in which the Fair Wages Resolution had been infringed in connection with War Office contracts. In regard to the complaint from Plymouth, Mr. Powell Williams inquired whether witness was aware that a different rate of wages obtained at Devonport to that at Plymouth, and that the contractor was paying the Devonport rate to his men. Witness replied that that was so, but he claimed that the rate of wages should be that which obtained in the locality in which the work was done. Mr. Powell Williams: It is clear from your statement that there is not a uniform rate of wages. Witness: I believe there is  $\frac{1}{4}$ d. per hour difference between Plymouth and Devonport. In the course of further evidence witness said the rate of wages at Plymouth was fixed at a minimum of  $\frac{1}{4}$ d. per hour by a majority of the employers and men in 1893, and he considered that the War Office should be made to pay the rate of wages which had thus been fixed. Devonport and Plymouth were practically joined, though the difference of  $\frac{1}{4}$ d. per hour prevailed. By Mr. Sydney Buxton: If a Devonport firm were to take to a Plymouth job men who were not regularly in their employ, and then simply pay them  $\frac{1}{4}$ d. an hour, the trade society would, of course, object.

## CHIPS.

The Carpenters' Company, at their last Court meeting, appointed Mr. Harry Westbury Preston, of 14, Abchurch-lane, as solicitor to the Company.

The committee of the Salisbury and South Wilts Museum have adopted a plan for the addition of buildings for the free library at the museum, which it is estimated will cost £1,000.

The Devon and Cornwall Banking Company have accepted the tender of Mr. Ambrose Andrews, of Plymouth, for the erection of new banking premises in Church-street, Falmouth, the designs of which were prepared by Mr. Silvanus Trevail, F.R.I.B.A., Truro. The building will face the post-office and Polytechnic Hall, and will be in Plymouth limestone, with Ham Hill stone and granite dressings.

The Secretary of State for the Colonies has appointed Col. Arthur Clifford Alexander, R.C., to be Colonial Engineer and Surveyor-General of the Straits Settlements, in the place of Major MacCallum, C.M.G., who has been promoted to be Governor of Lagos. Mr. Chamberlain has also appointed Mr. F. H. Grinlinton to be Surveyor-General of Ceylon, in the room of Mr. D. G. Mantell, retired.

The Herts County Council considered, on Friday, a report as to the salary of their county surveyor, Mr. Urban Armstrong Smith, who has held that appointment since 1876, and previously acted as deputy surveyor for five years. It was decided to pay in future an inclusive salary of £1,100 per annum. Out of this salary the county surveyor will have to provide offices and pay his clerical staff, draughtsmen, travelling expenses, and other disbursements, which it is anticipated will amount to at least £550 per annum, so that the amount of the net salary to be received by Mr. Urban Smith for his own services will be at the rate of £550 per annum.

The will of Mr. Alexander Milne Dunlop, of 11, Norfolk-street, Park-lane, vice-president of the Surveyors' Institution, and a surveyor to the Board of Trade and the Charity Commissioners, who died on January 4, has been proved, the value of the personal estate amounting to £14,253 18s. 6d.

The Wimborne Estate at Sully, comprising about 1,200 acres of land situate between the new docks at Barry and the sea-coast, and thence extending from the Hayes Farm as far as Sully Island, is about to be developed for building purposes. The land will be laid out gradually, under the management of Mr. H. Kay, of the Wimborne Estate Office, Pontyclun, and Messrs. Veall and Sant, of Cardiff, have been appointed architects to the estate.

The subscription portrait of Mr. F. C. Penrose, F.R.S., proposed to be hung on the walls of the Royal Institute of British Architects, will be painted by Mr. J. S. Sargent, R.A. elect.

Colonel J. O. Hasted, R.E., from the Local Government Board, held an inquiry, on Friday, at Wolverhampton, with respect to the application of the town council for power to borrow £6,001 for works of street improvement and £1,555 for the extension of the electric-lighting system. Messrs. Bradley (borough surveyor) and Lewis (electrical engineer) gave evidence in support of the scheme.

## Our Office Table.

THE Duke of Devonshire, Lord Herschell, Sir W. H. Broadbent, Sir J. Crichton Browne, and Mr. C. S. Loch have issued an appeal on behalf of the colony established at Chalfont St. Peter by the National Society for the Employment of Epileptics. Besides the two homes at present in occupation at the colony, two others, the funds for which have been specially given, are in course of erection—one for men and one for women—and additional funds have been offered by generous friends, and notably by Mr. J. Passmore Edwards, for the erection of several other homes, two of which will be commenced shortly from the designs of Mr. Maurice B. Adams, the architect of the men's home. Within a year there will, therefore, it is hoped, be accommodation at the colony for about 160 epileptics, men, women, and children. Even then the provision will be small in comparison with the need; but, while the funds for building the new homes are provided, these great extensions will involve considerable incidental outlay, for which as yet little provision has been made. A laundry (now building) will be needed for the female colonists, and school accommodation for the children. The sewage system will need extension, and a house must be provided for the resident medical officers. The additional outlay for absolutely necessary purposes is estimated at £10,000, and contributions are asked towards this object.

IN Devonshire, the gale on the morning of the 3rd inst., in the short space of half an hour, blew down something like 10,000 large elm trees, more or less, but probably much more than less that number. This has caused such a glut upon the local market that elm can be had anywhere almost for the asking. At Chudleigh, for instance, on the 18th inst., at an auction, some superb old elms felled by the wind only fetched 1d. a ton! It was at Chudleigh principally that the oak used for the construction of the bishop's throne in Exeter Cathedral, admittedly the grandest thing of its kind in the world, was grown in A.D. 1312. This throne was designed by Bishop Stapeldon (A.D. 1308-1326). The fabric-rolls of the cathedral record that the timber cost £6 12s. 8 $\frac{1}{4}$ d., equal, probably, to £60 0s. 8d. in purchasing power nowadays. The stuff was kept for seasoning four years, and then this most glorious example of 14th-century joinery and carved work was undertaken by Robert de Galmeton, who made it, *ad tascum*—i.e., by task-work (contract).

A SMALL exhibition is being held this week at the Central School of Arts and Crafts, 316, Regent-street, where there are placed on view selected examples of the work submitted by candidates for art scholarships and exhibitions offered by the Technical Board of the London County Council. The scholarships to be awarded exceed £3,000 in value, and are intended mainly to enable young artisans and apprentices who are earning, or intend to earn, their living by working in artistic crafts to pursue their art studies with special reference to the work on which they are engaged. The exhibition comprises, besides drawings and designs, specimens of craftsmanship, such as plaster work, sgraffito work, gesso work, metal work, woodcarving, bookbinding, furniture, embroidery, stained glass, and other work. The exhibition, which has been arranged by Mr. George Frampton, A.R.A., and Mr. W. R. Lethaby, will be opened to-day and to-morrow (Saturday), between the hours of 2 p.m. and 10 p.m. Visitors are admitted upon signing their names in the visitors' book at the Central School of Arts and Crafts, 316, Regent-street.

MR. DAVID JAMES ROSS, M.Inst.C.E., engineer to the City Commissioners of Sewers, states in his annual report that the total length of sewers constructed during 1896 was 351ft., of which 101ft. were upon the lines of old sewers. A number of street improvements were carried out in Aldgate, Basinghall-street, Fetter-lane, the Bishopgate-street entrance to Great St. Helens, the corner of Godliman-street and Carter-lane, Houndsditch, and Upper Thames-street. The widening operations at the east end of Fleet-street are also referred to. As showing the importance of widening Cheapside on the south side of the General Post Office, West, fronting Newgate-street, it is stated that on June 19, 1896, 16,560 vehicles passed this point between 8 a.m. and 8 p.m., the width available being only 27ft. 7in. from kerb to kerb. With regard

to subways, it is stated that beneath the City streets, and under the control of the Commission, there exist at the present time about 2,360 yards, or nearly one mile and a half, of subways. The lengths of gas, water, and hydraulic mains, and telegraphic, telephone, pneumatic tubes, and electric-lighting conduits laid in these subways amount to a total of seven miles and a half. Access under proper supervision is given to the officers and workmen of the various companies, 4,717 workmen and others being admitted during the year for various purposes. The usefulness of these subways is evidenced by the fact that in the streets beneath which they have been constructed no openings have been made for access to pipes, &c., except those for taking pipes into the ends of the subways, since they were constructed.

UNDER ordinary methods of church illumination, about 25 per cent. only of the light benefits the congregation, the remaining 75 per cent. being lavished on the ceiling and upper parts of the building. The "Stott-Thorp" lights reverse this order, and give the congregation 75 per cent. and 25 per cent. to the ceiling. By this system, therefore, more efficient illumination, combined with perfect ventilation, is secured at a small first outlay, and with a consumption of gas only two-thirds of that usually pertaining. The season for redecorating, renovating, or cleansing of places of worship is now approaching, and affords opportunities for the improvement of the lighting arrangements, since such work may be coincident with the general renovation operations at a proportionally reduced cost. In our opinion, all interested would do well to adopt the "Stott-Thorp" lights, which are supplied by Messrs. James Stott and Co., of 174, Fleet-street, E.C.

## ADAMANT STONE AND PAVING COMPANY, LTD.

## FIVE POUNDS REWARD.

The Action brought by this Company against the Liverpool Corporation for infringement of their Patent was upheld by Mr. Justice Romer, whose decision was appealed against, and after three days' hearing in the Appeal Court, was withdrawn by the Liverpool Corporation.

The Company are aware that in Bootle and Pannemaunw the Patent has been infringed; but having reason to believe that in other parts of the country their process for Manufacturing Artificial Stone by Pressure has been used, the Company will pay the above amount for such information as will enable them to take the necessary steps to protect their interests.

The Company are prepared to grant Licenses on favourable terms. 142 and 143, Palmerston Buildings, Old Broad-street, London, E.C.

## MEETINGS FOR THE ENSUING WEEK.

- SATURDAY (To-morrow).**—Building Trades Exhibition, Agricultural Hall. Distribution of Prizes to successful competitors in handicrafts, by Sir Arthur Arnold. 5 p.m.  
London and Provincial Builders' Foremen's Association, Memorial Hall, Farringdon-road, E.C. "Technical Education," by F. Chessell. 8 p.m.  
**MONDAY.**—Royal Institute of British Architects. "Heraldry of the Elizabethan Period," by J. Alfred Gutch, F.S.A. 8 p.m.  
Society of Arts. "Alloys," Cantor Lecture No. 3, by Prof. W. C. Roberts-Austen, C.B. F.R.S. 8 p.m.  
**TUESDAY.**—Institution of Civil Engineers. "Electric Lifts and Cranes," by Henry W. Ravenshaw, Assoc.M.Inst.C.E. 8 p.m.  
Society of Arts. "Lead Work," by W. R. Lethaby. 8 p.m.  
Auctioneers' Institute. "Incidence of Rates on Landed Property," by E. J. Harper, F.A.I. 8 p.m.  
**WEDNESDAY.**—Society of Arts. "Cycling: Historical and Practical," by George Lacy Hillier. 8 p.m.  
**THURSDAY.**—Society of Arts. "A Visit to Russian Central Asia," by Michael F. O'Dwyer, F.C.S. 4.30 p.m.  
**FRIDAY.**—Architectural Association. "Architecture in Relation to the Crafts," by T. G. Jackson, R.A. 7.30 p.m.

On Wednesday week the foundation-stones were laid of a new Wesleyan chapel and schools for Alrewas. The contract has been let to Mr. Richard Kershaw, of Burton-on-Trent, for £1,023. The church will seat 300 and the new schools will accommodate 250. The building is to be in the Early English style, of red brick, with stone dressings, and cruciform in shape. The architect is Mr. Gunton, of the firm of Messrs. Gordon, Lowther, and Gunton, London.

At the Manchester Police-court, on the 18th inst., George Ezard, who had carried on business in partnership with one Hodgkinson as a joiner and builder in Ashton New-road, Clayton, was charged with concealing part of his property; with not disclosing the whole of his separate estate; and with making material omissions in his statement of affairs and public examination. Ezard had nothing to say in reply to the charge, and was committed to the sessions for trial, bail being allowed.



## Trade News.

### WAGES MOVEMENTS.

PERTH.—The master painters have granted the men the advance of a halfpenny an hour asked for, making the rate of wages 7½d. per hour as from May 1st.

WAGES AND HOURS OF LABOUR.—The third annual report of the Labour Department of the Board of Trade on changes in wages and hours of labour in the United Kingdom shows, in regard to wages, that the number of changes in each year from 1893 to 1896 has steadily increased, largely, no doubt, owing to the improvement in the means of collecting the information. On the other hand, the aggregate number of workpeople affected has continuously diminished from nearly a million and a half in 1893 to under a million in 1896. The effect of the changes of 1894 was a net fall of £45,091 in weekly wages. In 1895 there was a fall of £23,211, while for 1896 the preliminary figures show a net rise of about £25,000. The number of individuals affected by changes in hours of labour rose from 34,649 in 1893 to 77,158 in 1894, when the eight-hour day was introduced into many Government establishments. In 1895 the number sank to 22,735, but the figures for 1896 show a rise to 111,500. The preliminary figures for 1896, dealt with in a separate section of the report, show that during the year 1,370 changes in wages were reported, 1,255 being increases and 115 decreases. The net effect on the weekly wages of 601,200 individuals whose wages were changed was an average increase estimated at 10d. per head. There was a net rise in wages during 1896 in every group of industries except mining and quarrying. The changes in hours of labour reported in 1896 affected a larger number of workpeople than in either of the three preceding years, but the average amount of change was only small. The bulk of those affected were, as in 1895, in the building trades, this group accounting for nearly 88,000 of the total number. The changes of hours in the building trades were in nearly every case accompanied by increases in the hourly rates of wages. The net effect of all the changes was a reduction of 78,360 working hours per week, or nearly three-quarters of an hour per head of all those whose hours were reported as changed during the year.

### CHIPS.

The negotiations between Lord Penrhyn and his Carnarvonshire quarrymen have broken down on the questions of combination and employment of non-unionist labour. The quarries will now be closed indefinitely. They have already been stopped for six months.

Sheriff Lees, the arbiter, has issued his award in the limited reference as to the price of the Stirling Gasworks. The valuation for the Corporation of Stirling was £61,130, and for the Gaslight Company £68,320. The amount of the award is £62,697 10s. 11d.

The Devonshire County Council, at their quarterly meeting, decided to appoint two road surveyors, instead of the four surveyors as at present, who should give their whole time to the duties of their office, and that each surveyor should have a salary at the rate of £400 a year, and that he be allowed travelling expenses, at not exceeding the rate of £150 a year. The existing appointments with surveyors will terminate in July next.

The Congregational Chapel at Stafford was reopened on Wednesday, after improvement at a cost of about £1,900. The chapel has been lengthened 15ft. A new front has been erected in brickwork, with stone dressings and enrichments. The massive stone portico, which for many years formed the entrance to the old infirmary at Stafford, was purchased from the committee of that institution, and has been adapted to the new front of the chapel. The interior has been almost reconstructed. A new rostrum and platform have been erected, the organ has been brought from the gallery to the ground floor, the galleries are entirely new, as are also the windows, which are filled with leaded lights of tinted glass. The building is lighted by the electric light, which has been installed by Messrs. Lea, Son, and Co., of Shrewsbury. The architects were Messrs. Ingall and Son, of Birmingham, and the builder was Mr. J. Biggs, of the same city. The organ has been enlarged and re-erected by the original builder, Mr. Banfield, Birmingham.

An inquiry was conducted by Colonel J. O. Hasted, R.E., an inspector of the Local Government Board, at the Market Hall Chambers, Ashby-de-la-Zouch, on Tuesday week, concerning an application by the Ashby-de-la-Zouch Urban District Council for leave to borrow £15,117 for works of sewerage, and for power to acquire glebe land, situated between Packington and Measham, for the same purpose. Mr. J. B. Everard, the engineer, and Mr. G. H. Lilly, manager to the urban district council, gave evidence in support of the scheme.

## LATEST PRICES.

### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian .....	£5 12 6 to	£5 0 0
Rolled-Steel Joists, English .....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates .....	5 15 0 "	7 10 0
Bar Iron, good Staffs .....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square .....	17 0 0 "	17 10 0
Do., Welsh .....	5 15 0 "	5 17 6
Boiler Plates, Iron —		
South Staffs .....	7 17 6 "	8 5 0
Best Sneydhill .....	10 0 0 "	10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 10s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron —		

	No. 18 to 20.	No. 22 to 24.
8ft. to 8ft. long, inclusive gauge .....	Per ton. £10 15 0	Per ton. £11 0 0
Best ditto .....	11 5 0	11 10 0

	Per ton.	Per ton.
Cast-Iron Columns .....	£8 0 0 to	£8 10 0
Cast-Iron Stanchions .....	6 0 0 "	8 10 0
Cast-Iron Sash Weights .....	—	4 2 6

	Per ton.	Per ton.
Cast-Iron Socket Pipes —		
3in. diameter .....	5 10 0	5 15 0
4in. to 6in. .....	5 5 0	5 10 0
7in. to 24in. (all sizes) .....	4 15 0	5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

	Per ton.	Per ton.
Pig Iron —		
Cold Blast, Lilleshall .....	105s. to	110s.
Hot Blast, ditto .....	57s. 6d. to	62s. 6d.

	Per ton.	Per ton.
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes .....	75p.c. Fittings 77½p.c.	
Water-Tubes .....	70	72½
Steam-Tubes .....	62½	65
Galvanised Gas-Tubes .....	60	62½
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	10cwt. casks.	5cwt. casks.
Sheet Zinc, for roofing and working up .....	£23 0 0 to	£24 0 0
Sheet Lead, 3lb. per sq. ft. super. .....	13 5 0 "	14 17 6

	Per ton.	Per ton.
Pig Lead, in 1cwt. pigs .....	13 0 0 "	14 15 0
Lead Shot, in 25lb. bags .....	16 0 0 "	17 0 0
Copper Sheets, sheathing and rods .....	63 0 0 "	64 0 0
Copper, British Cake and Ingot .....	53 0 0 "	53 10 0
Tin, Straits .....	60 5 0 "	60 15 0
Do., English Ingots .....	64 10 0 "	65 0 0
Spelter, Silesian .....	17 15 0 "	18 5 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in. ....	£9 15 0	9 15 0
Cut Floor Brads .....	8 10 0 "	9 10 0

	Per ton.	Per ton.
Wire Nails (Points de Paris) .....		
0 to 7 8 9 10 11 12 13 14 15 B.V.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/3		per cwt.

### TIMBER.

	per load	£13 5 0 to	£16 10 0
Teak, Burmah .....	11 10 0 "	15 0 0	
Bangkok .....	11 10 0 "	15 0 0	
Quebec pine, pitch .....	2 0 0 "	4 0 0	
yellow .....	5 0 0 "	6 0 0	
Oak .....	3 10 0 "	5 5 0	
Birch .....	3 15 0 "	5 0 0	
Elm .....	3 0 0 "	4 5 0	
Ash .....	2 10 0 "	3 10 0	
Dantisc and Memel Oak .....	2 15 0 "	4 15 0	
Fir .....	2 5 0 "	4 10 0	
Wainscot, Riga p. log .....	4 10 0 "	5 10 0	
Lath, Dantisc, p.f. .....	5 0 0 "	6 10 0	
St. Petersburg .....	8 0 0 "	9 0 0	
Greenheart .....	£1 1 9 to	£2 0 0	

	per cube foot	per super foot
Sequoia, U.S.A. ....	0 0 4½	0 0 6
Mahogany, Cuba, per super foot	0 0 5	0 0 6½

	per cube foot	per super foot
lin. thick .....	0 0 4½	0 0 5
Honduras .....	0 0 4½	0 0 5
Mexican .....	0 0 4½	0 0 5
Cedar, Cuba .....	0 0 4½	0 0 5
Honduras .....	0 0 4½	0 0 5
Satinwood .....	0 0 7	0 1 0
Walnut, Italian .....	0 0 3½	0 0 7

	per 11in. —	per 12ft. by 13in.
Quebec, Pine, 1st .....	£20 0 0 to	£23 0 0
2nd .....	14 10 0 "	16 10 0
3rd .....	7 0 0 "	10 10 0
Canada Spruce, 1st .....	9 10 0 "	11 0 0
2nd and 3rd .....	7 15 0 "	9 0 0
New Brunswick .....	7 10 0 "	8 5 0
Riga .....	7 10 0 "	8 10 0
St. Petersburg .....	9 10 0 "	13 10 0
Swedish .....	9 0 0 "	16 10 0
Finland .....	9 0 0 "	9 10 0
White Sea .....	10 10 0 "	17 0 0
Battens, all sorts .....	5 0 0 "	20 0 0
Flooring Boards, per square of 1in. —		
1st prepared .....	0 9 0 "	0 16 0
2nd ditto .....	0 7 6 "	0 12 6
Other qualities .....	0 5 9 "	0 7 0

	per standard M. —	per standard M. —
Quebec pipe .....	35 0 0 "	42 10 0
U.S. ditto .....	230 0 0 "	240 0 0
Memel, or pipe .....	200 0 0 "	210 0 0
Memel, brack .....	200 0 0 "	210 0 0

### OILS.

	per ton	£14 17 6 to	£15 7 6
Linseed .....	25 10 0 "	27 0 0	
Rapeseed, English pale .....	20 10 0 "	26 15 0	
Do., brown .....	14 17 6 "	15 7 6	
Cottonseed ref. .....	29 0 0 "	30 0 0	
Olive, Spanish .....	23 10 0 "	24 0 0	
Seal, pale .....	27 15 0 "	28 0 0	
Cocunut, Cochin .....	23 10 0 "	23 10 0	
Do., Ceylon .....	22 5 0 "	24 0 0	
Palm, Lagos .....	19 0 0 "	20 0 0	
Oleine .....	0 6 8 "	0 7 6	
Lubricating U.S. .... per gal.	0 4 9 "	0 6 6	
Do., black .....	1 2 0 "	1 5 0	
Tar, Stockholm .....	0 12 6 "	0 15 0	
Archeangel .....	21 0 0 "	21 10 0	
Turpentine, American .. per ton			



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 \* Accepted.

(Continued on page XV.)



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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FRIDAY, APRIL 2, 1897.

### ARCHITECTS AND MANUFACTURERS.

IN a passage of singular force, the author of the "Stones of Venice" dwells on the qualities of mechanical accuracy and thought in design and craftsmanship, which remarks apply in a particular sense to all building arts. The advice given by Ruskin, "not to esteem smooth minuteness above shattered majesty," is at least disregarded in certain arts and manufactures. The axiom that in all things the "utmost completion is perfection" is a noble one in the abstract, but becomes ignoble when it causes us to forget the relative dignities—to prefer the perfection of the lower nature to the imperfection of the higher. "Men," we are told, "are not intended to work with the accuracy of tools, or to be precise and perfect in all their actions." There is a great deal in this doctrine that architects and manufacturers would do well to remember. Much as we now aim at precision (and to be precise and accurate is certainly not a merit to be disregarded), we must not forget that, after all, we may produce mechanically perfect things, like buildings, and woodwork, and decoration, that are yet almost useless and quite inartistic. A building may be technically perfect in the squareness and smoothness and accuracy of its stones and workmanship, and yet be ill-designed for its use. We see illustrations of this in nearly all our technical schools and exhibitions, where we see the most patient, lavish workmanship accompanied by an utter lack of appreciation of what is useful and honest—the most intricate labour and patterns expended on the most faulty designs.

One quality is very rampant in nearly all our modern work—namely, complexity. Complicated arrangements in the internal fittings of buildings is a sign of the times. That they have rather hindered than promoted artistic design cannot be questioned by all who have been engaged in architectural work. The inventor and patentee of new materials and construction has seldom taken the architect into his confidence. He has only regarded the absolute usefulness of his innovation without any wish to conciliate traditional forms or methods. Take, for example, the modern window-sash, for which all kinds of patented arrangements are in the market. The late Building Exhibition at Islington has shown to some extent the large amount of invention and labour that has been called out by this useful feature of building. Several exhibits testify to the ingenuity which has been shown in the matter of hanging and methods of opening windows for cleaning sashes. Of these some are clever; but those who have spent so much time and money in the attempt appear to have lost sight of one point, which the average Englishman or his wife will ever hold necessary—that a window shall be easily opened and shut; that there shall be no complicated parts about it to get out of order, or that will baffle a servant, or even a child. Some of these inventions are certainly ingenious. One of them shows the whole of the frame of two sashes and pulley-stiles made to turn round vertically on pivots fixed in the centre of the top and bottom head and sill, so that the outside of the sashes may be brought inside for cleaning. But to do this the inside architraves have to be hinged and moved, and the heads shifted, and various screws have to be loosened or tightened. We cannot imagine the average housekeeper or tenant

taking patiently to this operation. The fact is, only the simplest arrangements are accepted by the public. The inventor of a complex fastening or mechanical contrivance knows this; the ordinary tenant expects simplicity—something that he can use without trouble and constant repair. A reversible window sash is no doubt very desirable; but the house-owner does not care to pay extra for having his window fitted with these improvements if they entail more trouble than would be spent in the ordinary repairing or cleaning from the outside, or disfiguring the window by excrescence of numerous thumb-screws, bolts, and fastenings on his sash-bars or stiles. Not only use, but appearance as well, have to be considered in these questions. No one cares to have his sashes spoiled by lever fastenings, thumb-screws, springs, and other adjustments, however good they may be in themselves. These excrescences are unfavourable to breadth and solidity of treatment. Mechanical appliances, like rods and levers for opening casements and lights, are almost necessary modern accompaniments, though the simpler they are made the better for architectural effect. A clever ingenuity divorced from art seems to describe many of the modern improvements we see in shops and exhibitions. With things like ventilators, systems of flooring and walling, door furniture, lighting, the manufacturer feels himself independent of the architect. Why is this? Is it not because he can obtain a more lucrative market for his special wares among contractors and builders, whose main object is to secure the largest profit with the least trouble to themselves? The large firm is now more or less of an agent for manufactured goods, and so it comes to pass that the architect has no longer any control in goods of this kind. The brick-maker, and iron-worker, and machine wood-worker, can, for instance, find it more profitable to deal direct with builders and contractors than with the architect, and they are sure of getting a large proportion of their articles specified. The personal contact between artist and craftsman is still an ideal of the future, which does not trouble the manufacturer with a large output, for it would be all up with him if it again prevailed.

Even in new decorative products, which are now so numerous, this same quality of complexity or elaboration appears. The showy decoration in plaster, the elaborate patterns of wall tiles and wall papers, appear, and seem to be inseparable from the very process of production—machine embossing or printing. A multiplication of parts, a repetition of some unit of design, or a "repeat" is almost the soul of the machine-made article, whether in wood, iron, plaster, or any other fabric. And, of course, the public taste likes elaborate ornament and patterns more than plain. All this is directly contrary to what the artist and craftsman, if left to themselves, would have done. They would have thought of a design or a pattern that was suggested by a motive, natural or otherwise, and they would have worked at it tentatively till a good result was obtained. Or the designer would have pondered over some idea, and after long and patient labour would have taken it to the craftsman to work out. A modification or two might be made, and the work would be begun. A modeller, for example, would go to work over the frieze or panel in his studio, and then place it in position till he was quite sure it would look well below. He would put more clay on this part of the design and take it off on another, so as to vary the relief, and then, when finished, the mason would begin his work on the actual stone. But variety and gradation are directly in inverse ratio to elaboration. The more thought and suggestion, the less the complexity or repetition, and this is a principle that holds good with every branch of art. Indeed, it appears

that the less thought a man puts into his work, the more he must make of display. Ornamental display covers a multitude of defects, just as verbosity in language or florid speech often wraps up a barren idea or a sophism.

A second characteristic of modern art is substitution. During the past half-century we have seen a great many substitutions of one material for another. Cement and stucco took the place of stone masonry; it has been used also to a large extent for woodwork, and has been made to imitate other materials, like marble. Iron has been employed in the place of wood and stone. Plastic substances of various sorts are now used to represent timber or wood construction and carving in relief, also stone sculpture and relief; and a great many substitutions have been made both in clay and metal, and other fabrics of a decorative kind. These changes have not been dictated by any artistic considerations in many cases; but rather for the sake of economy and facility of production. In an age of material development, these substitutions have not been without advantage. They have increased the industries, and have in some cases added to the convenience and comfort of buildings. If with the change of one material to another there had been a corresponding change in the mode of ornamentation, we should have not so much to complain of. Stone, for instance, gave rise to its own method of treatment by the axe, pick, and chisel, and the same took place with regard to wood and plaster. Each material developed its peculiar style of ornament; but in substituting wood, or plaster, or iron for stone the modern artist has not always been consistent. We are constantly seeing stone and carving and relief copied in wood and plaster in utter defiance of the nature of the material. Who has not seen iron columns and castings modelled and cast to imitate those of stone? Similar mistreatment is seen in plaster decorations. Ceilings of fibrous plaster and other decorative materials are often manufactured with deep ribs to represent timber panelling; in other cases we find the patterns embossed made to represent modelled plaster or wood-carving. Although our art schools have inculcated and taught the practical limitations of material treatment, we still find the most grievous faults perpetrated by marble masons, designers of wall decorations, carvers, and others. Architects acquiesce in these designs by selecting them; in too many instances they are satisfied simply to organise the trades which they specify or direct, without exercising the slightest judgement on the goods selected. If special firms are specified to do the ironwork, woodwork, plaster decoration, and so on, they, too, submit their own designs. The profession also are not consistent in supplying their details. While every architect worthy of the name prepares details for the mason's or joiner's work, he often omits doing so for other trades, like the ironfounder and smith. But if for the mason, why not for the ironworker? And the decorative faience, mosaic pavement, and plastic manufacturers are generally their own designers. The only explanation is that these trades have been developed outside architectural influence, and therefore stand or fall on their own merits, and they have been to some extent rival substitutions for the older crafts.

### THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE pictures at this Society's Exhibition are rather disappointing. Last year the show was exceptionally strong in works exhibiting some of the higher aims of the painter; the present collection falls below it, and there are many pictures on the walls



which are decidedly beneath the mark, in which paint and brush are more conspicuous than anything else. We are glad, however, to see a few works which atone for much. In the Central Gallery we notice Mrs. Mary Hunt's strongly-painted canvas, "After their Work is Done," the interior of a country stable, in the gloom of which are three worn and aged teamsters at their evening meal. Powerful handling is a quality in this work, which in its realism appeals to the heart. J. Noble Barlow has, in his large meadow-scene (8), given us a naturalistic rendering of the hazy mist of an early spring, the cold light of the sun dispersing the vapour which veils the distant trees. Another clever attempt to paint haze is Fortuné de Lisle's "A Misty Morning" (11). Frank Spenlove-Spenlove has a vigorous landscape—"A Suffolk Common" (20), in which the handling of foreground and middle distance and colour leaves little to be desired. A. W. Bayes, in his view, "Appy Ampstead" (26), a bevy of frolicsome girls arm-in-arm, tripping along a path in the heath, is spirited and clever. Bright colour and reflection are notes in Charles H. Eastlake's "The Harbour" (13), and amongst other landscapes we must pick out for commendation the colour in Arthur G. Bell's "Floods on the Avon" (53); the charming freshness and colour, almost Hook-like in quality, of Alfred S. Edwards's "A Peaceful Haven," a bay of the sea; W. Edwin Tindall's view near "Whitby" (69) is good also. E. Borough Johnson's "The Haven Under the Hill" (132) is intensely green and his conception is crudely worked out, as in the tones of the water. Near it is the large central picture by F. A. W. T. Armstrong, "Idwal's Gloom," a powerfully-painted piece of mountain scenery (138). The painter has chosen one of those great, natural indentations of the mountain where a trickling stream has made itself a channel in the rock. Stuart Hobkirk's "Surf" (3), a luminously-painted study of wave-crests breaking over a sandy beach, with the long blue shadows of the crests, and Beale Adams's "Low Tide" (9) are pleasing studies of the coast.

Turning to figure compositions and *genre* subjects, we see many mediocre performances. "Home, Sweet Home" (129) is one of this sort—a lady playing the piano, a dog by her side; and we might also take exception to a portrait of a little girl (73) in the corner of the gallery, were it not that it is a study of portraiture, and to this extent has restricted the painter to a particular kind of presentment. The little girl, who is holding a pet black "Persian" by both hands, in a rather uncomfortable way for the cat, and is being admiringly gazed upon by a favourite collie, is not devoid of much childish simplicity and grace in the drawing and expression—the rich blue plush frock of the little girl, and the deep black fur of the cat, with its yellow eyes; but still this kind of *genre* is getting rather overdone. R. Gemmell Hutchison paints a large picture, after the Newlyn school; "When Winds are Howling" (34) tells its own tale. In a scantily-furnished room, through the casement of which the wind howls, a young wife kneels by the side of a chair, her hands clasped in prayer, her head resting on it, while a little girl looks sorrowfully at the window. Bowed down with anxious watching and waiting, her forebodings of the safety of her husband deeply oppress her, and the painter has realised the situation. The work is one of promise in this direction. Over the fireplace, William Hunt's large picture, "The Garden of Proserpine," commands attention for its bold scheme of decorative treatment and colour in a grey tone, befitting the incantation that is represented. The painter has taken an incident of the Homeric legend where Proserpine is typified as a seed-corn in a field.

Greville Morris has a pathetic subject, "A Mother's Prayer," painted with considerable power. A. J. Elsley (71) sends a carefully-painted subject, "Homeward Bound," an old couple, mother and father, reading with evident pleasure a letter from an absent son coming home. A very ordinary piece of *genre* is W. Henry Gore's "The Pleasures of Hope" (88). The child's light blue dress and the flesh tints and colouring generally are poor. There is a "painty" look about the treatment that suggests the "pot-boiler" class of pictures. It is a relief to find such a grandly-handled interior as the President's "Siena Cathedral," showing the beautiful baptistery. Into this Mr. Wyke Bayliss has thrown all the charm of his subtle pencil; the colour, reflected light and deepening shadows, and all the mystery and effect of marble and painted legend are represented in the happiest of the painter's manner. The colour and splendour of the vestments and banners add to the interior effectiveness of a masterly drawing. John R. Reid, in his figure study, "Blackheath" (1640), paints a startled golf player who has "missed again," quaint in conception, and pleasing in tone. "The Circus Girl," by J. W. T. Manuel (143), showing a girl on a horse's back, is only clever as a feat of motion. The girl, in white skirt, is making a rapid gyration. We see the back of the horse, and a part of the ring, and the circus manager. As for the colouring, it is hard, and the effect of rapid motion on the fair equestrienne looks eccentric. The large seascape by Edmund G. Fuller, "In Tow" (124), a large vessel being towed by a tug, is only redeemed from hardness and commonplace by the light which gleams over the water, and illumines the white hulk of the assisted ship.

In the smaller galleries we notice a few specimens of the advanced school. Arthur Meade's large canvas, "Happy Days," a group of naked boys disporting themselves, two wrestling, and others looking on, on a sandy shore or beach, is bold in conception; the drawing of the limbs of the boy standing is doubtful; but we must concede to the painter a composition marked by distinct life and motion, the strong sunlight over what we presume to be water, and the sandy cliff and shore, throwing the figures into half-shade. Fred. Milner has a hazy landscape of merit, "Morning Dew" (170), and Adam E. Proctor a clever subject, "At the Ferry." As a painter of the feathered tribe, Horace M. Livens scores success in his several small studies of "Fowls" (177, &c.). He has attentively studied the habits and plumage of birds, and his pictures are something more than commonplace transcripts, and are full of life and beauty—not mere copies, but things to be studied and admired. A nice bit of sunshine and harbour is by E. Reginald Frampton, whose Cornish work is of much merit. "Faith, Hope, and Love," by Robert Morley, is not very clear as an exponent of the three virtues. A young girl is seated by the side of an aged parent in bed, whose hand only is visible. She holds a large family Bible in her lap, and near her is a favourite dog, the latter the best piece of painting on the canvas. A portrait by J. J. Alsop (204) is full of character. A clever twilight effect on a river (205) is by Frank Dean, and a "study" of a girl's head by Cecil Rose Burnett (207) must be mentioned for its drawing and nice colour. Flimsy and fictitious is a picture of "A Garden Party," a very ordinary and used-up sort of *genre*, the costumes in which may belong to any date. There is some nice feeling and poetic sense of colour in Frieda-Rusti-Hoeck's "Harmony," a young lady seated at a piano, a coloured Chinese lantern hanging above her. We cannot quite fathom E. Machell's symbolic design, or rather piece of decoration, "The Exiles." Better and less involved subjects we have seen from his pencil; the

figures are rather crude, and perhaps the best parts of the composition are the background and carved frame, both of which exhibit talent. Robert Christie's "study" of a portrait of a lady (229) and William Strutt's allegorical picture "Peace" (220) are worth attention, the latter for its care and execution, and the conception which inspired the painter. As a strong note of colour, a bright scarlet against a violet ground, we must note W. T. Warrener's "Portrait of a Lady," a decorative treatment of portraiture with a motive which takes it out of the commonplace. "Hero" (237), by T. Watt Cafe, is at least graceful in drawing—a beautiful woman clinging to a rock on a dark tempestuous sea. We must also note in passing Robt. Morley's "In Spring Time" (244), a pretty study of birds on a branch of may blossom; the large landscape by Alfred de Breanski, "Departing Day," bathed in a glow of light; Wright Barker's landscape, "Off Duty" (254); the charm of tone in Adam E. Proctor's little picture "Loading Esparto, Oran" (263); a large upright canvas by Arnold Helcke, "A Morning in the Marshes"; and Leonard Watts's "Flowers of the Field." Miss Florence FitzGerald has a not unpleasing composition, "Through the Woods," but the field starred with narcissi is crude and wanting in gradation of tone. Martin Bruce paints (277) a vessel under full sail ploughing her way through deep blue waves, strong in colour and breadth of treatment; and we must name Miss Florence M. Briggs's vase of autumn flowers (284) as an effective colour study, and Arthur A. Dixon's "Deserted," a country house buried in luxuriant vegetation. "The Last Leaves of Autumn" (301) has a softness and tone which is pleasing. The beech trees and banks of river are sympathetically painted by Mr. Thomas Ireland. Very nice colour is seen in Tom Clough's "Welsh Interior" (303), and Henry Bailey's "Homeward" (307) is strong in sunlight effect. "Mussel Gatherers" (330), by H. Caffieri; a "Common," by Robert Hume" (332), are broad and sharp in handling. Joseph Finnemore's large subject, "Country Fowls for the London Market" (348), is in his clever manner. G. C. Haité has a spirited subject, "On the Ice," and a charming heather clothed landscape (387) full of colour. In Albert Kinsley's landscape (377) there is much subtle charm of tone and atmosphere. In the water-colour rooms we must speak in praise of Val Davis's "Gathering Fuel" (402), Harry Sylvester Stannard's "A Frosty Evening" (404), a beautiful drawing of the "Interior of Treves Cathedral" (420), by the President, and some clever sketchy figure studies by Oscar Eckhart over the fireplace; drawings by W. Harding Smith, Burnard, W. T. Winter (451), Leopold Rivers, R. E. Brockbank, and others, a collection which compares favourably with the other galleries.

#### ADAPTABLE SPECIFICATIONS. —XXXV.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued.)

**ORDINARY** three-coat plastering having been dealt with, which on walls is known as "render, float, and set," and on ceilings and partitions as "lath, lay, float, and set," various other kinds of work in the same trade require a short notice.

*Trowelled stucco* is a superior kind of three-coat plastering, which admits of being painted on. Being executed like common plastering, with chalk lime or other nearly pure or "fat" limes, it is only suitable for internal works, and must not be confused with the stucco formerly used for the outsides of buildings, the basis of which was hydraulic lime. The first and second coats in

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trowelled stucco do not differ from those in common three-coat work. The second or floating coat must be perfectly dry before the final one is applied, and this is composed, not of "fine stuff" alone, but of two parts of "fine stuff" mixed with one part of sand. This mixture is spread on the floating coat with a large trowel, so as to be about  $\frac{1}{16}$  in. thick. The surface is then wetted, and rubbed down with a hand-float till it is hard and smooth. If trowelled stucco is not painted or distempered its tint will depend on that of the sand in the final coat, unless the architect likes to tint it by mixing with this some cheap and permanent pigment, such as umber, ochre, or Venetian red. To avoid patchiness when this is done, the colour, finely powdered, should be mixed in bulk with the dry sand before the "fine stuff" is added. *Bastard stucco* is executed much in the same way as trowelled stucco, but has a little hair in the last coat. *Rough stucco* is an attempt—seldom very successful—at imitating the effect of an ashlar surface. It contains more sand, and sand of a coarser kind, than trowelled stucco, and to roughen its surface the hand-float used in finishing it is covered with a piece of felt.

There were once many ways of executing decorative plasterers' work, but in modern times they have nearly all been abandoned for the cheapest and poorest way—that of casting it. The Moors in Spain, as Mr. Street notes, "used a very fine material for their plastering, and then carved it, as if it had been stone. The consequence is, that there is endless variety of design everywhere, and any amount of undercutting." It was delicate in relief, and, as far as possible from resembling "the huge cornices of coarse canvas strained over a light framework and washed over with gauged stuff," which, according to a modern writer, "make a great display in the interior of the Albert Hall." Modelled plaster-work attained great perfection during the Renaissance period, both on the Continent and here. An interesting historical notice of it was read by Mr. G. T. Robinson, F.S.A., before the Society of Arts in April, 1891. It is, of course, essential in stucco meant to be moulded by hand, that it should be very slow in setting. A grey stucco of this kind was composed of powdered travertine, 5lb., and 2lb. of slaked lime mixed and beaten up with water into a fine paste. When it was desired to make it more delicate, marble dust was used instead of the travertine. The white stucco duro was also formed of white lime mixed with marble dust, and was so hard and smooth that the ancients, according to Vitruvius, sometimes polished it, and used it as mirrors. The very elaborate modelled stucco at Nonsuch House, built in the reign of Henry VIII., is said to have been "done with plasterwork made of rye dough, very costly." Mr. Robinson states that this makes an excellent compound for modelling in. "It retains its pliancy long, dries hard, and is of a beautiful old ivory tone." Stamped plaster, like that which is modelled, requires a material which will keep soft for days, and this, according to Mr. Aitchison, A.R.A., may be produced by adding treacle, milk, sugar, or size to the lime plastering. Donatello, in the early 15th century, seems to have been fond of modelling in stucco duro, and sometimes mixed it with pounded brick and glue, producing a material which had very much the appearance of terracotta.

The modern plasterer, with rare exceptions, cares for none of these things. He cannot even appreciate the variety which results from stamping by hand the same pattern over a surface which is sure to vary in different parts of it from harder to softer. He "runs" his cornices in plaster of Paris, and casts his ornaments in the same material. Cornices are usually executed in a mixture of lime putty and plaster of Paris, in equal parts. The plaster so used should be of the best quality, and not, as it sometimes is, of the best and common qualities mixed. The common quality sets faster than the best, and therefore, when they are used together, cracks are likely to result. Where the projection of a cornice is not great, a ground for it may be made by running a mould, "muffled" to the thickness of about  $\frac{1}{4}$  in., on a ground of good hair mortar. On this ground, the plaster cornice itself may afterwards be run. Cast ornaments are formed by dabbing plaster of Paris, in a semi-fluid state, and by means of a brush, into the moulds prepared for them. The best treatment for elaborate plaster ceilings is to wax-polish them, or, in default of this, to leave them of the natural colour of the material.

For external plastering, the choice is practically

between hydraulic limes—that is, limes which are nearly or quite uninjured by wet, and Portland cement. For filling in half-timber work Dorking lime and hair mortar, gauged with Portland cement, is recommended, or if a finer surface is required, the same composition, with a "setting coat" of fine putty, also gauged with cement. The cement in this last case protects the chalk lime from the action of the weather. The hydraulic limes require special treatment. Most of them do not immediately fall to pieces when wetted, as chalk lime does, and only go into powder after a long exposure to damp air. They need, therefore, to be finely ground before being slaked. Grey chalk lime, usually called in London "stone lime," and prepared at Dorking, Halling, Lewes, Petersfield, and Merstham, is feebly hydraulic. The blue lias limes are more powerfully so. They swell but little in slaking, and will set even under water. Aberthaw lime, begun by Smeaton in the Eddystone lighthouse, used to set when submerged in about a day. Buxton and Barrow-on-Soar limes are nearly equal to Aberthaw. Lyme Regis lime is another of the same class, which was largely used in the London Dock extension works. Halkin lime was similarly employed in the construction of the Liverpool Docks. These and similar materials contain silica and alumina as well as lime, and it is to this composition that they owe their hydraulic properties. The old-fashioned stucco, which was largely used before Portland cement was invented, about 1824, contained 2 or 3 parts of washed sand to 1 of hydraulic lime. Before applying it, the wall was thoroughly wetted. Then it was brushed over with the stucco in a creamy state, like whitewash, and lastly a coat was applied as in ordinary "rendering." This was sometimes floated to make it more even.

Portland cement may be described as an artificial imitation of the hydraulic limes—but an imitation which is superior to the original. Where chalk is not obtainable, some of these limes may be used in the manufacture; but most of this cement as made in England is simply prepared from chalk and clay. Ordinary white chalk contains about 57 parts (by weight) of lime to 43 of carbonic acid. Clay of a suitable kind for this manufacture may consist of about 69 parts silica, 12 of alumina, and 19 of oxide of iron, soda, potash, &c. The first process is to mix the clay and chalk, which may be done in various ways—as, for instance, by edge-runners or a wash-mill. Whatever way of mixing is adopted, it is of the greatest importance that the clay and chalk should be in the right proportions. Three parts of white chalk are usually added to one part of clay. Where grey chalk is used, such as that found on the Medway, four parts of it to one of clay form, approximately, the best mixture. But the exact proportions vary with the nature of the materials, and have to be decided on from time to time by actual experiment. Moreover, the quantity of moisture which is present, both in the clay and chalk, differs at different periods, and has in all cases to be allowed for; so that the correct regulation of the proportions is not quite as easy as it might at first appear to be. In fact, it is only managed by the continuous preparation and burning of small samples of the mixture. These samples are treated just as the bulk of the material they represent will subsequently be—that is, they are dried, placed in a sample-kiln and burnt, and then finely powdered. The powder is sifted in a fine sieve, and a couple of pats are made up from it as specimens, by being formed into a paste with the smallest practicable quantity of water. When sufficiently set, one pat is put into a basin of water to test its hydraulicity, while the other is left in a dry place. If, after 24 hours, the water sample continues sound, that is, uncracked, and if the air sample is of a bluish grey, without brown specks or stains, the proportions of chalk and clay may be considered right. If, on the contrary, the water-sample cracks or goes to pieces, there is too much chalk in the mixture; and if, on the other hand, it has set well and continues sound, but if the air-sample is brown in colour instead of bluish grey, too much clay is being used. The chalk and clay must be intimately mixed, so that no uncombined particles of chalk may ultimately pass into the cement in the state of lime.

The wholesale manufacture of cement is practically a repetition, on a large scale, of what was done with the small samples. The mixed chalk and clay have to be thoroughly dried before being placed in the kilns. These are of various shapes and sizes, but those which will each produce 30 tons of cement are found convenient. If the

mixture contains a rather full proportion of chalk, it will require more burning; but if it tends to be overlaid it will require less. The kiln is filled by first laying some bundles of brushwood on the iron bars which run across its lower part. Coke is laid on the brushwood, and then alternate layers of raw cement and coke till all the space is filled. The burning takes several days, and if all goes well, the "clinker" or burnt cement in the unground state will be greenish black in colour. Parts of it are generally only partially burnt. These are reddish in colour, and have to be picked out by hand and reburnt. The clinker, which is very hard, has first of all to be broken into small pieces; then it is put into the grinding mill and very finely pulverised. Fine-grinding is more insisted on by engineers than it used to be. Thirty years ago Mr. Henry Reid, C.E., pointed out that a very small part of the cement made in England would pass a No. 40 gauge sieve, that is, one with 1,600 perforations to the square inch, without leaving a large residuum behind. Now the London County Council stipulate that what they use shall pass a sieve with 5,800 meshes to the square inch, without leaving more than 10 per cent. of residue. There is no doubt that this insistence on fine-grinding is wise, at least where strength is required. Without it, the heaviest and hardest, or, in other words, the most valuable portions of the cement are chiefly what constitute the "residue" which will not pass through the sieve, and this residue, as long as it is coarsely ground does not act as cement at all. At best it simply adulterates the finely-ground part, almost as so much sand might do, and yet all the while it only needs fine-grinding to make it increase, instead of diminishing, the strength of the material in which it occurs. The cement, after being ground, should, if possible, be spread out and exposed to the air in a weatherproof building for several weeks before it is used. As long as it is not actually damped or wetted, exposure, even for a prolonged period, does it good. In this particular it is just the reverse of Roman cement, which has to be kept in casks, and is injured by the action of the air.

A strong cement—that is, a cement which will bear a high tensile strain, is almost invariably a heavy cement. In one series of experiments, for instance, where the area exposed to tension was  $2\frac{1}{4}$  sq. in., cement weighing 106lb. to the struck bushel broke with a pull of 472lb. That which weighed 112lb. to the bushel broke with 687lb., that which weighed 119lb. broke with 777lb., that of 124lb. to the bushel broke with 819lb., and that of 129lb. with 920lb. But it is quite possible to have heavy cement without great strength, because, in spite of its heaviness, it may be imperfectly ground, and in that case its good qualities will be, for practical purposes, non-existent. Hence the necessity for the sieve test. Heaviness, however, means a large expenditure of fuel in burning, and fine-grinding means a large outlay in steam power, so that a strong cement is necessarily an expensive cement. This very strong cement, however, though it is highly desirable for structural works, is of no advantage to the plasterer, and he can safely use much lighter weights, provided they are sound in other respects, and of good colour. A cement weighing about 97lb. to the bushel, and comparatively quick-setting, will generally answer his purpose, though the architect would not be well advised if he approved it for the use of the bricklayer. It should be tested under water, to guard against the presence of free lime.

For cement face work two parts of washed sand to one of Portland cement will do very well; or equal parts of cement and sand. One coat of cement should be thoroughly wetted before the rest is put on; but the last coat should not be wetted on completion. Portland cement work, if good, needs no paint to preserve it. In any case it should not be painted till it is six or eight months old, or the paint will be patchy and discoloured. The "blowing," or blistering of cement faces may arise from more causes than one. Particles of free lime in the cement may produce it. These, being more or less protected by the adjoining material, do not always slake at once when the cement is wetted; but by degrees, as moisture reaches them, they expand and push away their surroundings. Coarsely-ground particles of cement—the "residue," in fact, which would be left on a fine sieve—may have the same effect. Being larger, they do not become completely hydrated when the more finely-ground portion of the material does; and when, finally



they do combine with water, they separate from the general face, and cause unsightly cavities. Fine cracks, again, are a frequent blemish in cement faces. They may arise thus. The first coat on a wall is gauged with two or three parts of sand; whereas the finishing coat contains hardly any sand at all. The two coats therefore swell and shrink unequally, and the surface one, being the thinner, gives way; just as the setting coat in ordinary plastering will do, if put on before the floating coat underneath it is sufficiently dry. It is better to put more sand into the finishing coat of Portland than to allow any considerable difference of this kind between that coat and the one below it.

#### THE SOCIETY OF ARCHITECTS.

THE fifth ordinary meeting for the present session of the Society was held at St. James's Hall, Piccadilly, on Thursday evening in last week. Mr. Robert Walker, J.P., the president, occupied the chair. Mr. Henry George Boswood Ridges, of 103, High-street, Southampton, was elected as a member.

#### TECHNICAL SCHOOLS FROM A SCHOOLMASTER'S POINT OF VIEW.

A paper on this subject, illustrated by some half-dozen dissolving views, was read by Dr. C. H. Draper, president of the Rutlish Science School at Merton, Surrey. Legislation for secondary education is, the lecturer observed, expected shortly. I hope that legislation will involve building, and I hope that this society will see that the new buildings are better adapted to their work. As to the site, where attainable, it should be of such a shape and so situated that the architect may (1) obtain adequate approaches, (2) give the building that shape which will afford the maximum efficiency, (3) allow plenty of light and fresh air, (4) minimise noise and chances of accident. The chief exit should be into a side street. *The Building.*—Before entering into detail, a few general remarks may be desirable. While all will agree that a school should be of good appearance, a comparative absence of ornament is desirable. No attempt should be made to adapt a school to any other than its primary object. School buildings are often seriously damaged as regards their convenience for work by being built for a school and for some other purpose. What is a fine room in the eye of the amateur is often a hopelessly bad class-room. The pupils' entrances, which are not always what the architect considers as the main entrance, should be large; the passages broad, straight, and well lighted; the staircases also broad, of easy slope, with large landings and no winding steps; skylights should be avoided for class-rooms; blinds should be provided for all except North windows; the walls should be as impervious to heat and cold as possible, and for the same reason all rooms should have ceilings—there should be no open roofs; no ordinary doorway should be less than 3ft. wide; all the pupils' desks or benches should be placed end-on to the light; the lower panes of windows which are not above the pupils' heads should be filled in with frosted glass; double windows should be provided where such look out into a noisy street; rooms in which the work produces smell or noise should be placed away from the ordinary class-rooms; the way to one room should not be through another; the walls should be light and cheerful. Throughout the building, give us plenty of room, light, and fresh air, with freedom from extraneous noise and interruptions. *Rooms Required.*—Now, what rooms are required in a school of this type? The answer to this question will vary somewhat, according to the curriculum of the school and the age of the scholars. However, seeing that much must be common to all schools of the same class, I have ventured to draw up a simple plan showing my views. In this are shown the following rooms: Large hall, class-rooms, art-room, head master's room, visitors' and committee room, store-room for books and stationery, cloak-room, chemical laboratory, physics laboratory, mechanical laboratory, balance room, store and preparation-room for chemicals, &c., lecture-room, assistant masters' rooms, gymnasium, dining-room and kitchen, workshops for wood-work, bicycle shed under stationery-room, quadrangle containing boiler and engine, covered playground. To these some schools would wish to add a reading-room and library, music-room, modelling-room, biological laboratory. A separate caretaker's cottage should be

provided in the grounds. The arrangement of the rooms is the next point to be thought of. Two main divisions are apparent: (a) The assembly hall with the ordinary classrooms grouped round it; and (b) the special rooms placed at the back. The building thus consists of two parts, the front part looking outside something like a church with a nave and aisles, the back portion consisting of a quadrangle of comparatively low rooms for use as laboratories. Between the two parts of the building a passage 8ft. or 10ft. broad runs across the building. On the right-hand side is the entrance for the senior scholars; on the left the entrance for the juniors. These entrances open into the school-grounds, or each into a wide external passage that runs down the side of the building from the street to the playground in the rear. It is important that these exits be broad, and not easy to block. *Main Building.*—There is no doubt that the plan which makes a central hall with the class-rooms grouped around it is very convenient. The large hall serves for general school assembly, and forms a considerable factor in the formation of the spirit of unity in a school. The class-rooms arranged round have easy access and ingress; at a given signal the whole school can pass from class-rooms to hall, or *vice versa*, in a very short time, and with no confusion. The head master has easy control and supervision of the whole. An architectural advantage of the central-hall system is that it allows, if necessary, another exactly similar set of class-rooms to be placed on the floor above, opening on to a gallery that runs round the hall. This gives the least waste of available space. The hall would, of course, be used for speech-day and general gatherings, and is the only part of a school building where any extra scholastic consideration may be at all entertained. A good platform should be included in the plans. If no separate gymnasium exist, the gasfittings and other details of the hall should be such as will allow gymnastic apparatus to be set up there. *Class-Rooms.*—A seat should be provided in the class-rooms for every boy. The accommodation of the school is the accommodation of the class-rooms. The illustrative plan shows ten class-rooms with accommodation for 300 or 350 boys, taking 30 boys as a usual average number in a class. As intimated already, this accommodation could be readily doubled by building another set of class-rooms over those on the ground floor. The points of importance in a class-room are area, height, shape, relative positions of door, windows, and fireplace (if any). Here is it specially necessary to avoid the temptation to build fine (i.e., over-large) rooms. As the classes in a school are not all the same size, the class-rooms should form a graded series as regards area. In an ordinary secondary school, the lowest classes are the largest, having in them, according to present practice, from 30 to 40 boys; the highest classes often have not more than half that number. Waste of room and of money often arises from the non-recognition of this fact. At the same time, the rooms had better be too large than too small. The shape is a matter of considerable importance. About square is the best shape; but when that is not obtainable, increase the depth rather than the width. The angle subtended at the teacher's desk by the front row of pupils' desks should not be greater than a right angle, or he cannot properly see the whole class at once; hence the room should not be too wide, but within reasonable limits. Greater numbers should be provided for by an increase of the depth. Moreover, the class-rooms should not be dotted promiscuously about the building. Classes next to each other on the school-roll should occupy adjacent class-rooms. These various considerations have induced me to arrange the class-rooms as shown on the plan. Five are on one side of the hall, and six on the other. If one of the largest be devoted to art, there are three rooms each suitable for about 40 boys, two for 30 or 35 each, four for 25 or 30 each, and one for 20 or 25. On this plan, all the rooms cannot be approximately square, and increased accommodation has been obtained by increase of depth only. This, however, is much better than increasing the width only. Teaching broadside on in a long, narrow room is very difficult. I recommend that the rooms on the junior side of the hall should be broader than those on the other side; thus one may keep closer to the ideal shape. The sizes and shapes of the rooms were arrived at from measurements made in my own school. Supposing each boy to have a desk to himself, as he should, he occupies, including

gangways, about 3ft. or 3½ft. frontage, and 2½ft. or 2¾ft. in depth. If, then, we put for the larger classes six desks across the room (and six is quite enough), the desks and gangways give a width of 18ft. to 20ft., and allowing 2ft. at each side, I have arrived at 22ft. or 24ft. as a suitable width. For the smaller—i.e., the senior classes, the smaller width would be sufficient; for the larger junior classes the greater width is preferable, but I would not exceed about 25ft. As to the depths of the rooms from front to back—i.e., the way the pupils sit, they were arrived at as follows:—Two rooms are shown to seat 42 pupils; the seven rows of desks occupy 19ft. from front to back, and a space of 12ft. is left for front and back spaces. This gives a depth of 31ft. The next room is the same size, but only contains 36 desks; most teachers would probably prefer this arrangement. The next two rooms are a size smaller, the depth being 28ft. in each case; one is shown with 36 desks and one with 30. The desks occupy a depth of about 17ft., leaving a space of 11ft. for front and back. The third group as regards size consists of four rooms, in which the desks, five deep, occupy a depth of about 14ft., which, with 11ft. for front and back space, gives 25ft. as the depth of the room. One class-room is shown with 20 desks, its size being about 22ft. square, which is an excellent size for senior class-rooms. The rooms first mentioned would be better if they approximated somewhat more closely to the shape of those last described. As to height, the class-rooms should be moderately lofty; not less than from 12ft. to 16ft. About 20sq.ft. and 300c.ft. per boy seem to be suitable figures; but the cubical content may be considerably reduced if an adequate system of ventilation be provided, as it most certainly should. The relative positions of door, window, and desks are important. The windows, and plenty of them, to the left of the class, and nowhere else. A good space in front of the class, and the door opening directly on to this space, so that the passage in and out of the room may take place without confusion, and work can be easily carried on in front of the class. The front row of pupils should be from 9ft. to 12ft. distant from the wall they face. Blinds should be provided for every class-room, when the school is built. The walls should be smooth and without buttresses, &c., which diminish their availability for maps, diagrams, and lantern work. Slate or glass slabs about 3ft. wide might well be built in the wall all across the front of each class-room to serve as blackboards, although they need not be black. The lower part of each classroom should be boarded or faced with hard clean-looking tiles. We now come to the rooms that are devoted wholly or mainly each to a special purpose. *The Art-Room.*—Most schools do not require more than one room; but that one room should be considered by the architect mainly in reference to the light. It should, if possible, face the north, and must be lighted by one, and only one, large window. Of all things cross lights are to be avoided in an art-room. This window should be without thick piers or mullions. If these be present, the window acts not as one, but as two or more. This the art master would not forgive; there must be no mullions of appreciable size. The single window should be high up, and be provided with a sliding shutter, by which the quantity of light may be regulated. If artificial light be put in, as is generally requisite, an art master should be consulted as to the method employed. The general system used throughout the building is here probably useless. The light should be powerful, but not a naked electric light. It should not be concentrated in a point, although proceeding from one centre only. The best arrangement I know of is a ring of gas jets about 15in. in diameter, fixed at a height of 14ft. or 16ft. from the ground. *Cloak-Room.*—The cloak-room, or rooms, should be near the pupils' entrances. In the illustrative plan, one large room is placed at the end of the hall. So far as convenience alone is concerned, it would be preferable, since there are two entrances, to have two cloak-rooms, and, if possible, more. The accommodation should be calculated for the maximum number of pupils, the pegs being placed 10in. or 12in. apart. This room should have ample exits and entrances. The plan shows four, an entrance and an exit on each side. An avoidance of crowding is here essential. Ventilation is also especially necessary here, and if no effective general scheme of ventilation be provided, the cloak-room should have free connection with the open air. *Master's Rooms.*—A room



should be provided, not only for the head, but also for the assistant masters. In a school of 300 boys, probably two assistant masters' rooms are desirable. The plan shows the head and assistant masters' rooms at different ends of the building. This assists in insuring that no part of the premises may be too far away from supervision. *Visitors' and Committee Room.*—It is also desirable to have a room for visitors and committee meetings. A kitchen and dining-room form an important part of a town day school. The size of the dining-room depends more upon the character of the neighbourhood than upon the size of the school. Where the pupils come from a distance a large room is necessary. *The Gymnasium.*—As to this, I have only to urge that a gymnasium should always be included in school plans whenever possible. A covered playground is also very useful, and should not be omitted. In the plan it is intended that it should be placed against the end wall. A store-room for general school material is necessary, and may conveniently be placed near the headmaster's room. As it need not be lofty, I have placed under it a bicycle shed, as many of us now have a considerable number of these ubiquitous articles appearing on our premises every day. This shed is, of course, conveniently placed near the entrance. *Rooms Designed for Practical Work.*—Concerning this group one or two general remarks may be made. The operations conducted in them cause smells and noises which must not be allowed to reach the classrooms. The plan shows them separated from the main building, which is the most effective way of overcoming the difficulty. Where that plan cannot be adopted, special arrangements should be made, such as double ceilings or walls, to assist in accomplishing the required end. *Carpenters' Shop.*—This should be a plain room furnished with benches, each about 7ft. long and 3ft. wide to accommodate four boys, and placed as usual end on to the light. This room should have a portion marked off at one end as a store place for timber, and should communicate directly with the outside passage in order that timber may be delivered easily in lengths. This, being a noisy room, is placed as far away from the class-rooms as is possible. The size of the room shown is 30ft. by 18ft. *Physical Laboratory.*—I recommend two rooms, one for the simple laboratory work included in an ordinary elementary course, the other for a more advanced work in which machinery and power are required. The plan, therefore, shows two rooms—one marked for mechanics. The general physics room should be furnished with plain strong tables placed according to the general school rule end on to the light, and with gas laid on to each pupil's place. The table surface allotted to each pupil should be about 3ft. or 4ft. by 2ft. The plan shows two double benches, each 19ft. long and 4ft. wide, each intended to accommodate ten pupils, there being room for about ten more along the sides. Water need not be laid on to all these benches; but two or three sinks with water laid on should be provided at convenient places. A fume-closet, also not shown on the plan, is useful for batteries and fuming acids. It is convenient to have in this room firm stands for delicate instruments that are affected by vibration. The plan, therefore, shows along each side of the room what are intended to represent slabs of slate let into the wall. If the room be not on the ground floor, and is intended for electrical work, some such means should certainly be taken for insuring freedom from vibration. It is also advisable that this room should contain as little iron as possible. A portion at least of the physics-room should be capable of being darkened, as for some purposes a dark room is requisite. Well-fitting inside shutters throughout this room are an advantage. The room devoted to mechanics is placed next to the quadrangle that contains the engine and boiler. The feature of this room is a shaft running along one side which transmits power from the engine outside to lathes, dynamos, &c. The details of the arrangements and fittings would necessarily be left to an expert. Balances being required in both chemical and physical laboratories, the balance-room has been placed between them. It is necessary that this room should be readily accessible from all the laboratories. *Lecture-Room.*—This room, which is also situated near all the laboratories, should contain a gallery, a good lecture-table, a surface for work with the optical lantern, and facilities for readily obtaining darkness or light at any time. The method of lighting, both natural and artificial, should therefore be specially considered. If the daylight be

admitted at the side, as shown in the plan, probably well-fitting shutters would be all that was necessary. The doors of this room should be opaque throughout. The artificial light should be controllable by a stopcock placed on the lecturer's table. This table is an important feature in the room. It should be from 12ft. to 20ft. long, about 3ft. high, and 3ft. wide, with gas and water laid on, a pneumatic trough at one end, and cupboards underneath. Various contrivances are useful, and the table should be carefully constructed to suit the work to be done on it. The gallery may contain four or five rows of seats, each step rising about 7in. above the one in front, and being about 2ft. 9in. wide. *Stores and Preparation-Room.*—Next to the lecture-room may be placed a small room as a preparation-room for the lecturer. Adjacent to it is conveniently placed a store-room for chemicals, &c., which it is desired to keep under the master's control. *Chemical Laboratory.*—This room needs special fittings, special ventilation, and special drainage. It should contain suitable benches, fume-closets and sinks, and an open chimney should be provided for a muffle furnace. All these arrangements should be set out in the architect's plans. And as it is not at present a customary feature, let me emphasise the provision of a flue or chimney, at the base of which a furnace may be placed. Some operations required in school laboratories cannot be effectively carried out without such a chimney. A large sink in one corner of the room is desirable. As to ventilation, leaving myself the battle of systems to be fought out by experts, I invite every architect who has a school to build to set aside from 5 to 10 per cent. of the available money and a considerable portion of his thought to the attempt to provide an adequate system of ventilation. Let us have the best available. As far as I understand the matter, it appears to me that the idea of cost need not stand greatly in the way. Reduce the cubical content of the building by 5 per cent., and spend the money thus gained on ventilating it. Rooms in which the air is changed three times per hour need not be so lofty as rooms where no provision is made for ventilation. The cost is not great when the ventilating flues and shafts are designed with the building instead of being afterwards put in; but, great or small, the necessary expense should be faced. Fresh air is more good to anybody than chemistry, and for the major part of us it is better to be healthy than either wealthy or wise.

Mr. H. GOODMAN QUARTERMAIN proposed a vote of thanks to the lecturer, and Mr. HUGH MACAN, in seconding it, suggested that the society would do well to appoint a committee of experts to draw up conditions for the general planning and construction of technical schools. Within the past five years no fewer than 380 such buildings had been erected in Great Britain. On the point of economy he differed in some respects from Dr. Draper, and it should be remembered that architects who designed technical colleges were not always allowed to exercise their discretion, but were fettered by the fact that their clients were, comparatively speaking, impecunious. When, therefore, architects found their work criticised they might console themselves with the reflection that their ideal aims had been hampered by want of money.

Mr. HENRY LOVEGROVE, vice-president, supported the vote of thanks, observing that, while the details of the fittings and arrangements shown by Dr. Draper were admirable, the suggestive plan was, in his opinion, far from perfect. The portion to the left was very like what he might term the stock plan of the London School Board. While the portion to the right hand had too many passages, the engine-room should be in the basement, and the gymnasium might be with advantage located on the upper floor of a detached building, the space beneath being utilised as a covered playground. The halls and class-rooms on the left might well be planned over the rooms on the right. The important details of arrangement of desks and partitions, and doors and windows were obviously the outcome of much thought on the part of the lecturer, whose great kindness should be properly appreciated by members of the society.

Mr. LOUIS JACOB, A.R.I.B.A., said he had lately been studying the class of buildings described by Dr. Draper. The lecturer had suggested that no part of a school building should be planned with a view of being used for any other purpose than that for which it was built. He did not know whether that was the result of his experience at his own school at Merton Park,

where the hall, instead of being central, was at the side, and was let out for entertainments. He could not understand why the limit of depth for classrooms should be fixed at 22ft. from the window, as a room 25ft. deep was well lighted if 14ft. in height. He considered that it was a disadvantage to have as many as seven rows of desks; a master with a rather weak voice would not be well heard by the boys in the back rows. He had met masters who would prefer a room 25ft. deep from the window with few rows of desks as being easier to superintend. Then again, if the laboratories had to be built over the class-rooms, they would be very long and narrow if only 22ft. wide—that was, if they had to accommodate 40 students. Dr. Draper had mentioned that it was better that the boys' exit should be into a by-street, and not a main thoroughfare; but he had said nothing as to the headmaster's room superintending the boys' playground. Which did the lecturer consider the best position for the room—near the principal entrance or overlooking the playground? He cordially supported the vote of thanks.

Mr. A. E. SALTER, of the Stanhope Technical School, said, from the standpoint of those engaged in technical instruction, the paper was full of valuable suggestions. He objected to the proposal to place the caretaker's rooms in the building itself.

Dr. DRAPER briefly acknowledged the vote of thanks, remarking that he had not expected to find his suggestions adopted wholesale, and he would freely admit that he had not made a special study of economy.

#### NOTES FROM PARIS.

**SAINT PIERRE DE MONTMARTRE**, one of the oldest churches in Paris, and well-known to English tourists, is condemned, and in less than a few months will probably be demolished. Services have been constantly held up to a few days ago in this picturesque old church, which, before the construction of its immense neighbour, the basilica of the Sacré Cœur, was the crowning point of the high hill of Montmartre. The building threatens to fall at any moment, and has, therefore, been condemned by the authorities. The site of the present church was once occupied by a pagan temple dedicated to Mars in the time of the Romans, and later by a Christian church, afterwards destroyed by the Normans, and replaced by a chapel built in the 12th century by the monks of the order of Saint Martin. This chapel was bought by Louis VII., who, at the request of his wife Alix, completed the present church, and also founded the rich monastery, which afterwards became the Abbey of Montmartre, made so famous by the intrigues of Henri IV. The church is the only remaining vestige of the 12th century, but an ugly façade in Classic style was added in 1680 to the building. The apse, known as the "Chœur des Dames," by reason of the number of abbesses who were buried in it, is a marvel of architecture; the finish of the details and the harmony of the ensemble make it much admired by architects and archaeologists, and it has been classed amongst the historical monuments. It is probable that the whole church will be demolished, but an exception may possibly be made of the apse, which, if preserved, would require complete restoration, an expensive work, for the immense weight of the Sacré Cœur and the neighbouring reservoir has occasioned such a movement of the ground on which the smaller church stands that the foundations have become dislocated, and would also have to be rebuilt; it is, however, to be hoped that, in spite of the difficulties and expense, this jewel of architecture will be preserved and restored.

The Académie des Beaux-arts at its last sitting awarded the prize of £40, foundation Achille Leclère, to M. Duquesne, pupil of M. Pascal. The subject of the competition was inspired by the review given at Châlons in honour of the Czar, "A Military Railway Station suitable for the Reception and Meeting of Two Heads of State." According to the programme this temporary railway station should comprise, besides the building necessary for railway purposes, two reception saloons, an immense banqueting hall, and a large vestibule communicating with the saloons and the hall, and preceded by a portico with triumphal entrance; the whole to be constructed of light materials arranged in a decorative and magnificent style, having in its ensemble a combination of military and festive aspect in



harmony with the solemn, but temporary, use to which the building is destined.

French art has lost a conscientious painter and productive draughtsman in the person of Charles Henri Pille, deceased at the age of 53. An old pupil of Felix Barrias, member of the Jury of Painting at the Salon, president of the Société des Artistes Dessinateurs, Pille was a personality entirely Parisian, and well-known on the heights of artistic Montmartre. He has left behind him a considerable quantity of work, a certain number of historical paintings, and more especially an immense quantity of social and architectural compositions depicting the life and architecture of the Middle Ages in the North of France, in Flanders, and in Switzerland. Those who have seen his drawings, a large number of which were published in the *Courrier Français*, must have been surprised at the remarkable facility, skill, and boldness with which he depicted architecture, ornaments, and decorative ironwork, and portrayed the antique costumes of the knights and noble dames who always formed a foreground to his composition and some of these were so remarkably free and bold; and so harmonious in design that the artist seems to have had an inspired recollection, permitting him to so wonderfully interpret the archaeological riches of the past ages.

The jury for the section of painting for the Salon of the Champs Elysées has just been elected, and consists of the following artists:—MM. Cormon (president), Barrias, Jules Breton, Benjamin Constant, Busson, Raphael Collin, Dantan, Dawant, Farrier, Glaize, Guillemet, Harpignies, Henner, Humbert, J. P. Laurens, Levy, Renard, De Richmond, Boybet, Thirion, and Viobert. Up to the present 5,150 works of painting have been sent in, and to these must be added the works of those painters who, being *hors concours*, have the privilege of keeping back their pictures some days later. The jury will have to show itself unusually severe this year, for, owing to the demolition of a portion of the Palais de l'Industrie, the wall-space on the line is less than the available space of past years by over 1,000ft. This Salon will open on April 20 and will close on June 8. It is said that a picture by M. Jean Veber, whose work of last year attracted so much attention, has been adjudged by the jury, and is already causing much sensation; the artist represents M. Bismarck as a butcher, standing before a shop, in which may be seen quarters of flesh—human flesh! If this picture is hung it will certainly enjoy a deserved or undeserved success. The works of architecture for this Salon were sent in until the 29th. The jury of fourteen members will be elected on April 1 (the day preceding that on which these notes will appear in print).

The Société Nationale des Beaux-Arts has elected its juries for the various sections of the Salon of the Champ de Mars. Amongst the jury of painting are Sir E. Burne-Jones, MM. Frappa, Carolus Duvan, Sargent, Meissonier, Agache, and Bastien Lepage; in sculpture, MM. Baffier, Charpentier, Bodin, and Mlle. Claudel; in architecture and art objects, MM. Chaine, Benouville, Sauvageot, Gout, Bartholomé, Gervese, Puvion de Chavannes, Tony Noël, Dampé, &c.

M. Osiris has again promised to give a prize of £4,000 to the author of the most remarkable work at the Exposition of 1900. It may be remembered that the same gentleman gave a prize of £4,000 to the authors of the immense machine gallery of the Exposition of 1889.

A national exhibition of ceramic ware and all the *arts de feu* will be held at the Champ de Mars from May 15 to July 31, and will probably contain a large quantity of work of interest in architectural decoration.

The architectural portion of the new bridge Alexander III., now being constructed across the Seine in front of the Invalides, has been intrusted to MM. Cassien-Bernard and Cousin, architects, whose sketch designs are well advanced.

The Archaeological Congress of France will meet this year at Nîmes, from May 18 to 25. The principal historical monuments of the department and surrounding districts will be visited by the congress, and, as the country is very rich architecturally, the various excursions will be very interesting. Amongst the principal monuments to be visited are: The arena of Nîmes, the Château de Saint Privat, the curious fortified town of Aigues Mortes, the fountain and temple of Diana, and the monuments of Beaucaire, Tarascon, Arles, Avignon, and Orange.

The subject for competition for the foundation

Rougevin at the Ecole des Beaux-arts was a design for a carpet, one destined to cover the floor of a princely hall, woven and coloured regardless of expense. In order to prevent the imagination of the competitors from running away with their logic, the programme stated that "in the design of a carpet, whilst admitting great decorative richness, avoidance should be made of perspectives, figures, and drawings in relief or hollow; in a word, all that is contrary to the destination of a fabric which is used for walking on. The carpets of the East are logically designed and avoid such errors; they are veritable mosaic works of a wonderful richness of design and colour." The carpet should, however, not be Oriental in style, but essentially French, and the emblems, subjects of design, and attributes should be such as would be in harmony with the decoration of a hall of justice. The first prize was carried off by M. Naville for a design sown with fleur de lys, framed by a series of graceful geometrical designs surrounding a number of bold and flowing festoons of conventional acanthus, the whole artistically coloured, and the ensemble very harmonious.

The work of excavation and masonry for the foundations of the larger palace of the Champs Elysées has been adjudged to M. Chapelle, contractor, who submitted the greatest rebate of 31 per cent. on the price books of the Central Society of Architects.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Institute was held on Monday evening, the President, Professor GEORGE AITCHISON, A.R.A., occupying the chair.

##### HERALDRY OF THE RENAISSANCE IN ENGLAND.

An interesting lecture on the later English heraldry, regarded from its decorative aspect and illustrated by over sixty lantern slides, was delivered by Mr. J. ALFRED GOTCH, F.S.A. During the latter half of the 16th century and the earlier half of the 17th century there was, he pointed out, a general desire to make much of the antiquity and respectability of one's family, and one means of doing this was to display one's arms. When the posthumous granting of arms to persons who could have had no concern with them was considered, they would realise how far heraldry had travelled from its original starting-point three centuries before. From being matters of daily practical use, armorial bearings came to be what certain rudimentary organs of many animals were—a mere indication of particular ancestry, and so by implication a mark of gentility. The next stage was crystallisation. Rules were laid down which, instead of being guides, became goals; instead of fostering individuality, produced monotony. The origin of armorial bearings being forgotten, the application of them tended to become illogical, and heraldry gradually declined, both as a science and as a decorative art. The drawing became too realistic, and lost its proper conventional treatment; the bearings were depicted in the round instead of the flat. The 18th-century squires gradually fell out of their forefathers' habit of adorning their houses with heraldry. Heraldry, indeed, became little more than a matter of book-plates, and even these were threatened with extinction, since arms were granted which defied depiction. Another cause of deterioration in heraldic drawing arose directly from the change in the object of heraldry—namely, its becoming an indication of ancient descent. For one of the marks of ancient descent, and of great alliances, was to have many quarters to one's shield. This multiplication of quarterings not only tended to make the shield look fussy and confused, but it so reduced the scale of each coat as to render spirited drawing impossible. There was in the hall at Fawsley, in Northamptonshire, an achievement of the Knightleys, containing 334 quarters. But although the heraldry of the Renaissance contained within itself the germs of its own decay, it flourished vigorously enough. The designers of the time loved to avail themselves of it in all materials and in all connections. There was hardly a building of the period of Elizabeth and James that had not its owner's arms carved conspicuously upon it. The joiner and the plasterer were not behind the mason in using such excellent decorative *motifs* as heraldry afforded. Hundreds of elaborate chimneypieces exhibited as the focus of their splendour the owner's arms. The intricacies of a hundred ceilings encompassed the

same proud object. Scores of windows glowed with the colours of his achievement. As he gazed into the fire the flames lit up the same inspiring theme on the fireback, and the embers warmed at once his feet and his arms. The book which lay upon his knee bore on its leather cover still the same device, stamped in gold, or else inside, printed on a book-plate. The family animal surveyed mankind from the lofty pinnacles of the roof, or mounted guard on the newels of the staircase, or stood rampant in the ascending panels of its balustrade. To all uses, great and small, was the device of the family put, even to the most insignificant. But in no connection was heraldry more freely used than in tombs and monuments to the dead. Apart altogether from its decorative aspect, heraldry was useful in historical research. Many a clue was afforded by the presence of a shield or a badge in a building which had outlived its story, and many a sidelight was thrown on the process of research. Let them take the ninety shields on Rothwell Market-house, all bearing the arms of families connected with the county. Why did some of those shields appear? It was impossible to say; but the fact of their being there pointed to a connection with the county yet to be discovered. Of those ninety coats only half-a-dozen were still borne by residents in the county. The drawing of the charges on Rothwell Market-house was done with such vigour and grace as to be a pleasure to look at, apart altogether from the heraldic signification. The animals were fierce and wild and strong, and looked as if they had lived in the forest; and not like their descendants of a century or two later, which had become tamed and docile and fit to lie on the hearthrug. That was in the time of the Georges, when rules and regulations had broken their spirits. There were certain rules and regulations which had to be observed; but, within their limits, the more freedom the better; in fact, freedom was essential to decorative effect. The treatment of the usual adjuncts of the shield—namely, the helm resting on its upper edge, the crest and wreath on the helm, and the mantling forming, as it were, a background and frame—should be founded on logic, if not strictly logical; the crest and wreath should accompany the helmet, and not float in mid-air just above the shield. The mantling should be treated as a kind of cloth pugger, with two sides, which usually were of different colours. When supporters were introduced, they ought to stand upon something, and that something should be more substantial than the edge of the ribbon which displayed the motto. They should also look as though they were actually supporting the shield and helm, and doing it in a resolute and respectful manner. If the heraldry of the 16th and even 17th century was compared with that of the 18th or early 19th, it would be at once apparent how the draughtsmanship deteriorated, and how commonplace the drawing became. Heraldic drawing was not an easy matter: if it was to be revived, it must be done not by a mere copying of old examples and a departed style. The designer must be a skilful draughtsman, combining vigour of pencil with a strong feeling for anatomy, and he must steep himself in the subject, so that he had its rationale at his fingers' ends. But when he was properly equipped he would find few fields of design more attractive, or lending themselves in a greater degree to pure enjoyment of making lines express beauty and fancy and force. The lecturer concluded by exhibiting a large number of illustrations, including sheets from books in the possession of Heralds' College, 16th and 17th-century buildings in Northamptonshire and elsewhere, tombs, and impressions of seals, the whole forming a varied and exhaustive exposition of the subject.

Mr. J. M. BRYDON proposed a vote of thanks to the lecturer. This was seconded by Mr. W. H. ST. JOHN HOPE, F.S.A. (who, it will be recollected, read a paper on the earlier history of heraldry at the last meeting of the Institute a fortnight previously), and, having been supported by Mr. H. H. STATHAM and the President, was carried by acclamation. Mr. GOTCH briefly replied.

#### THE BUILDING TRADES EXHIBITION.

THE very successful Building Trades Exhibition at the Agricultural Hall was closed on Saturday evening, when Sir Arthur Arnold, late Chairman of the London County Council, distributed the prizes to the successful competitors



in the handicrafts competitions. Professor Benister Fletcher, J.P., F.R.I.B.A., presided, and said that 89 genuine working men had entered the competitions, or 100 per cent. more than competed at the exhibition of 1895. The competing workmen consisted of 24 joiners, 14 plumbers, 11 masons, 10 carpenters, nine bricklayers, seven painters, seven decorators, six plasterers, and only one smith, and these had worked for two hours on each of the preceding evenings in the galleries. The consultative council of the exhibition were of opinion that, inasmuch as the apprenticeship system was dying out, these competitions, which might be greatly extended in the future, would prove of the greatest value in the technical education of the workmen. That a desire existed for the obtaining of records of merit was shown by the fact that during the evenings of that week the competitors had worked ten hours without any pay. The verdict of the judges was that the work had been done well, but that the competitors were for the most part weak in technical knowledge. Special reference was made to the excellence of Mr. Shea's piece of smithing. Sir Arthur Arnold then distributed the prizes, and, on the motion of Mr. Charles Barry, F.S.A., a vote of thanks was passed to him and Lady Arnold for their attendance. In reply, Sir Arthur Arnold said he had to congratulate the promoters of the exhibition on the unqualified success of their venture. Such success, however, should not be surprising when the fact was borne in mind that the building trade was the largest industry in London, and more artisans were connected with it than with any other trade. With that trade, too, so much of the health and comfort of the people was bound up that it was most important that the workers should be intelligent men with a thorough knowledge of their business. He could imagine no better means of promoting that thorough knowledge than the competitions which had been conducted at that exhibition during the past week.

The following is the full list of prize-winners:—

**BRICKLAYING.**—(1) Mr. G. Purser, 108, Tyneham-road, Lavender-hill, Silver Medal of the Exhibition, with the Tylers' and Bricklayers' Company's Silver Medal, and Bronze Medal; (2) Mr. F. H. Smith, 70, Eland-road, Lavender-hill, Bronze Medal.

**CARPENTRYING.**—(1) Mr. A. Harrington, 33, Birnam-road, Tollington-road, Silver Medal of the Exhibition and Bronze Medal; (2) Mr. A. S. Sewell, 45, Howson-road, Brockley, Bronze Medal.

**DECORATING.**—(1) Mr. H. Harvey, Glenmore, Keynsham, Bristol, Silver Medal, technical work valued at two guineas, and Bronze Medal; (2) Mr. Herbert Danes, 131, Mayo-road, Willesden, Bronze Medal; (3) Mr. Percy Cable, 176, Malden-road, N.W., Certificate.

**JOINERY.**—(1) Mr. T. Pilgrim, 11, Durlston-road, Upper Clapton, two Silver Medals; (2) Mr. H. C. Williams, 21, Trafalgar-road, Old Kent-road, Bronze Medal; (3) Mr. H. J. Chapman, 18, St. James-road, Kingston-on-Thames, Bronze Medal; (4) Mr. J. Dormer, 40, Beadnell-road, Forest-hill, Certificate.

**MASONRY.**—(1) Mr. E. J. A. Burlington, 118, Crystal Palace-road, East Dulwich, two Silver Medals, and £1 for Messrs. Molesworth and Co., Ketton, Stamford; (2) Mr. A. J. Sproles, 3, Montefiore-street, Queen's-road, Battersea, two Bronze Medals, and 10s. for Messrs. Molesworth; (3) Mr. S. H. Gillingham, 25, Vassall-road, Brixton, certificate and 5s. Certificate also was awarded to the following:—Mr. J. P. Durston, 30, Combermere-road, Stockwell; Mr. A. Green, 12, West-square, Southwark; Mr. J. McKenzie, 20, Stanmore-street, Battersea; and Mr. A. F. Millicap, 43, Marney-road, Lavender Hill.

**PAINTING.**—(1) Mr. J. Young, 9, Henington-street, Battersea, Silver Medal, Bronze Medal, and two books; (2) Mr. G. Sisley, 3, Larkhall-lane, Clapham, Bronze Medal; (3) Mr. A. H. Mayhew, 17, Raydon-street, Dartmouth Park-hill, N., certificate.

**MODELLING.**—(1) Mr. R. Bussey, 13, Burnaby-street, Chelsea, Silver Medal and Bronze Medal; (2) Mr. T. J. M. White, 11, Jackson-road, Holloway, Bronze Medal.

**PLASTERING.**—(1) Mr. W. T. Drew, 63, Richmond-road, Islington, two Silver Medals; (2) Mr. G. J. Evans, 219, Essex-road, Islington, two Bronze Medals.

**PLUMBING.**—(1) Mr. G. H. Spears, 21, Richford-street, Shepherd's Bush, two Silver Medals; (2) Mr. H. Knowles, 7, Morland-road, Sutton, Surrey, two Bronze Medals; (3) Mr. P. Hartshorn, 21, Sloane-terrace, Chelsea, certificate.

**SMITHING.**—(1) Mr. G. Shea, 1, Walnut Tree-walk, Kennington-road, S.E., Silver Medal and Bronze Medal.

examiners were:—I. For Engineering as Applied to Municipal Work, A. M. Fowler, M.Inst.C.E. (past president); II. Building Construction, W. G. Laws, M.Inst.C.E. (past president); III. Sanitary Science, T. De Courcy Meade, M.Inst.C.E. (past president); and IV. Public Health Law, Chas. Jones, M.Inst.C.E. (past president). Mr. Laws was the superintending examiner.

The next examination will be held at Birmingham on the 1st and 2nd of October next, applications for which must be received by the Secretary on or before the 5th of September.

#### WARMING BUILDINGS BY HOT WATER.\*

THE third edition of this well-known treatise by Chas. Hood, F.R.S., F.R.A.S., rewritten by Mr. Frederick Dye, appears to be carefully revised and brought up to date. Heating by hot water has developed to so great an extent that any treatise on the subject must necessarily undergo revision at certain intervals, and this has been the case with Hood's treatise. Since the last edition many improvements have taken place, which have rendered a thorough revision necessary. Some of the chapters have been rewritten. Our readers who are acquainted with the former work and earlier editions will be able to judge for themselves the additions that have been made. The method introduced of late, the "one-pipe or simple-circuit" system, receives attention in Chapter XIX., a plan adapted for buildings of one or two floors of large area, where radiators can be distributed. One main pipe is used, and the radiators are connected with it, as shown by the isometrical diagram given in the text. Each radiator takes its share of the hot water, the circulation being continuous, and an equable warmth is diffused, the water in the first and last one in any circuit differing only about 15°. Speaking of the horizontal mains beneath the radiators, Mr. Dye remarks that if the floors are of concrete, the pipes must run along the ceilings beneath, cased from sight if necessary, though he seems to prefer, as indeed would be more efficacious, space on the floor above which is generally of wood. In the case of a large bank, the ground floor of which was occupied by clerks and offices, the main was run along the ceiling of the crypt below, and the boiler was placed on the basement below the crypt. This lower basement had the mains along the ceiling for the radiators in the crypt floor. When a space can be made between the floor and ceiling, it can be made use of for the main. He says also it is best to connect them from the top of the main, and shows how a radiator should be connected when out of the path of the main, which also allows for expansion and contraction of the main. Of course, in a two-floor building the water rises to the highest point of the system, and returns from it to the boiler; but all the connections are made to one pipe. Short circuit is impossible, as we find in the old two-pipe system, where one part of the circuit fails to give the required heat. Of course, expansion pipes are placed in the mains in the highest points of service, where the "flow" ends and the "return" begins. One rule is, that in all hot-water works "the pipe radiating surface or quantity of water should never be greater on the flow service than on the return." A plan of a small house is given, to show how the one-pipe system can be adopted, and how the radiators in the upper floor can be connected with the main in the basement. For a small house of this kind, the boiler can be placed in the basement below the dining-room. The old two-pipe system is pretty well known and is described. Several examples are given of these methods planned by the writer, and the diagrams of the different systems render the subject simple to any student. These examples of "low-pressure apparatus," showing the latest principles, are useful additions to the book, and the architect and student will find all particulars as to size of mains, branches, and radiator connections. The earlier chapters deal with the general principles of heat, water circulation, horticultural works, boilers, pipes and fittings, low-pressure systems. The chapter also on quantities for brick buildings, showing the application of Hood's rules, calculation of cubical capacities, coils, and radiators, warming by heated air,

\* Practical Treatise upon Warming Buildings by Hot Water, &c. By CHAS. HOOD, F.R.S.; rewritten by FREDERICK DYE. Third edition, fully revised. London: E. and F. N. Spon, Ltd., Strand.

chimneys, bath and lavatory apparatus, ventilation, &c., will be found serviceable. We may mention that Mr. Dye has contributed articles to our pages on some of these subjects. The treatise is well printed and fully illustrated.

#### STABLE CONSTRUCTION AND SANITATION.—VIII.\*

LIGHT.

A BUNDANCE of light as well as air is an absolute necessity for the promotion of robust health; but in many instances little attention is paid to this matter, no attempt apparently being made to secure the adequate lighting of ordinary stables and cow-houses. In addition to the unfavourable results which the absence of light produces upon the general health, it may be observed that in some cases the temperament of the animals is directly affected when confined for any length of time in a badly lighted building, and they are apt to be rendered somewhat morose and untractable in disposition.

It is within the experience of everyone that the sudden transition from the indistinct gloom of a dark building into full daylight produces a sense of blindness and indistinctness of vision which, for the time being, is both painful and alarming, whilst the surrounding objects assume most unnatural shapes. The same effect is produced upon horses when taken from an ill-lighted stable into the glaring sunlight outside. The sudden change and the unreal appearance of everything around frightens them, so that they become nervous and suspicious. Should these traits be developed in a great degree, such horses in time become what are commonly known as "shiers" or "starters," and the danger and discomfort of riding or driving animals of this description need not be commented upon. All stables should therefore be well lighted; but it is essential that there should be an entire absence of glare, so that the eyesight may not in any way be affected.

Where the lighting is obtained from windows in the front and back walls of the building, it should be so arranged that the greatest amount of

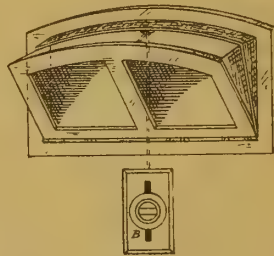


Fig. 53.

light enters at the rear of the horse. Stables having only a single row of stalls should be designed with a small window (having an area of about 1½ ft. superficial) at the centre of each stall, directly over the horse's head, together with a window at the rear, as shown in Fig. 37, or in some cases a large window may be placed behind every two horses. The windows at the rear of each stall should have an area of about 9 ft. superficial, whilst if large windows are placed behind every pair of stalls in lieu of the arrangement shown in Fig. 37, they should be large enough to admit not less than 18 ft. superficial of light. On sanitary grounds it is preferable that the windows be constructed of iron instead of wood, the former material being much more non-absorbent. A suitable window (size 3 ft. 3 in. by 1 ft. 5 in.) for placing at the head of each stall is shown in Fig. 53. The sash and frame are of iron, the sash being hinged at the bottom, and readily opened and closed by means of the small slide-bar B. A similar description of window (size 3 ft. 3 in. by 2 ft. 10 in.) for fixing at the rear of each stall is shown in Fig. 54. The upper half of the sash is made to open in the same manner, as already described.

The windows at the head of the stalls should be placed at least 8 ft. above the floor of the stable, whilst those at the rear should be 4 ft. 6 in. or 5 ft. above the floor level. If considered requisite, the window openings may be protected by means of wrought-iron bars built into the

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#### THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE 23rd voluntary pass examination of candidates for the offices of municipal engineers and surveyors to district councils, carried out by this association, was held at the Institution of Civil Engineers, Great George-street, Westminster, on Friday and Saturday, the 26th and 27th inst. Thirty-six candidates presented themselves for examination, the written portion of which was taken on the first day. The greater part of the second day was occupied with the *visu voce* portion of the examination. The



walls on the outside, or by the provision of external cast-iron gratings, as shown in Fig. 55.

For stables having two rows with an open roof, the principal portion of the light may be provided by means of a skylight constructed in the roof, as shown at A in Fig. 29; but under such circumstances care should be taken that the light is

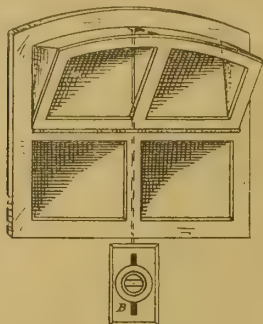


Fig. 54.

obtained from the north side of the building (or the side least exposed to the direct rays of the sun), so as to avoid any excess of heat or glare within. The top or roof-lighting should also be supplemented by means of a small window similar to that shown in Fig. 53, provided over the head of each horse at a height of 8ft. above the floor-level. Where a ceiling is provided, and the whole of the light must consequently be obtained from the side walls only, then, in double stables, the window over each stall should have a superficial area of not less than 9ft.

The lighting of cow-houses should be carried out in a similar manner to that already described for stables.

All windows should be made to open, so as to provide for any additional ventilation, and for thoroughly flushing the building with air, if necessary. By this means a valuable auxiliary to the ordinary ventilating appliances is available at any time. During that portion of the day when the stables are unoccupied, it is an excellent practice to open all the doors and windows, so that the whole of the internal air may be immediately and entirely renewed by perfilation—i.e., allowing the external air to blow freely through the open doors and windows of the building.

The sashes of stable windows may be hung on pivots, as shown in Fig. 56, if desired; but it is considered that the arrangement shown in Figs. 53 and 54 is preferable.

Fig. 57 shows a common form of ventilating window frequently used in farm stables and cow-houses of cheap construction. It is provided with what is known as a "hit-and-miss" ventilator for the admission of air. For buildings of this description the hit-and-miss ventilating windows are usually made of wood; but they can also be obtained in cast iron, if desired.

Where provision is made for lighting stables at night, every care must be taken that it is so arranged as to avoid any risk of fire occurring when in use. The safest and best artificial light that can be adopted is electricity. Such a means

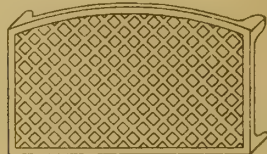


Fig. 55.

of lighting is available in most large towns and populous districts, whilst many country residences are now fitted with their own electrical installation. Provided that the wiring of the buildings is properly carried out, there is no danger either from fire or injury from the electric current.

Next to the electric light, gas is preferred. The lights should be entirely inclosed with glass, and provided with external wire-guards to prevent the lamps being accidentally damaged. The usual method of lighting stables with gas is

by means of wall-lamps or brackets. A sketch of a wall-lamp as ordinarily used is shown at Fig. 58. Sometimes the fittings are suspended from the ceiling, the pendants being provided with a swing or swivel top so as to fasten back in the daytime. Another arrangement consists in mounting the gas-lamps on the top of the stall or division posts.

Owing to the inflammable nature of such materials as hay, straw, &c.—small pieces of which are liable to be disturbed by restive horses—no naked lights should be permitted within the building. The gas-burners should not be placed nearer to the ceiling than 3ft. The service pipes should be of wrought-iron butt-welded tubing, and laid with a slight inclination towards the main, so that any moisture collecting therein may discharge into the main and eventually be collected in the siphon boxes.

Where electricity or gas is not available as an illuminant, oil or candles must be used. For this purpose wall-lamps, similar to that already shown in Fig. 58, may be provided. Another very convenient arrangement is illustrated in Fig. 59. An iron bearer, running the whole length of the stable, and supported from the ceiling by suitable brackets, is fixed a little to the rear of the stalls, as indicated at A, Fig. 37. The stable lamp is suspended from the bearer by a "carriage" or "runner," and designed to slide freely and easily from end to end of the building. The light can thus be brought immediately behind any of the stalls to suit the requirements of the moment, and adjusted to any desired height by means of the chain and balance-weight. The lamp is provided with a polished

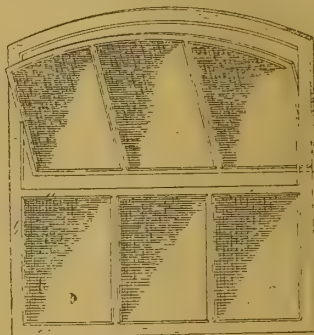


Fig. 56.

metal reflector, and the glass protected from injury by an iron wire guard. These lamps are obtainable fitted either with a reservoir for burning oil or a socket for holding a candle.

#### PAVING.

The paving of stables is a matter of great importance, inasmuch that it exercises considerable influence on the general welfare and comfort of the animals for whose use it is intended. A slippery, absorbent, and badly-laid floor is absolutely dangerous to the health and limbs of all the horses, cattle, &c., that may be required to walk or stand upon it for any length of time. To insure the utmost sanitary efficiency, not only must the material selected be thoroughly suitable for the purpose, but it is essential that it should be so laid that urine and any other waste liquids shall be readily drained from the entire surface of the floor, and at once removed outside the building.

A good stable-paving material must be non-absorbent, durable, sufficiently hard to withstand the roughest usage, smooth but not slippery, unaffected by acids, moisture, or variations of temperature, and easily cleaned. When laid, the whole surface must be perfectly watertight.

In order to comply as far as possible with these conditions, various materials have been recommended and used; but the great majority of them have failed—in one or more respects—to satisfy those requirements which are found necessary for the production of a hygienic and safe paving material.

At one time a most insanitary but common form of paving consisted of hard pebbles or rounded flints laid and bedded in sand. In floors of this description the joints between the pebbles and the layer of sand beneath eventually became saturated with decomposing urine and other foul liquids, giving off most objectionable and unwholesome vapours. To remedy in some measure

this defect, the pebbles were occasionally grouted in cement, but even then the resultant surface was of a most unsatisfactory character. From constant use the surface became very uneven,

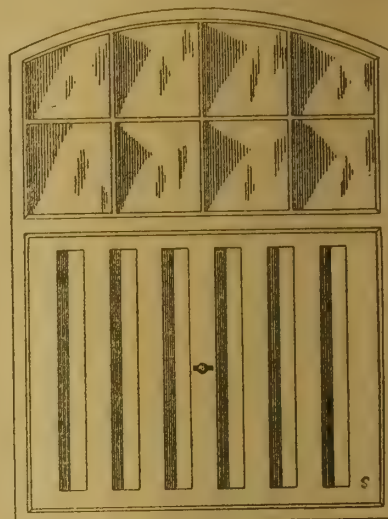


Fig. 57.

whilst the numerous and unequal joints did not admit of the paving being easily cleaned, and offered insuperable difficulties to the proper drainage of the building. In addition, the worn pebbles became very slippery and dangerous to walk upon. A stable paving of this class should, therefore, be entirely avoided.

Stone slabs or flags are sometimes used in districts where they are cheap and plentiful; but they cannot be considered as providing a suitable stable-paving material, as the surface becomes very slippery, and the slabs are liable to be broken or displaced under ordinary wear and tear.

Granite paving pitchers about 10in. by 4in. on the face, and 6in. deep, laid diagonally in parallel courses with proper falls on a concrete foundation, and bedded and closely jointed in cement, afford a very hard and durable surface, but is apt to become slippery with heavy and continuous use. The surface may, however, be roughened, and thereby greatly improved by forming slight diagonal channels about 8in. or 4in. apart, and arranging them to fall into the branch channel from each stall or loose-box. It is expensive in first cost; but in stables subject to constant, rough, and heavy wear it gives fairly satisfactory results when well set. Small granite cubes 4in. by 4in. by 4in. (sometimes known as "granite half-sovereigns") are also used for stable paving where much rough usage is anticipated; but, owing to the numerous joints, the surface is not readily drained, and the general result is inferior to that of the granite pitcher paving previously mentioned.

Asphalte is another material that has been used for stable floors. The surface is non-absorbent, durable, and easily cleaned; but it is much too

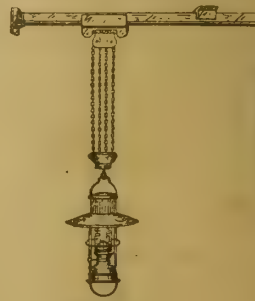


Fig. 59.

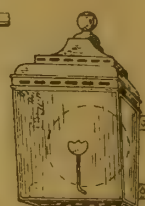


Fig. 58.

slippery to be used with safety for such a purpose.

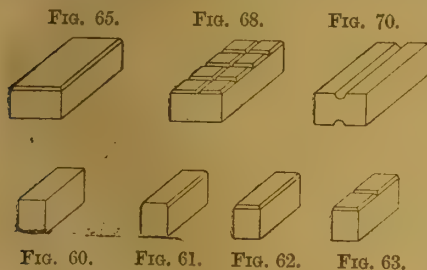
Within recent years there has been introduced a composite material containing a large proportion of asphalte or bitumen, and known as "cork pavement." It consists of finely granulated cork, thoroughly incorporated with bitumen, and compressed into bricks. In this admixture, the slipperiness which is the great defect of asphalte when used alone is entirely obviated, and a



secure foothold is obtained by this means. After complete immersion in water for ten days, the material showed no appreciable increase in weight or bulk. It is therefore much more non-absorbent than many of the varieties of bricks which are commonly used for stable paving. The cork bricks require to be laid to proper falls on a concrete substructure, and bedded and jointed in the bituminous material specially prepared and sold for the purpose. The pavement is practically impervious to moisture, not slippery, and for stables where noiselessness is of paramount importance, it may be used with advantage.

Wood-block paving has sometimes been used in stables. It affords a good foothold to the horses, and is comparatively noiseless; but the porous nature of the material is a most serious defect. Even when thoroughly creosoted timber is used, the wood-blocks are much too absorbent to be considered as providing a sanitary form of stable paving. The urine and other waste liquids, instead of flowing freely from the surface of the floor, are in a great measure absorbed by the blocks themselves until the whole of the paving becomes saturated. The result is that the air of the stable never smells pure and wholesome, but is always more or less tainted by the ammoniacal and other hurtful vapours given off from the decomposing organic matters retained in the pores of the wood. Paving material of this description is, therefore, quite unsuited for such confined situations as the interior of stables, but it may sometimes be used with advantage for stable-yards and other places where it would be constantly subject to the ameliorating influences of the open air.

The blocks may be laid in the same manner as usually adopted for paving public streets. The foundation should consist of Portland cement concrete 6in. thick, laid on a 6in. bed of hard, dry, broken bricks which have been previously well rammed. The creosoted blocks are then



placed endwise of the grain with a space of  $\frac{1}{4}$  in. between the courses and  $\frac{3}{4}$  in. between the blocks, and the joints grouted with a mixture of creosote and pitch. For stable-yards, &c., of large area, expansion joints about one inch wide should be provided at intervals to allow for the swelling or expansion of the wood, the space being afterwards filled in with the grouting mixture.

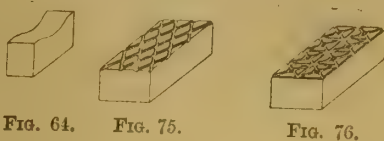
Sometimes the wood blocks are laid on an asphalt bed about half an inch thick, and resting on the concrete foundation, the whole floor being then well grouted in with asphalt, or cement and sand.

Bricks made from various descriptions of clay are much used for stable paving. These vary considerably in size, form, and degree of impermeability. For farm stables in country districts, especially selected hard common bricks are sometimes used. The general result is, however, unsatisfactory, for they are very porous, and under constant wear the surface becomes most uneven.

A small variety of brick known as *Dutch clinkers* were at one time imported from Holland, and almost universally used for stable paving. They are of a dull yellow colour, very hard, the material being thoroughly vitrified, and wear with a rough surface; but they have now been superseded in England by a similar description of brick known as *adamantine clinkers*. These bricks are of a bright yellow or pink colour, whilst at the same time they are harder, heavier, and of a more regular shape than Dutch clinkers. They can be procured with sharp arrises, as in Fig. 60, or with chamfered edges, as in Figs. 61 and 62, the two latter being designed to give a more secure foothold. The form of brick shown at Fig. 63 is also designed for the same purpose, and is known as a "double-panel chamfered clinker." Fig. 64 shows a channel brick which is greatly used in connection with the paving bricks just mentioned.

Another similar description of brick pavior—known as "terro-metallic clinkers"—may also be obtained; they are made of the same shape and size as adamantine clinkers, but are almost black in colour.

Staffordshire blue-paving bricks are largely used for the floors of stables. The upper edges are

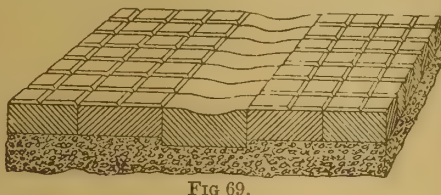


usually chamfered, as in Fig. 65, so as to provide a better foothold, or else the surface is further divided into a series of panels by means of V or U-shaped flutes or channels. (See Figs. 66, 67, and 68.) Bricks of this description, when of good quality, are extremely hard and durable, and absorb but little moisture.

In the selection of bricks suitable for stable



paving, it is important to remember that in all cases where indentations or grooves are formed on the surface for the purpose of affording a grip to the feet, and to prevent any sense of slipperiness whilst horses are walking or standing upon them, it is also necessary, for thorough sanitary efficiency, that all such grooves should fall towards the main channels provided for the removal of refuse liquids. It will be observed that floors formed with many of the bricks mentioned, not only have longitudinal channels, but also a large number of transverse channels (as indicated in Fig. 69). Such surfaces are consequently most difficult to keep clean, for the



transverse channels become blocked with dirt and other *débris*, which is eventually completely saturated with urine. Even with a broom and large quantities of water it is not practicable to thoroughly clean the grooves, as it will be found on sweeping the floor in the direction of one set of grooves that the other set of transverse channels provide a lodgment for the dirt, and which cannot be entirely removed by the broom. In addition to this defect, the joints between the bricks are, as a rule, formed in the grooves, so that unless the joints remain perfectly water-tight, there is a constant risk of the liquid refuse soaking into the substructure of the floor.

The form of brick shown in Figs. 70 and 71 overcomes these objections in a great measure. They are provided with one or two U-shaped

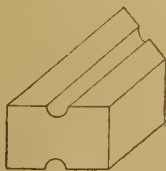


Fig. 72.

grooves, so that when laid the surface is intersected by a series of longitudinal grooves falling towards the main channel. The greater portion of the joints between the bricks being also on a higher level than the channels, there is not the same tendency for liquids to soak into the joints. Bricks similar to Fig. 70 may be obtained of a deep brown or blue-black colour, whilst the "Olympia" paving bricks (of which Fig. 71 is a

sketch) are light brown or buff in colour. Specially-made splay bricks (see Fig. 72) are also obtained when it is required to lay the branch channels at an angle with the main channel. By this means any cutting or waste at the junction is avoided.

#### ELECTRIC LIFTS AND CRANES.

AT the ordinary meeting, on Tuesday, of the Institution of Civil Engineers, the paper read was on "Electric Lifts and Cranes," by Mr. Henry W. Ravenshaw, Assoc.M.Inst.C.E. This communication referred to the application of the electric motor to the working of lifts and cranes. Where hydraulic power was available, its simplicity afforded many advantages, although in the ordinary form of hydraulic motor as great an amount of water was used with a light load as with a heavy one. The electric motor, however, only absorbed current in proportion to the work developed, and this fact alone justified its application in certain cases. The chief requirements of the motor were sparkless commutation, self-adjusting brushes, and automatic lubrication. Shunt machines were generally used on account of their regular speed with varying loads; a few turns of series-winding were, however, sometimes added to give prompt starting. Worm-gearing was employed, and gave compactness and silent running, with a quick pitch for the worm; ball-bearings and an oil-bath were recommended. To give good results, the ball-races must be of high-class steel, and be ground perfectly true after hardening. The regulating-gear should provide prompt and accurate control, absence of jerks, small current consumption, and regular speed. Resistance was necessary in the circuit of the motor at starting to prevent a great rush of current; and this should be controlled automatically, as it was impossible for the attendant to tell the position of the switch when a hand-rope was used. The automatic controller used by the Otis Company was described, as well as an arrangement controlled by a centrifugal governor, which had been designed and used by the author. Magnetic brakes were advocated, the cage being automatically stopped when the current was accidentally broken. The magnet should be fitted with non-conductive resistances, to prevent sparking on breaking the circuit. Tests of an Otis elevator and a curve showing the energy consumed under varying loads were given, the cost per return trip with four persons to a height of 36.5ft. being 0.101d. at 4d. per Board of Trade unit. The cost of an average trip with two persons to a height of 24.75ft. was 0.066d. at 4d. per unit. Electric cranes presented several marked advantages over those driven mechanically, owing to the flexibility of the control of the motor and the simplicity of the conductors for transmitting the power. The relative advantages of the use of a separate motor for each motion, and of a single motor and friction-clutches were discussed, the mechanical simplicity in the one case, and the electrical simplicity in the other, enabling either system to be used with good result. Tests were given of a 20-ton electric crane at Woolwich Arsenal, arranged on the single-motor principle, friction-clutches being used to actuate the various movements. The collectors for the current, with the method used for insulating them, were described. Owing to the special requirements of this crane much gearing was necessary, and a heavy chain-block weighing nearly two tons was fitted. The efficiency was thus reduced, especially at light loads, and the horsepower delivered to the load, as well as that delivered to the block, was given, to enable the mechanical losses to be more readily obtained. A total efficiency of 53.42 per cent. was obtained when the load on the hook only was considered, and of 58.28 per cent. when the weight of the block was included in the load. To drive the outer carriage at the rate of 54ft. per minute 8.4E.H.P. was required, and 10.2E.H.P. to traverse the load radially at the rate of 32.4ft. per minute, both with a load of 20 tons. The paper was illustrated by drawings of the lifts and cranes described.

The technical instruction committee of the corporation of Hull have adopted a resolution asking the council to confirm the purchase of the Park-street Orphan Home as a site for the technical school for the sum of £6,500, and to borrow a sum not exceeding £15,000 for such purpose and making the necessary alterations.



## OBITUARY.

THE death is announced of Mr. THOMAS ALEXIS DASH, late land surveyor to her Majesty's Office of Works, a position he held for 30 years. During his tenure of office the Kennington, Victoria, and Battersea Parks were acquired and laid out by the Government, and the sites of the Royal Courts of Justice and sites for many other Government offices in London and the country were purchased, the surveying and other work incidental to the proceedings in Parliament for the obtaining of the necessary compulsory powers being carried out under his supervision. Amongst other matters, the land surveying in connection with various alterations from time to time in the Royal parks and gardens, and with record plans relating to their boundaries, freeboards, and so forth, fell within his province. Having attained his maximum number of years' service at the Office of Works, he retired in the latter part of 1887. He has since lived at Byfleet and Woodham, near Weybridge, Surrey. He was 70 years of age.

MR. FRANCIS WILLIAM CROSSLEY died at Ancoats, Manchester, on Friday, in his 58th year. Mr. Crossley when a boy was apprenticed to the Armstrong engineering firm at Elswick, Newcastle-on-Tyne. While still a young man he went, with his brother William, to Manchester, and they began business together on quite a small scale. Having bought the home and colonial rights of the Otto gas-engine patent, they soon established a great business. During the last 15 years Mr. Crossley has taken a very prominent part in many kinds of philanthropic work, and especially such as had a religious bearing. He was widely known for his great and practical interest in home mission work. He was a vice-president of the United Kingdom Alliance. Though much occupied with the cares of a great business and large social schemes, Mr. Crossley found much time for the study of literature and art, and was a man of wide reading and culture. He was a strong Liberal in politics.

THE death is announced, at the age of 54 years, of Mr. WILLIAM HUNT, M.Inst.C.E., the chief engineer of the Lancashire and Yorkshire Railway Company. Mr. Hunt, who died on Monday, only returned to Manchester on Friday from London, where he had been giving evidence on behalf of his railway company's Bill. He had been chief engineer of the railway since 1882, after acting as chief assistant engineer during the previous six years. Under his direction the company has carried out most extensive works, involving an expenditure of £8,000,000. These included the doubling of the line from Sandhills to Liverpool, and the construction of the new Exchange Station there; the construction of the Pendleton and Hindley line, forming a new and direct Lancashire and Yorkshire route to Liverpool; the making of new goods and passenger-stations at Bradford; and numerous widenings of the lines in the neighbourhood of Manchester.

MR. GEORGE MILLER CUNNINGHAM, C.E., of Leithenhop, Peebleshire, who had been in failing health for the last two or three years, died on Thursday in last week, in Edinburgh. He received his early training in the office of Messrs. Miller and Grainger, Edinburgh, a firm which was connected with the carrying out of most of the main lines of railway in Scotland between 1840 and 1850. Subsequently he began business in partnership with Mr. George C. Bruce, but on the death of Mr. Benjamin Hall Blyth, of the original firm of B. and E. Blyth, he joined Mr. Edward Blyth under the style of Messrs. Blyth and Cunningham, and that partnership, in addition to carrying out a great many of the most important railway works in Scotland, were for many years associated with most of the works of the Caledonian Railway Company, for whom they acted as consulting engineers. Latterly the firm became Messrs. Cunningham, Blyth, and Westland. In November last Mr. Cunningham retired. During his career he had probably the largest business in Scotland as an arbiter in connection with public works, and was very largely employed in Parliamentary work relative to schemes in Scotland as well as in England. He leaves a widow and grown-up family.

THE death is announced of Mr. WILLIAM HALSEY WOOD, of Newark, N.J., an architect of much force and individuality. Unfortunately, says the *American Architect*, success in securing

commissions came to him early in life, and he yielded too much to the then current desire to create an "American style," and carried out much of his work in a spirit of fantastic exuberance which resulted in buildings that hardly do justice to his real powers. Born in 1855, Mr. Wood was trained in the office of Mr. T. A. Roberts, with whom, later, he formed a partnership under the title of Roberts, Taylor, and Wood, which did not endure long. After its dissolution Mr. Wood practised alone. Besides the notable, but peculiar, Peddie Memorial Church at Newark, he built in New York City the churches of All Angels, Zion, and St. Timothy Church of the Redeemer and St. Matthew's. Other churches were built in Chattanooga, Tenn., Anniston, Ala., Newark, N.J., and other New Jersey towns. His most notable achievement was an unsuccessful design which he prepared for the Cathedral of St. John the Divine. A more elaborate and costly set of competition drawings was probably never made. Mr. Wood carried out a large amount of costly domestic and public work, amongst other buildings being the Carnegie Library Building, at Braddock, Pa.

## CHIPS.

A new church for St. Paul's United Presbyterian congregation, which has been erected at Rosemount Viaduct, Aberdeen, was formally opened on Friday. The cost of the building has been £4,750.

A field nine acres in extent has been presented to the Corporation of Newport, Isle of Wight, for use as a recreation ground.

There has recently been an arbitration between Mr. Joseph Handley, of Rochdale and Southport, as part owner and trustee, together with Mr. S. Mills, his co-trustee, on the one hand, and the Manchester Corporation on the other, as to the amount to be paid by the latter for property required for street improvements. The arbitrators could not agree, and we understand that the umpire has awarded to the co-trustees about £13,500. It was expected that the award would be for £18,000 or £20,000.

A new infectious diseases hospital for Bristol at Ham Green is rapidly approaching completion. The building, which is being erected from the designs of Mr. Yabbicom, borough engineer, of Bristol, consists of four wards and an isolation ward, each ward being a separate building, with a space of 40ft. between each. There will be 17 beds in each of the four wards, while the isolation ward is divided into four apartments with two beds to each. The Ham Green mansion is being fitted up to serve as the headquarters, with accommodation for the resident doctor and staff of nurses, attendants, &c. The total cost will be about £27,000.

A special meeting of the Morpeth Rural District Council was held on Friday for the purpose of electing a road surveyor in succession to Mr. Dixon, resigned. There were 79 applicants. Mr. W. Gibson, Redgordon, Perthshire, was elected by a large majority.

A public free library is about to be given to the parish of St. George just outside Bristol, by Sir W. H. Wills. Mr. Frank Wills, of Bristol, is the architect, and Mr. Frank Cowlin, of the same city, the contractor, and the cost will be about \$6,000. The buildings will cover an area of 70ft. by 78ft. frontage, and will be faced with local bricks and Ham Hill stone dressings.

The builders at Coventry are endeavouring to meet the great demand for new dwellings caused by the rapid increase in the population of the city. At the council meeting on Tuesday, plans were presented for approval for 46 houses in Melville-road, and for 39 houses in Ellys-road.

The Grand Spa and Hydro, at Clifton, near Bristol, will be opened about the middle of June. It is being erected in accordance with designs by Mr. Croydon Marks, A.M.I.C.E., M.I.M.E. Provision is being made in the hotel for 100 bedrooms.

By a casting vote the urban district council have decided to accept the tender of Mr. J. C. Lang, of Liskeard, at £7,318 1s. 7d. for carrying out sewage works from specifications prepared by Mr. James Mnasergh, C.E. There was one lower tender received, that of Messrs. H. and D. Parfitt, of Newport, Mon., at £7,272 1s. 8d., and seven higher ones, the members being almost equally divided in choice between the two lowest.

The Northumberland County Council Asylum Committee have instructed Mr. D. Balfour, M.Inst.C.E., of Newcastle, to prepare plans and report on a gravitation scheme of water supply for the County Asylum at Morpeth, to be procured from Upland Springs, six miles north of Morpeth, and delivered into an elevation tower for distribution.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The members of the Architectural Association of Ireland gave their first conversazione in the Royal Hibernian Academy House, Lower Abbey-street, Dublin, on Tuesday evening. The fact that the pictures which form this year's exhibition were still on view, added an entertaining and instructive feature to the provision made for the guests, and rendered all the more graceful the Academy council's action in lending the house for the function. The principal hall was furnished and decorated with a view both to comfort and to effect; couches were conveniently placed throughout, while easy-chairs distributed over the greater part of the central space enabled groups to enjoy the social intercourse, admire the paintings which hung all round, or listen with pleasure to the various items of a musical programme. At intervals between the songs and instrumental selections opportunities were taken of visiting the adjoining sections of the exhibition. The principal guests were received by Mr. Caulfield Orpen, president of the association; the hon. secs., Messrs. W. R. Gleave and R. M. Butler; and other members of the committee. Tea and other light refreshments were served during the evening in a portion of the Sculpture Gallery.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this association visited, on Saturday afternoon, Hatton House, Midlothian, by permission of the proprietor, the Earl of Morton, and the tenant, Mr. James M'Kelvie, under the leadership of Mr. Thomas Ross, F.S.A. The house has a massive central keep, with later additions round it. In the time of Robert II. John de Haltoun was proprietor, and in a few years it passed to the Lauder family, the Lauders of the Bass, in whose hands it remained for several centuries. The Lauder family were implicated in the assassination of the Earl of Douglas, and incurred the deep resentment of that powerful family, who captured the keep, but were ousted by the timely assistance of the king, who sent the "great bombard," supposed to be Mons Meg, to the help of the Lauders, who, again obtaining possession, were permitted to re-edify the keep. Early in the 17th century, Charles Maitland, brother of the Earl of Lauderdale, and a well-known officer of State in Scotland, became proprietor, and began the extensive additions of which much remains. To a certain extent, he copied his brother's manner of laying out the gardens at Ham, and the work, which was carried on by his successor, had made the house, with its gardens, terraces, sundials, and statuary, one of the most interesting and pleasant in its own part of the country. Mr. Ross expressed his indebtedness for many of his descriptive and historical notes to Mr. J. R. Findlay, at one time tenant of Hatton, and who prepared an interesting monograph. On the motion of Dr. Rowand Anderson, a vote of thanks was awarded to the proprietor and to the tenant for permitting the visit, and to Mr. Ross for conducting the party.

Messrs. Street and Co., advertising agents, of 30, Cornhill, E.C., and 5, Serle-street, W.C., announce that they will open, on Monday, 5th April, 1897, a branch establishment at 164, Piccadilly, London, W.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied their patent warm-air ventilating Manchester grates to the Upton Asylum, Chester.

A new cottage hospital is being erected at Newton Abbot, and special consideration has been given to the ventilation, which will be effected on the Boyle system.

The new post-office in Bishop-street, Rothesay, was formally opened by the Marquis of Bute, as provost of the borough, last week. The building is Classic in style, and has cost £4,000. The building contractor was Mr. W. W. Oswald, of Skelmorlie.

The Chancellor of the Diocese of London held an adjourned Court at St. Paul's Cathedral, on Tuesday, to hear the application of the rector and churchwardens for a faculty to remove the galleries of St. George's, Campden Hill. The application was opposed by the trustees, on the ground that there were not sufficient funds in hand. In giving his decision, the Chancellor said the removal of the galleries would lighten and improve the church; but the faculty would not issue until he was satisfied that a sufficient sum was in hand to effect the removal of the gallery and the cleaning of the church. A second faculty would be granted on the same conditions for the alteration of the windows.



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THE MILLENNIAL EXHIBITION BUILDINGS AT BUDA-PEST.—STAIRCASE IN AN OLD HOUSE AT LANCASTER.—HOUSE AT SLOUGH.—SCHOOLS AT HIGHER BROUGHTON, MANCHESTER.—PROPOSED COUNTRY HOUSE IN NORTH DEVON.—DRAWING-ROOM OF A HOUSE NEAR GODALMING.—PROPOSED BANK, DISTRICT COUNCIL OFFICES, AND MARKET HALL, GREAT HARWOOD.—NEW PIGGERIES AND STABLES FOR HARROD'S STORES, LTD.—SIXTEENTH-CENTURY ITALIAN CASSONE AND FOLDING CHAIR.

## Our Illustrations.

THE MILLENNIAL EXHIBITION BUILDINGS, BUDA-PEST.

MR. IGNACZ ALPAR, the architect of the remarkable series of historically representative buildings erected by the Government at Buda-Pest, has contributed a set of photographs to the BUILDING NEWS, in illustration of his designs as executed. We publish to-day two views of the large Renaissance pavilion, and at an early date propose to give others of the Mediæval buildings erected in the same grounds. For thoroughness and care in items of detail, few if any undertakings of the kind have ever surpassed these works of Mr. Ignác Alpar, of Buda-Pest.

## STAIRCASE IN OLD HOUSE AT LANCASTER.

THIS staircase is in a house which is said to have formerly been a town residence of the Earls of Sefton. Up to 1895 it was an hotel, known as the Commercial, but now has been converted into municipal offices. When the drawing was made it was thought the whole building was to be pulled down and new offices erected. The lower portion of staircase up to first floor has been removed, the upper portion remaining.

CHARLES B. PEARSON.

## HOUSE AT SLOUGH.

THIS house was built a short time since by Mr. Charles Simmons, of Slough, Bucks. The materials used are local red bricks, the first floor finished in rough-cast, and the roof covered with dark Broseley tiles. Mr. Henry A. Crouch is the architect.

## ST. JOHN'S CHURCH SCHOOLS, HIGHER BROUGHTON, MANCHESTER.

THESE schools have been erected during the past twelvemonths in place of the old buildings, which were altogether inadequate. They comprise classrooms and a large central hall, 75ft. by 40ft., with open-timbered roof and with platform at one end, as it is proposed to utilise the room for public and parish meetings. A small portion of the old schools is retained to serve as class-rooms. The whole of the buildings are of picked common bricks with terracotta and stone dressings. Messrs. Wm. Brown and Son were the contractors at a total cost of £1,505. The architect is Mr. W. S. Ogden, who also restored and enlarged the church in 1893.

## COUNTRY HOUSE, NORTH DEVON.

THIS house was designed by Mr. H. Seton Morris for a picturesque site near Barnstaple, North

Devon. The end wall of a house at present on the site is on the same face as the main road walling, and this feature will form part of the drawing-room wing to the new house. The building is to be of local stone with Monk's Park stone dressings; the roof will be covered with Broseley tiles, the hall and dining-room will be panelled with fumigated oak, whilst the whole of the woodwork in the drawing-room will be painted ivory white to form an effective contrast to the rest of the house.

## DRAWING-ROOM OF HOUSE NEAR GODALMING.

THIS is an illustration of the drawing-room of a little house about to be built near Godalming, Surrey. The woodwork throughout will be of the severest description, with as few mouldings as possible. The jambs of the fireplace will be inlaid with a simple design in three stained woods; the rest of the woodwork will be of deal stained green. (The overmantel will be omitted in the actual work, also the carved panel to the door.) The walls are intended to be distempered yellow, with a frieze in coloured plaster of a rambling briar-rose; the floor to be of oak and pitchpine in alternate narrow widths. Mr. Seton Morris is the architect.

## BUILDINGS FOR THE MANCHESTER AND COUNTY BANK, LIMITED, AND DISTRICT COUNCIL OFFICES AND MARKET HALL FOR THE GREAT HARWOOD URBAN DISTRICT COUNCIL.

THE Urban District Council of Great Harwood intend to develop a piece of ground in the centre of the town by the erection of district council offices and a market hall. The remainder of the site will be occupied by premises for the Manchester and County Banking Co., Limited. The open space round which the buildings are grouped is intended to be used as an uncovered market. The whole of the buildings will be faced externally with Yorkshire parpoints (in order to keep down the outlay) and ashlar dressings, and the roofs covered with green slates. Working drawings are in hand for the Bank and Council Offices, and the Market will be erected at a later date. The plans have been somewhat revised, as now shown, since the view was made. The approximate estimate for the various works is as follows:—District council offices, £4,500; market hall, £2,500, and bank £3,500. The architects are Messrs. Briggs and Wolstenholme, of Blackburn and Liverpool.

## NEW STABLES AND PIGGERIES AT BARNES, SURREY, FOR HARROD'S STORES, LIMITED.

THESE buildings abut upon the river just below Hammersmith Bridge, a full front view being obtained from towing-path or river when going from Putney to Hammersmith. The stable buildings provide accommodation for over 100 horses, including 84 stalls and 23 loose and sick boxes (with a south aspect), harness-rooms, &c. The piggery building accommodates a very large and varying number of pigs, with boiling, mixing, and slaughter-houses complete. The upper portions of the blocks are used as dwellings for the housekeepers, &c. There is a water-tower over the centre block, containing a tank of 3,000 gallons capacity. The whole of the elevations are faced with alternate four courses of red and white bricks, the interior faces of walls in stables are faced with duck-green tiles throughout, and the upper portion of boxes with white glazed bricks, the lower 3ft. being faced with blue Staffordshire bricks; the whole of the flooring material throughout stables and piggery is granite. The works have been carried out by Messrs. Harrod's Stores' own staff of workmen under their foreman, Mr. Roberts, and the superintendence of the architect, Mr. William G. Hunt, of 2, Norwood-place, Kensington.

## ITALIAN CASSONE AND CHAIR OF THE SIXTEENTH CENTURY.

THESE two pieces of furniture form the subjects of a sheet of sketches reproduced on another page. The "cassone" or coffer differs from the more usual type, inasmuch as this one is of grand dimensions, and is furnished with elbow rests and high back—indeed, unites the uses of a bench with that of a chest. Cassoni were conspicuous objects in the halls and corridors of the great Italian Palaces, and in them were stored the tapestries and other rich hangings when not in use. Sometimes these chests were of the most elaborate description, and were given to brides as part of their dowry, to hold the bridal trousseaux, and were in this case fitted with small drawers and conve-

niences for storing personal ornaments. Exalted brides frequently had their wedding coffers painted by artists celebrated for this class of work; the decoration was not uncommonly modelled in plaster and then gilt. They were mostly in the form of a sarcophagus, and stood, as does the subject we have chosen, on claws. This one is over 6ft. long, and is in the National Museum at Florence.—The Folding Chair, from the art collections at South Kensington, is an exceedingly fine specimen of the curule form. The shaping of the back and the disposition of the shield of arms and carving being fine expressions of 16th-century skill in design and workmanship. It is carved in oak, and so constructed as to admit of its being taken to pieces and packed for travelling.

## CHIPS.

The Corporation of Southampton have decided to raise the salary of their highway surveyor, Mr. Johns, who was appointed only a few months since, from £160 to £200 a year. Mr. Johns was applying for a situation under the Corporation of Croydon at a salary of £350.

The Swiss Federal Council proposes to purchase all the principal railways in the country. The operation is expected to entail an outlay of over £38,000,000, and the money is to be raised by a 60 years' loan.

The markets committee of the corporation of Wolverhampton have under consideration an extensive scheme for improving the cattle market, the market hall, and the wholesale market, at a cost of about £7,000.

The Litherland Urban District Council having applied to the Local Government Board for power to borrow £800 for the widening of Linacre-road, Mr. W. O. E. Meade King, M.I.C.E., conducted a public inquiry at Litherland on Friday.

At a meeting held at Swansea last week it was reported that £14,000 had been collected, which would cover the cost of the first section of the restoration of the parish church, now nearly completed. It was decided to proceed with the second section, dealing with chancel and tower, and, towards the estimated cost of £10,000 required, about £350 was promised in the room.

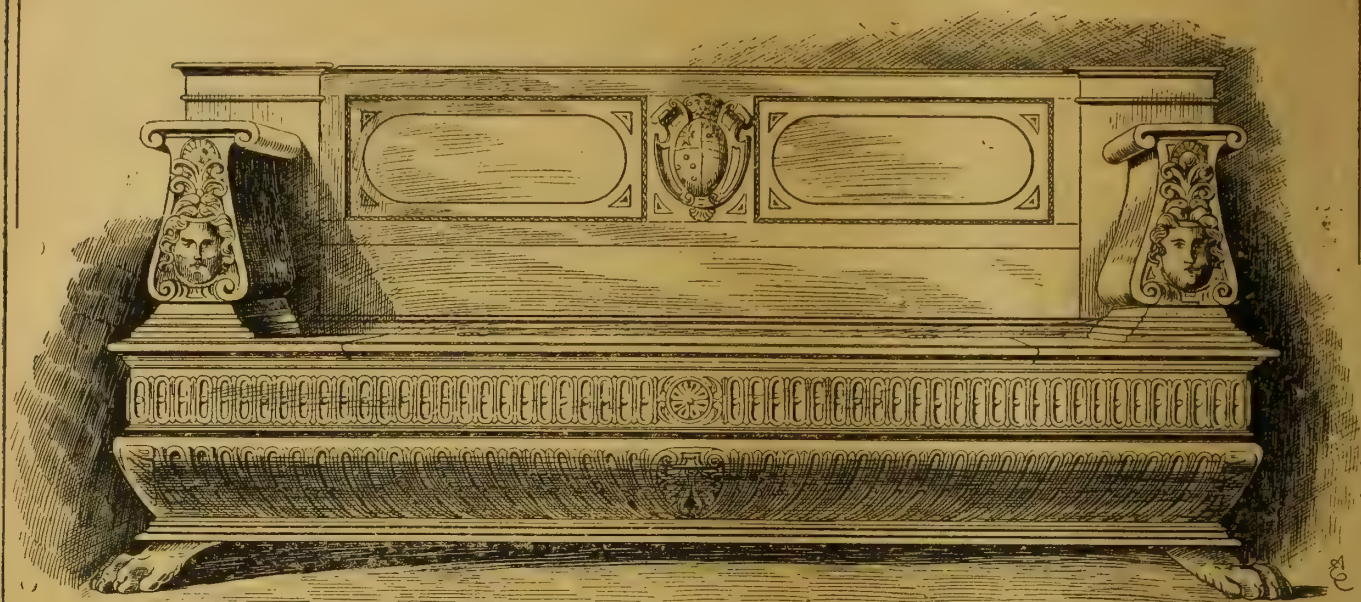
During the past six months the North British Railway Co. have spent not less than £95,910 on the works at their Waverley Station at Edinburgh, and on the widening of the lines thereto. In the future a further sum of £888,840 is to be spent on those costly works, the greatest that the North British Railway has in hand at present.

The Salford School Board have decided to build a new school in London-street to provide accommodation for about 300 girls and 350 infants, and to be built in such a way as to be capable of enlargement, and that it be an instruction to the architect, Mr. Henry Lord, that the school be built at a cost not exceeding £6 per head without a central hall, and £7 with a central hall. It was further agreed that a public elementary school of three departments, to provide accommodation for about 1,200 children, be built on the Seedley site; and that the architect be selected after a limited competition.

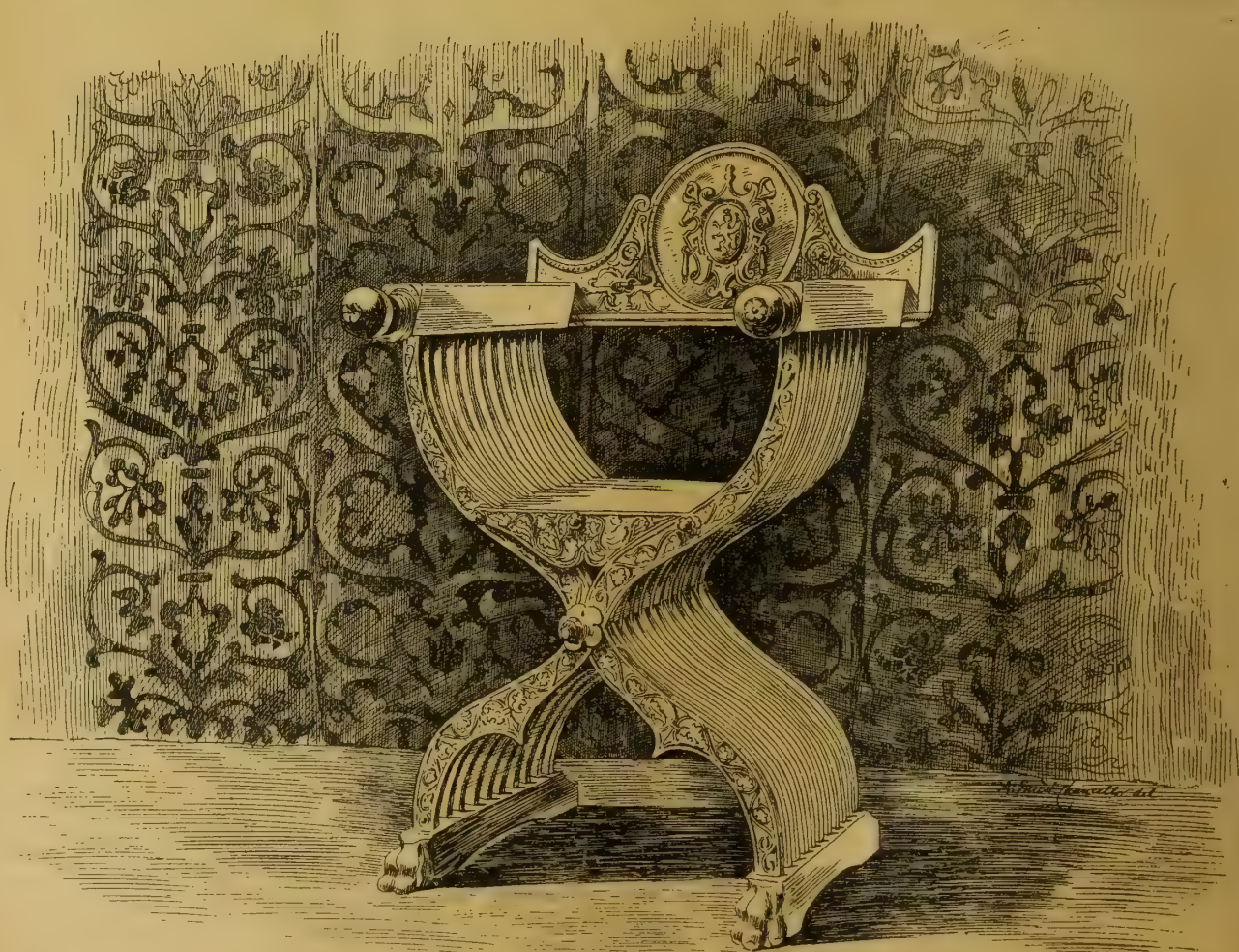
At the last meeting of the Manchester Corporation a number of increases of salary were granted. The salary of Mr. William Wilson, building inspector in the central district, was raised from £163 16s. to £173 16s. per annum, and those of Mr. Richard Hall, surveyor for the central district, from £295 to £320 per annum; Mr. Henry Chenery, surveyor for the southern district, from £270 to £295 per annum; Mr. T. A. Lomas, surveyor for the northern district, from £270 to £295 per annum. In the city surveyor's department, Mr. F. J. Edge, principal engineering assistant, from £250 to £270 per annum; and Mr. G. M. Moyes, improvement and buildings surveyor, from £325 to £350 per annum.

A reredos to the memory of the late Mr. R. J. Johnson, F.S.A., F.R.I.B.A., designed by himself, has lately been erected in the parish church of St. Matthew's, Newcastle-on-Tyne. Mr. Johnson was the architect of the church, and the reredos has been given in his memory by his widow and their friends. The reredos is of Caen stone, consisting of a large central crucifix with saints and angels in niches all round it, and surmounted by a crowned and seated figure of our Lord in majesty under a canopy rising to a height of 16ft. from the floor. The range of seven angels below the crucifix and the six at the sides bear in their hands the symbolical instruments of the Passion. The Blessed Virgin and St. John are in the two niches at the sides, and adoring angels above the arms of the cross. The six large niches which flank the central panel contain the chief saints of the locality—viz., SS. Matthew, John-the-Baptist, Paul, Nicholas, Cuthbert, and Aidan.





ITALIAN CASSONE AND FOLDING-CHAIR OF THE 16<sup>TH</sup> CENTURY.

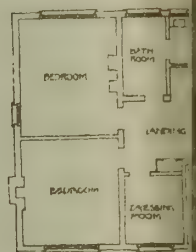
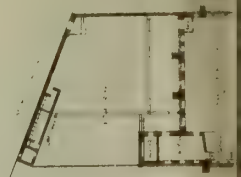








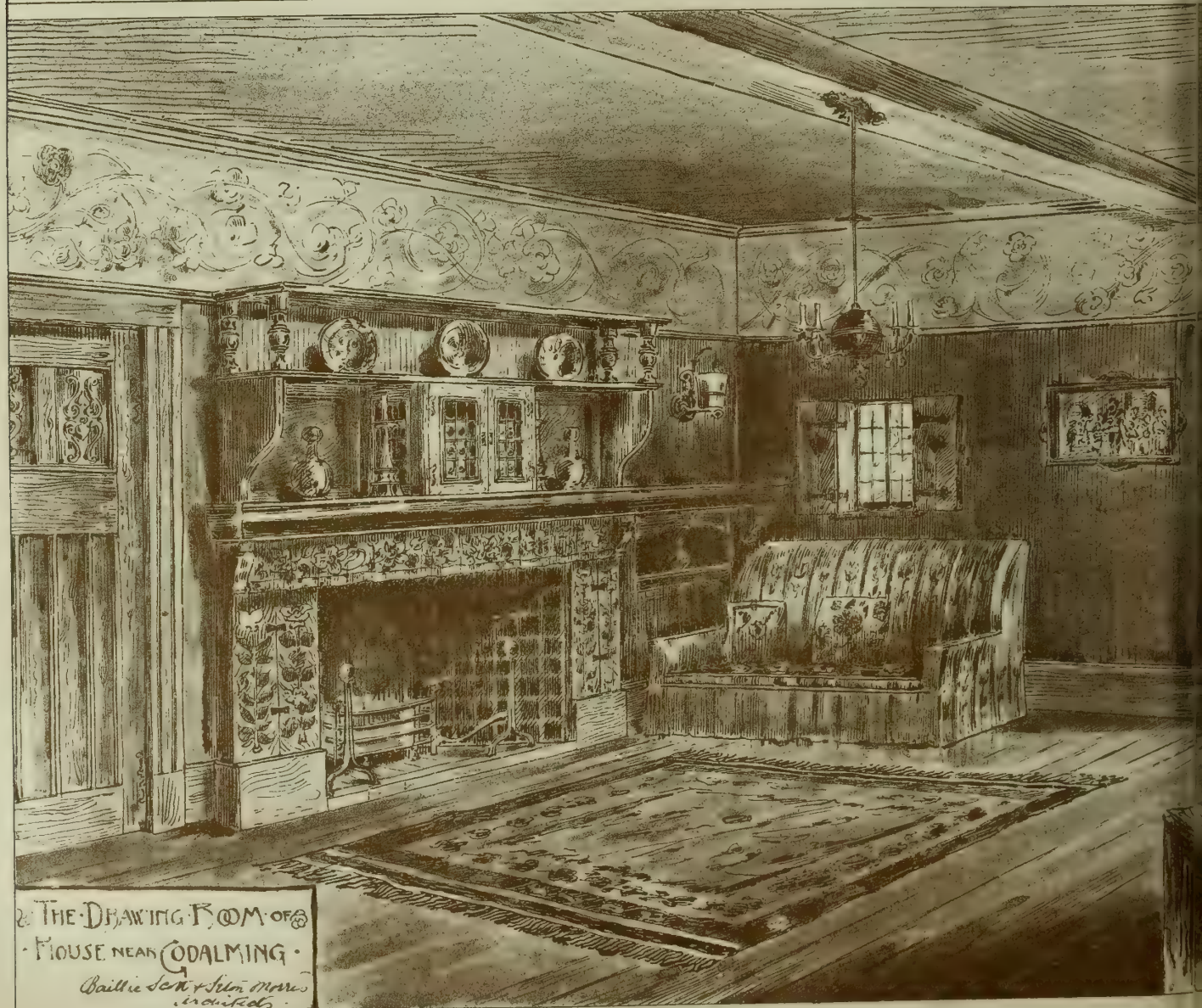
A HOUSE AT  
SLOUGH FOR F.  
C. BAYLEY ESQ.  
H. A. CROUCH, A.  
R. I. B. A. ARCHT.



FIRST FLOOR PLAN



GROUND FLOOR PLAN

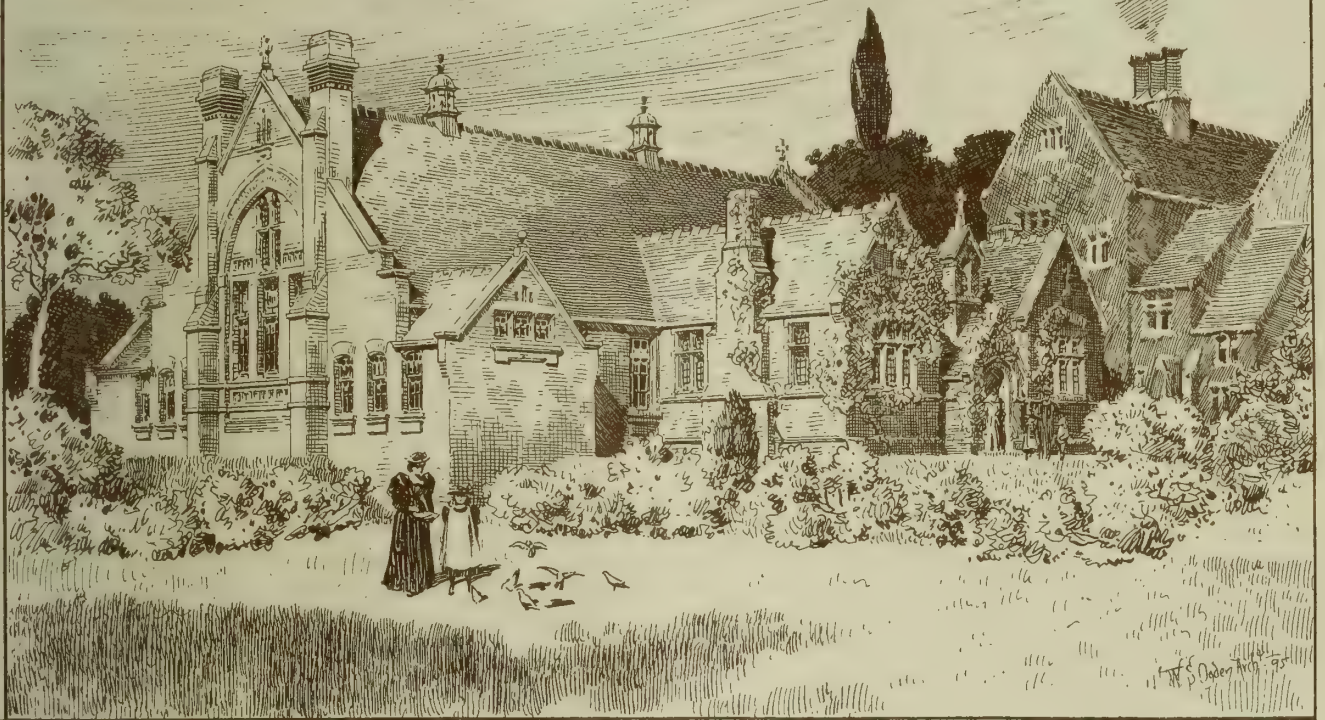


THE DRAWING ROOM OF  
A HOUSE NEAR GODALMING.

Baillie Scott & John Mordaunt  
London

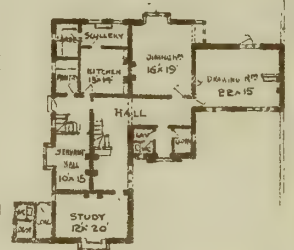


St John's Church Schools  
Higher Breckley, Manchester  
W. S. Ogden, Arch<sup>t</sup>



Proposed Country House  
for  
H. A. CARTWRIGHT ESQ.  
N. DEVON

Paul & Son, Somerset  
Architects



Ground Plan.



The Garden Front.



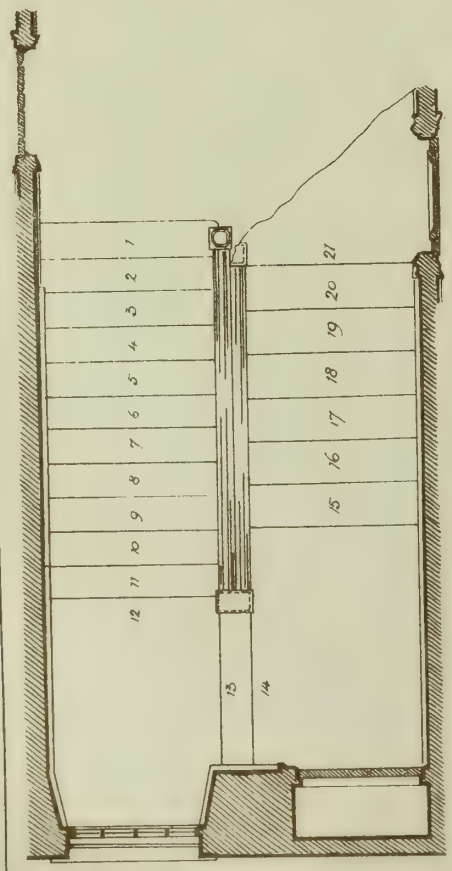






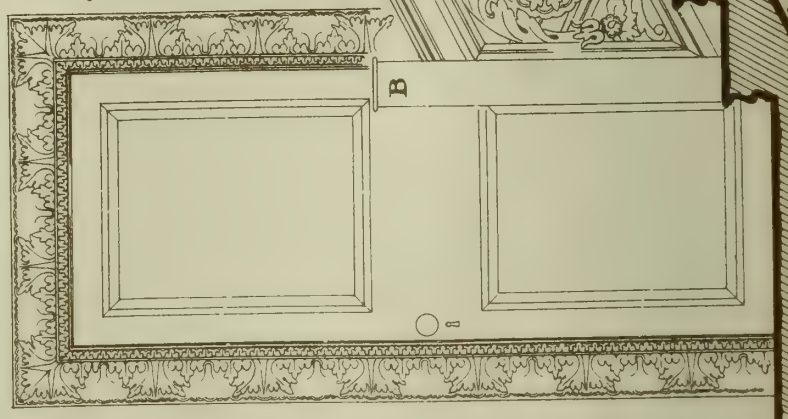


# Staircase in Old House at Lancaster .

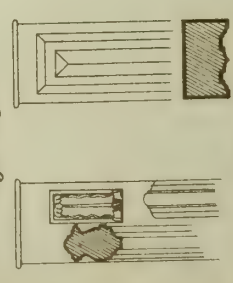


Scale of 1 2 3 4 5 6 7 8 9 10 feet

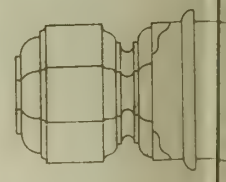
Note! The urebitrave round door on Second Floor is the same as this but is placed the reverse way.



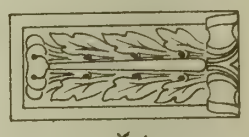
Panel at back of Newel .  
1/4 full size.



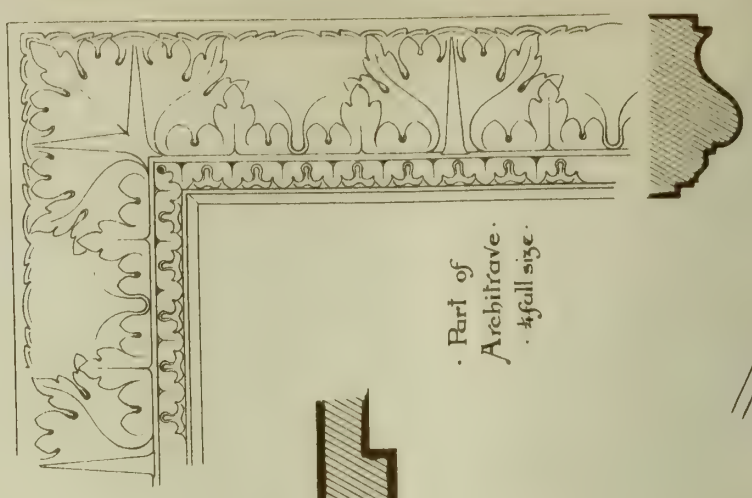
Front & Back Views of Newel Post B.



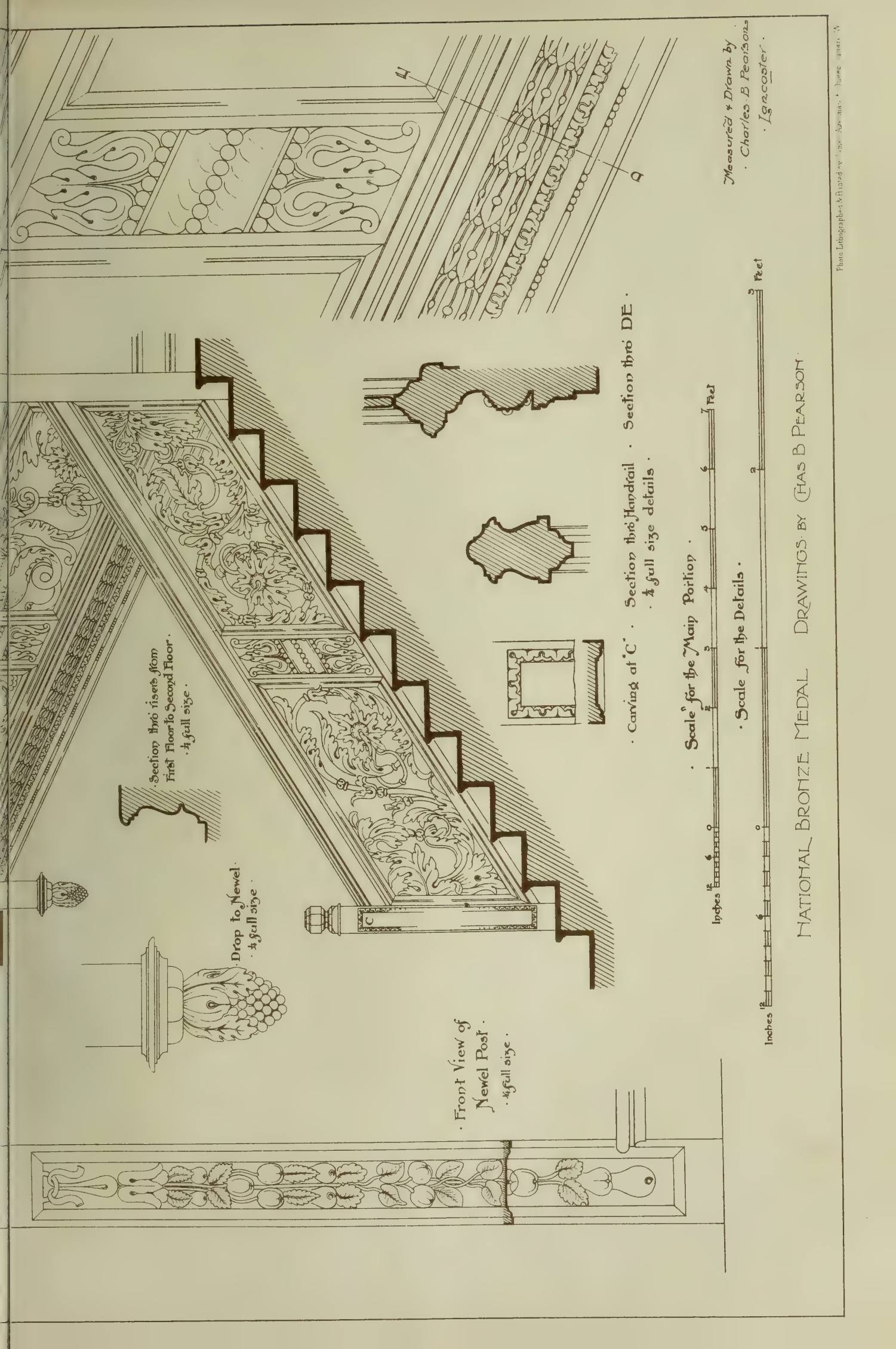
Carved Panel at back  
of Newel Post A.



Part of  
Architrave .  
1/4 full size.







Section thro' risets from  
First Floor to Second Floor.  
1/4 full size.

Drop to Newel.  
1/4 full size.

Front View of  
Newel Post.  
1/4 full size.

Carving at 'C'. Section thro' Handrail. Section thro' DE.  
1/4 full size details.

Scale for the Main Portion.

Scale for the Details.

Measured & Drawn by  
Charles B. Pearson  
Designed by  
Isaac Newton & James Watts

NATIONAL BRONZE MEDAL DRAWINGS BY CHAS B PEARSON



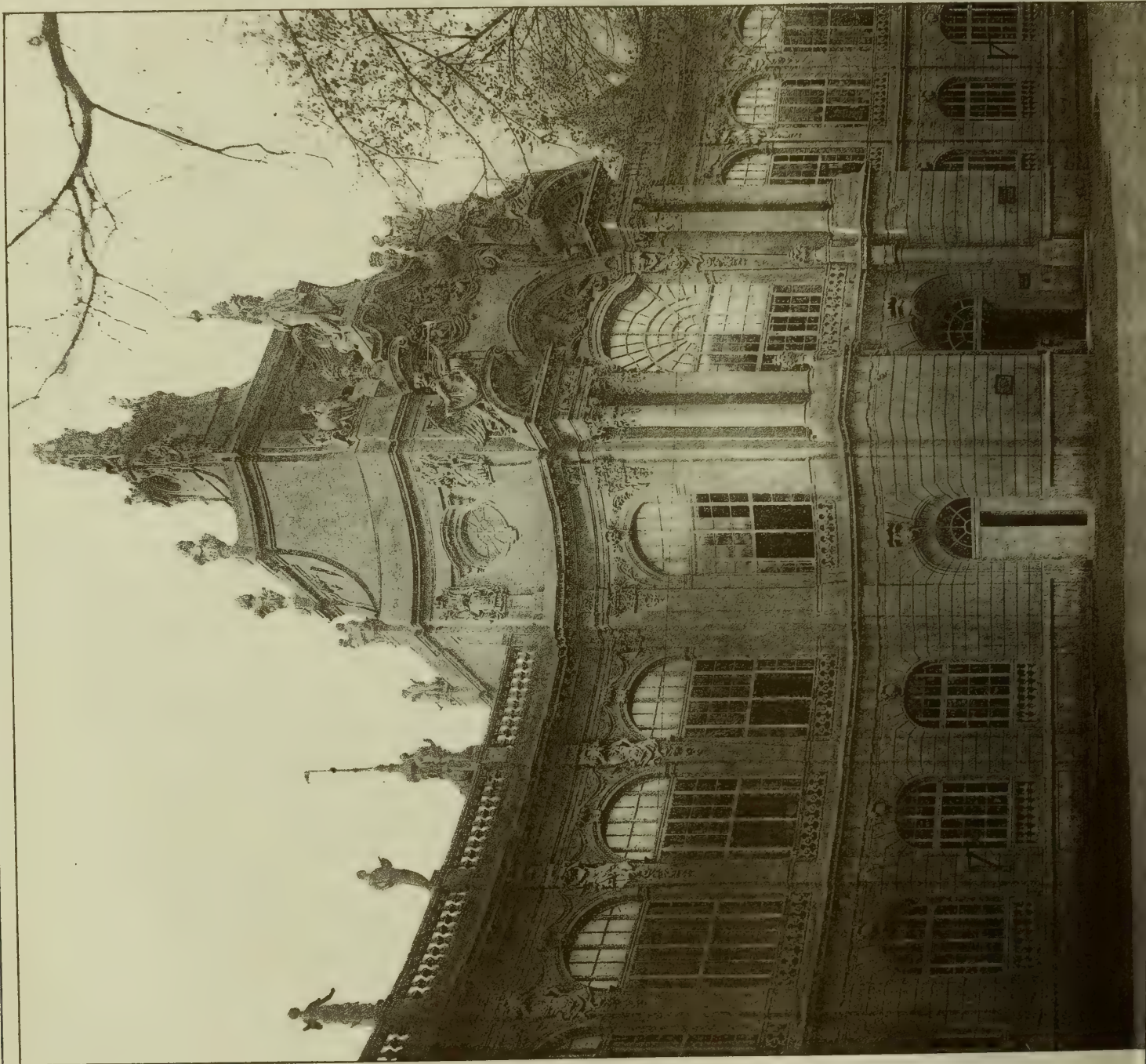








THE BUILDING NEWS, APRIL 2, 1897.







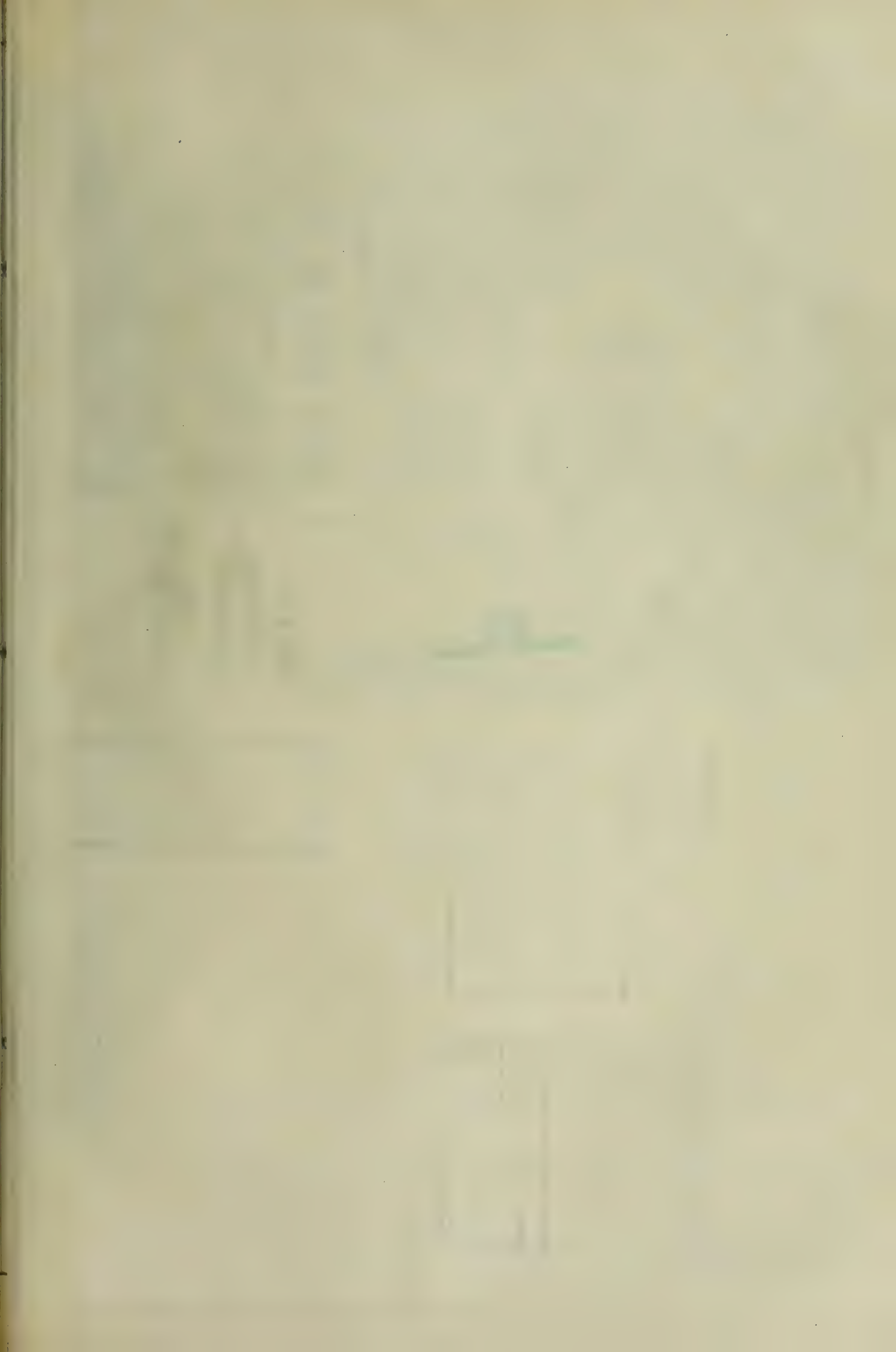
"PHOTO-TINT," by James Aketman 6 Queen Square London W.C.

THE MILLENNIAL EXHIBITION BUILDINGS · BUDAPEST ·  
IGNÁCZ ALPÁR ARCHT.

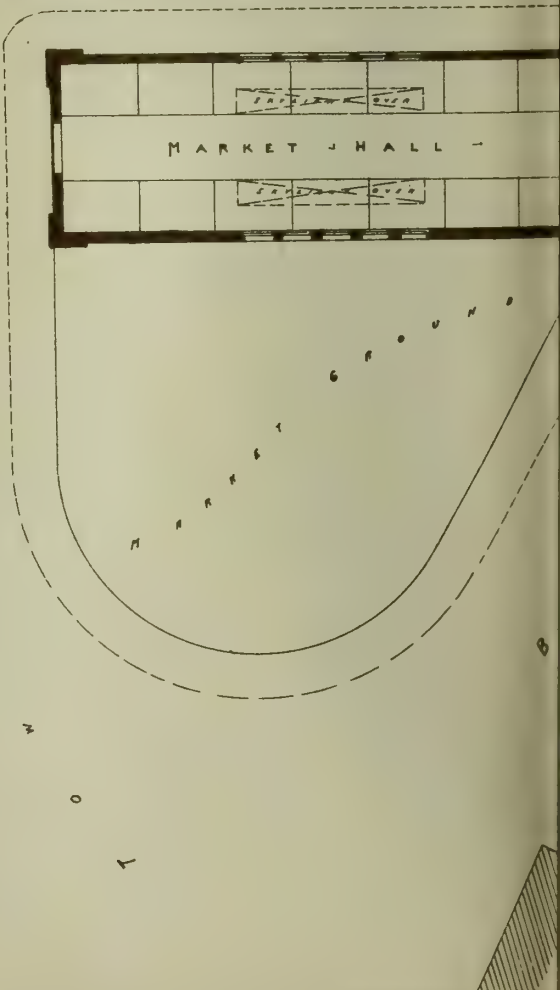
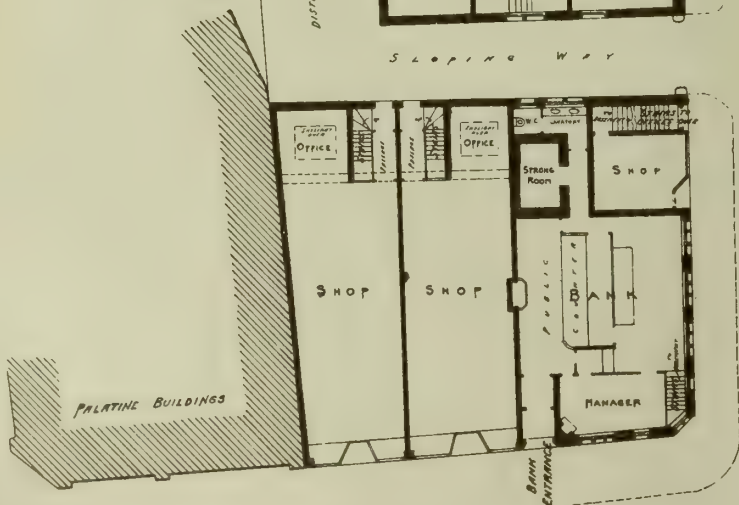
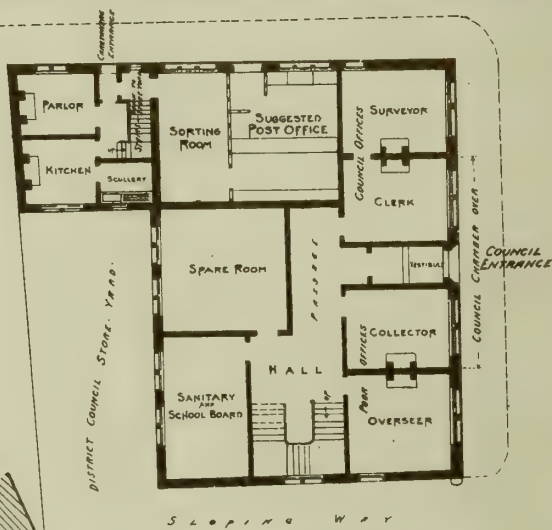




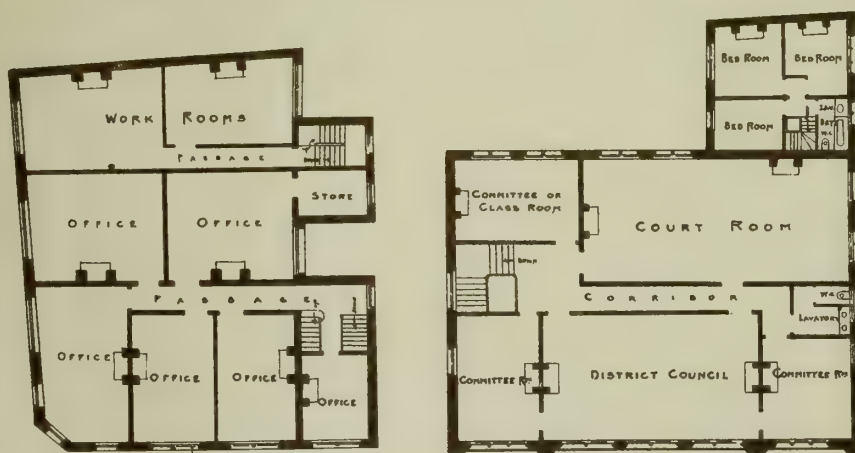












FIRST FLOOR PLAN

PROPOSED PREMISES FOR THE **MANCHESTER AND COUNTRY BANK LTD**  
 AND DISTRICT COUNCIL OFFICES AND MARKET HALL  
 FOR THE **GREATERWOOD URBAN DISTRICT COUNCIL**







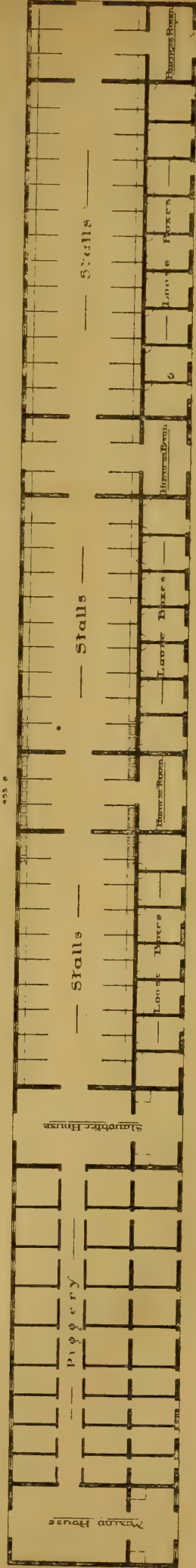
HARROD'S STORES LIM<sup>TD</sup>.  
NEW PIGGERY AND STABLE BUILDINGS AT BARNES, SURREY



William O. Hunt, Architect  
2 Norfolk Place  
Kensington W



ELEVATION



PLAN



## Building Intelligence.

**BELL-STREET MISSION.**—This new building has been erected by the committee of the London Domestic Mission Society to take the place of the Capland-Street station, and was opened on Wednesday. The site has a frontage of upwards of 35ft. to Bell-street, with a return frontage of 82ft. to Burne-street. The new building contains four stories—viz., basement, ground, first, and second floors. In the basement a large work-room has been provided, in which carpenters' benches, &c., can be used. On the ground floor a large and a small class-room have been arranged in the front building, and the whole of the rear portion has been devoted to the chapel, measuring 50ft. long by 30ft. wide. The chapel has an emergency exit to Burne-street, and is lofty and lighted by skylights in addition to a range of large windows facing Burne-street. On the first floor are two additional class-rooms and the missionary's private room, and on the second floor a further class-room with three rooms for the caretaker. Externally the building has been faced with picked stock bricks with red brick dressing, stone cornices and copings. The works have been executed by Mr. S. J. Scott, of Blomfield-street, E.C., at a cost of upwards of £3,000. The building has been fitted with electric light throughout, this work being carried out by Messrs. Strode and Co. The premises were designed by Mr. Howard Chatefield Clarke, of 63, Bishopsgate-street Within, E.C., and have been carried out under his personal superintendence.

**CLECKHEATON.**—The Free Methodist Central Sunday Schools at Greenside, Cleckheaton, were opened on Saturday. Mr. R. Castle, of Cleckheaton, is the architect, and the style of the schools is in harmony with the adjoining chapel. They consist of library, bank-room, and various classrooms, lecture-hall, and assembly-room. The last named provides accommodation for a thousand scholars. It is lighted on the Mortimer-street side by lofty mullioned and transomed windows, by a wheel-window in each gable, and by smaller windows on the chapel side. The lower part of the walls here and throughout the building is covered with varnished pitch-pine. The lecture-hall seats 250 persons, and besides the library, band-room, and sewing-room, there are five large and twelve smaller classrooms. Beneath the assembly-hall there is a tea-room accommodating 400 persons, with kitchen, scullery, and other rooms. The premises are to be lighted by electricity. The sum of £1,400 was expended on the site, and the total outlay will exceed £3,000. The works have been carried out by the following contractors:—Masons, Messrs. Geo. Horsfall and Sons, Liverpool; joiner, Mr. W. Isherwood, Cleckheaton; plumber, Mr. F. Newsome, Dewsbury; plasterer and concrete, Mr. James Lockwood, Staincliffe; wood-block flooring, Messrs. Nightingale and Co.; slater, Mr. John Roberts, Cleckheaton; gas-engine, &c., Messrs. Crossley Bros., Manchester.

**LIVERPOOL.**—New offices are being erected in James-street, Liverpool, for the White Star line of steamships. The building stands on about 6,640sq.ft. It has been designed by Mr. R. Norman Shaw, R.A. His representative there is Mr. J. Francis Doyle, of Harrington-street, Liverpool. The base of the office and up to the first-floor level is of Aberdeen grey granite, from which point upwards the walls are composed of red Ruabon bricks, set off with white Portland stone bands. Above the first floor is an entresol floor. On the fourth floor an outside balcony has been made, extending all round the building. At the angles of the building tourelles are introduced, upon the southernmost of which will be fixed a large clock, so placed as to project some 12ft. from the building, and visible from various points on the river.

**LLANFAIRFECHAN.**—The Heath Memorial Convalescent Home at Llanfairfechan was formally opened on March 25. The home has been founded by Messrs. Robert, James, and Arthur Heath, for the benefit of convalescent patients, as a memorial to their father, Robert Heath. The site of the home is on the Penmaenmawr-road. The building, which is of local stone, with dressed stone facings and lined with bricks, comprises a three-storied block, with a frontage of about 140ft. It contains day rooms and dormitories for the accommodation of 50 patients, with offices and servants' rooms, and suite of rooms for the

matron. The contents given to the dormitories vary from 750 to 1,000c.ft. for each patient. A gate lodge, with a washhouse and laundry connected to it by a covered way, has been built adjacent to the building. Mr. Thomas Bower, of Nantwich, Cheshire, is the architect, and Mr. John Gallimore, of Newcastle, Staffs, the builder.

**MILLBANK.**—The Prince of Wales will open in June next the National Gallery of British Art, at Millbank, now in course of completion. The building is erected on the site of old Millbank Prison. The style is Classic, freely treated, with Greek feeling. The basement, to a height of 10ft., is formed of rusticated masonry of Portland stone, which is the material used throughout the building. In the basement accommodation is provided for store-rooms, picture-cleaning rooms, rooms for students' easels, rooms for the reception of pictures, and furnaces, lavatories, &c. Access to the interior of the building from the Thames side, upon which the front entrance is situated, is obtained by means of a flight of 24 steps, 40ft. in width. In designing the building, the architect, Mr. Sidney R. J. Smith, F.R.I.B.A., of 14, York Buildings, Adelphi, aimed at enabling the visitors to enter and proceed right through the galleries without retracing their steps. On the first floor of the new building is the vestibule, which is about 50ft. long by 25ft. wide, and from which the central octagonal sculpture hall is approached. This hall is 38ft. across, and is surrounded on the outside by a corridor 15ft. wide. In the left wing is situated the long gallery, the length of which is 93ft. and the breadth 32ft. Next to it is the flanking octagonal pavilion, just 32ft. across. A pavilion of like dimensions is placed on the right wing of the building in a similar position. A smaller gallery, 60ft. by 32ft., completes the left wing. On the right there are two galleries, each 60ft. by 32ft., and the flanking octagonal pavilion already referred to. Two flights of stairs, composed of Silesian marble, lead up to the corridor on the first floor, which, like that on the ground floor, is 15ft. in width. On this floor there is only one gallery. Its dimensions are 56ft. in length by 26ft. wide. Overhead is the dome, supported on an arcading, composed of coupled Ionic columns with arches. The portico is supported by six Corinthian columns, 30ft. in height and 3ft. in diameter, with pediment on top. Placed upon one end of this pediment is the figure of the British lion, and on the other the unicorn. In the centre is a figure of Britannia. The frontage on the river is almost 300ft. in length. The grounds surrounding the structure will be laid out in gardens and inclosed by a massive iron railing. The building works were carried out under the immediate supervision of Mr. C. Coggin, A.R.I.B.A., and the contractors are Messrs. Higgs and Hill, of South Lambeth.

**SHEFFIELD.**—The corporation have built in the neighbourhood of Lumley-street, Attercliffe, a destructor for dealing with the refuse of the city. The building was formally inspected by the health committee on Friday, when Mr. C. F. Wike explained to the members the process of construction and the operation of the destructor. The building has been erected by Messrs. Longden, at a cost of £6,002, and the contract for the iron-work and cells was given to Messrs. Goddard, Massey, and Warner, of Nottingham, the patentees of the cells, for £2,207. It has been necessary to make an approach road, paved with granite, at a cost of £4,000. The road is built on girders and brick arches, and forms the roof for stores and workshops, a boiler-house and mortar mills, the intention being to convert the clinkers made in the destructor into mortar for building purposes. The Lumley-street approach is level, but an entrance has also been arranged on a lower level. In connection with the destructor is a weigh-house, and beneath the latter is a mess-room for the workmen. At present only six cells have been attached to the destructor. These will deal with 10 tons of ashpit refuse per day, or 60 tons altogether, but six more cells can easily be added on the other side. The flue contains a chamber to capture the dust and deposit which might otherwise escape by the chimney. The shaft is 180ft. high, but it is so designed that another 20ft. or 30ft. can be added to it. The shaft has been built with an air cavity between the outer and inner diameter, the latter being 7ft. 6in. throughout. There is a 10H.P. engine to work the mortar mill.

Mr. Post has been re-elected president of the American Institute of Architects.

## COMPETITIONS.

**BRISTOL.**—The School Board considered on Monday plans received for the proposed school at Westbury Park, and by the casting vote of the chairman adopted those submitted by Messrs. La Trobe and Weston, of Bristol.

**SEVENOAKS.**—At Monday's meeting of the Urban District Council, the committee for considering the plans submitted for the erection of workmen's dwellings reported that they had carefully considered the three plans submitted to them by the sub-committee, and had finally decided to recommend the Council to award the prize of £5 to the competitor signing himself "Bete." This proved to be Mr. A. C. Hodges, of Stratford, E., his figure for a four-roomed cottage being £175. The design placed second was by Mr. W. Ashmore, of Chesterfield (four rooms £183, five rooms £191); and that placed third by Mr. G. S. Crisp, of Cheltenham (four rooms £167, five rooms £211). Mr. Swaffield, in moving the adoption of the report, remarked that originally 48 designs were under the consideration of the committee. These were left to the surveyor and Mr. Potter to consider, and were eventually reduced to the three above mentioned. He thought that the Council, in returning the whole, should express their thanks to the competitors for their interest and assistance. This was carried unanimously.

## CHIPS.

The church of St. Mary, West Fordington, near Dorchester, was dedicated last week. The plans were prepared by Mr. C. E. Ponting, F.S.A., of Marlborough, diocesan architect, and the work has been carried out by Mr. H. Hoskings, of Hungerford, Wilts. The outlay on the church has been £1,000. The total length to the apse is 135ft., the length of the nave 95ft., and its breadth 42ft. It is constructed of corrugated iron, on a framework of wood, and the interior is plastered so as to have the appearance of an ordinary church. The roof is surmounted by a bell turret containing a tubular bell. The altar, presented by an anonymous donor, was the workmanship of Messrs. Hannen and Holland.

Most of the clerical staff engaged at Lord Penrhyn's quarries and shipping offices were paid off on Friday. There are still a few men at the quarries engaged in keeping the galleries free from falls of rock, and some are employed in dressing slate beds for a billiard table ordered for the Queen. Most of the slate yards are closed, and others are relying for their support upon the quarries in the Festiniog neighbourhood.

The City Commission of Sewers at Guildhall instructed their Finance and Improvement Committee on Tuesday to take the necessary steps to acquire as speedily as possible all interests in the properties needed for widening Fleet-street between Bride-lane and Salisbury-court. Mr. Alderman Treloar said it was proposed to widen Fleet-street 16ft. for a distance of 320ft., and it was desirable there should be no delay. A similar improvement in Ludgate-hill dragged on for 25 years. At the same meeting, the engineer (Mr. D. J. Ross) read a letter from Mr. Thomas Blashill, the architect of the London County Council, inviting an exchange of ideas as to the precautions to be taken for the public safety in the erection of stands to view the Royal procession. The communication was referred to the Streets Committee.

The Lord Mayor of Birmingham has consented to receive a deputation from the Birmingham Architectural Association this (Friday) morning, at 12.30, as to the proposed destruction of Christ Church. The following gentlemen have been nominated to form the deputation:—Messrs. W. Henman (president), Thomas Naden, Jethro A. Cossins, John J. Bateman, W. H. Bidlake, Edward R. Taylor, Charles E. Bateman (vice-president), and H. T. Buckland (secretary). The president and council of the English Church Union have made a grant of £20 towards the expenses of the opposition to this Bill, and the Free and Open Church Association have also promised assistance.

By the destructive fire which broke out in the town hall at Chester on Friday night, the council-chamber was entirely gutted; but the concrete floor and the iron and fireproof doors prevented the fire from extending to the mayor's parlour, the sessions-court, and the justices' retiring-rooms on the same floor, and to the police-station immediately beneath. The council-chamber, which had a panelled ceiling of deal and was wainscoted, was adorned with oil-painting of local worthies by distinguished artists. Of these two are destroyed and one damaged. The building, which was opened in 1869, replaces the 17th-century town hall, burnt down on Dec. 30th, 1862, and is a Venetian Gothic structure built at a cost of £30,000.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—D. S. S.—M. F. A.—E. B. W. and Co.—R. P. C. T. Co.—C. H. O.—B. W. Co.

## Intercommunication.

## QUESTIONS.

[11643].—**Drainage.**—Will any reader kindly inform me which is the best book published on house drainage?—S. A. McV.

[11644].—**Rainfall in England.**—Would some kind reader inform me what standard books explain the rainfall and the principles of the artesian well clearly? Would he also show me how the following problem is worked? What is the approximate average rainfall in England? The water has to be collected from a slate roof of a house measuring 40ft. by 60ft., and from a lead flat of an addition thereto, measuring 25ft. by 14ft. Give the number of gallons that would be collected during a year.—BAPFLED.

[11645].—**Architects' Charges.**—Will any of your readers kindly inform me the usual commission for preparing working drawings, surveying site, two sets of tracings, and all necessary sketches, &c., without specification and superintendence of work?—PERPLEXED.

[11646].—**Traversing.**—Can any reader explain for me the meaning of the following, which is given in a book called "Aid to Survey Practice," written by Louis D'A. Jackson, A.M.I.C.E., and published by Crosby Lockwood and Son in a second edition in 1895? After giving, on p. 47, the corollary to Euclid I. 32 as a check on the angles of a closed traverse which has all *salient* angles, it says, "And if there be any re-entering angles, the sum of all the *salient* inward angles should be equal to the sum of all the re-entering outward angles." This appears to me to be entirely incorrect.—W. F.

We regret to hear that, acting under his doctor's advice, Mr. T. Locke Worthington has had to leave London and give up his office—at any rate for the present. Letters should be sent to him: Care of S. B. Worthington, Esq., Mill Bank, Bowdon, Cheshire.

Kilrush House, county Clare, was destroyed by fire on Friday evening. The only portion of the building that was saved was the billiard-room. It was the family seat of Mr. Hector S. Vandeleur. The damage is estimated at £30,000.

## LEGAL INTELLIGENCE.

IN RE GEORGE HENRY WILKINS, of BELLUTON HOUSE, PENSEFORD, AND 48, THOMAS-STREET, BRISTOL, BUILDER AND CONTRACTOR.—The gross liabilities amounted to £12,710 6s. 11d., of which £4,568 was due to creditors fully secured, and £5,433 4s. 7d. to creditors unsecured. The assets were estimated to produce £3,487 17s. 10d., of which £1,477 was the expected surplus on Bristol and Frome contracts. The Official Receiver stated that the debtor had since September, 1891, carried on business as a builder and contractor, commencing with a capital of £250 borrowed from his father, which is still owing. At a private meeting of creditors held early in February, at which a rough statement of affairs (prepared by the debtor himself) was submitted, an offer of 10s. in the £ was made; but it was ultimately reduced to 6s. 8d., payable at four, six, nine, and twelve months date, the last to be secured, and it was accepted. Absent creditors having taken proceedings, the arrangement fell through, and the petition was filed. It was decided to administer the estate in bankruptcy, and Mr. E. T. Collins was appointed trustee.

ENGINEERING CONTRACT DISPUTE.—A dispute has been pending in the High Court of Justice for some time between Messrs. Murdoch and Cameron, Ltd., of London and Glasgow, engineers and contractors for public works, and the Corporation of Southend-on-Sea, over the erection of a promenade pier there, the contract price of which is about £20,000, and, in consequence, work has been suspended during the last five or six weeks. Sir William Arrol, M.P., of Forth Bridge, Tay Bridge, and Tower Bridge fame, with Mr. John Waugh, C.E., and Mr. William Jaffrey, M.I.C.E., having visited and inspected the pier, and reported favourably as to the state of the work and the probability of the pier being ready for the ensuing season's traffic, terms have been arranged between the corporation and the contractors, who are to receive £2,000 bonus in addition to their original contract price. The action has been taken out of court, and work on the pier has been resumed, under the direction of Mr. John Wolfe Barry, C.E., newly appointed engineer for the corporation. The counsel instructed by the contractors were Mr. John Charles Bigham, Q.C., M.P., Mr. John Lawson Walton, Q.C., M.P., and Mr. C. F. Lowenthal; solicitors, Messrs. J. E. and H. Scott, King William-street, E.C.

PARTY-WALL DISPUTE.—AERATED BREAD COMPANY v. SHEPHERD.—An action for trespass by lessees of No. 51, Cheapside, in respect of work done in rebuilding the adjoining premises, No. 52, Cheapside, by the owner, the defendant, has been heard in the Chancery Division by Mr. Justice North. The wall between the premises was a party-wall within the meaning of the Metropolitan Building Acts; it was in dispute, however, whether the wall was a party-wall in the sense that there was a common ownership, or whether the wall was, as the Judge held, entirely the property of the plaintiffs, subject to easements of support. A small question, that may be of some interest to surveyors, was raised on the construction of the existing London Building Act (1894) section 64 (18), which provides that all chimney flues are to be surrounded by new brickwork of a certain thickness. The defendant had put chimney flues against the plaintiffs' party-wall. These flues were constructed of actual new brick on three sides only. The two ends were bonded into the party-wall, the face of the party-wall itself forming the fourth side of the flue. The plaintiffs complained that the Building Act of 1894 had not been complied with. The defendant's expert witnesses, on the contrary, asserted that, in their opinion, it had, because the party-wall, being sound and in good condition, was to be considered new brickwork within the meaning of the Act. Mr. Justice North, however, considered that this construction of the enactment was absurd, and held that the defendant had not complied with the Act, which required the brickwork to be new at the time of the construction of the flues, although the district surveyor had passed the work. The Judge did not, however, consider it necessary in the circumstances to grant a mandatory injunction. His lordship decided the main issues recited in favour of the plaintiffs, and gave them the general costs of the action.

SLANDER ON AN ARCHITECT.—STREVS V. COLES.

—This action was heard last week in Queen's Bench by Mr. Justice Lawrence and a common jury. The plaintiff, Edmund Joseph Strevs, was an architect and surveyor residing in Camberwell-road. The defendant was a licensed victualler carrying on business at the Adam and Eve, High-street, Peckham, and the Swan public-house, Stockwell. The plaintiff alleged that on May 29, 1896, the defendant, at the Adam and Eve tavern, spoke the following words concerning him:—"He is a d—d thief and a d—d robber. He has robbed me, and I will see he don't do anything more if I can help." The defendant did not admit that he had spoken the words complained of, and in the alternative said that they were only abuse, and did not amount to defamatory matter. It is stated that

the plaintiff had a very large connection among licensed victuallars. Last year the plaintiff had been employed by the defendant to prepare plans for alterations in the Adam and Eve, but the plaintiff considered that the original plans involved too much expense, and consequently he engaged the plaintiff to make a fresh set. It was in connection with the plaintiff's charges for these services that the defendant had uttered the words complained of. There had been litigation between the parties with regard to these charges, but in the end defendant had paid the plaintiff £95 and costs in settlement of his bill, which amounted to £116. Mr. Strevs, the plaintiff, was called, and said his practice was chiefly connected with building and altering public-houses. The amount of his account had been settled amicably with the defendant. He had lost business through the utterance of this slander. Mr. King, a builder, gave evidence as to the publication of the defamatory words. The jury found a verdict for the plaintiff for 5 guineas. Judgment was given accordingly.

ACTION BY ARCHITECTS AGAINST A BUILDER.—In the Queen's Bench Division, on the 26th ult., Mr. Justice Vaughan Williams, sitting without a jury, heard the case of "Homer and another v. Herbert," an action brought by Messrs. Homer and Ridler, architects and surveyors, 35, Bucklersbury, E.C., to recover from Mr. William Herbert, a builder, the sum of £52 10s., the balance of fees. The case for the plaintiffs was that, as architects, they advised Mr. John Roycroft, the freeholder of some land in the Ardville-road, Brixton, who was erecting on the same blocks of residential flats. In October, 1894, the defendant was introduced to Mr. Homer by a Mr. Barnes, a surveyor, with a view to his undertaking the building of a block of flats. Mr. Homer showed to the defendant the plans and specifications of two blocks of flats of a similar character which had been erected, and told the defendant that the cost of building each block was about £3,600. Mr. Homer also told the defendant that his firm's fees as architects would be at the rate of three guineas per cent. on the gross cost, which would amount to £113 8s.; but, in order to make it even money, he would reduce the fees to £112 10s., that being the amount the other builders had paid them for the same work. After further negotiations, the defendant executed the building agreement between himself and Roycroft, and also signed two specifications prepared by the plaintiffs. After that the defendant commenced the work, Mr. Roycroft making the advances according to the terms of the building agreement. Plaintiffs received a portion of their fees, but defendant denied liability to pay the balance. In July, 1896, they therefore signed judgment against the defendant for the amount due; but, not being able to obtain payment, instituted proceedings in bankruptcy against him. But the defendant then came before the Court and filed certain affidavits, alleging that his then solicitor had been negligent, and he succeeded in getting the judgment set aside. Mr. Edward Chas. Homer gave evidence, bearing out the statement of counsel. His lordship said it seemed a high percentage to get for the job. Mr. Knight, a surveyor, estimated the cost of the building as erected at £3,512. The defendant said that Mr. Homer did not tell him that the estimated cost of the building was £3,600. The first time he knew anything about the specification was about two months afterwards. The building had actually cost £2,030. It was completed with the exception of work worth £7. He denied that the signature on the specification was his, and adhered to the statement in cross-examination. Mr. Frank Barnes, a surveyor, Colville-road, Bayswater, gave evidence as to introducing the defendant to Mr. Homer. At that interview nothing was said about the building costing £3,600 or about Mr. Homer's fees. No specification was produced at that interview. He did not think that the signature on the specification produced was the defendant's. The cost of the building in question at the outside was £2,200 or £2,300. His Lordship, in giving judgment, said that he did not like to decide a case in any way upon a question of comparison of signatures, because he had no faith in his own capacity as an expert. But, at the same time, he had no real doubt that the signature to the flimsy specification in question was the signature of Mr. Herbert. The inference he drew from the evidence was that Mr. Herbert was perfectly well aware when he took up this job, that he would have to pay the architects' fees, and that their fees would be £3 3s. per cent. on something. He did not believe that the sum of £3,600 was mentioned, nor did he believe that the sum of £112 10s. was agreed upon. But he did believe that the £3 3s. per cent. should be, not on the advances, but upon the cost of the building. In the result His Lordship fixed the plaintiffs' remuneration at the sum of £94 10s., which, after giving credit for the £60 paid, left £34 10s. as the balance then due, for which amount he ordered judgment to be entered. He should not give any costs to either side. Judgment for plaintiff for £34 10s., without costs.



## STATUES, MEMORIALS, &amp;c.

HEREFORD.—The monument erected to the memory of the late Bishop Atlay in the north transept of Hereford Cathedral was unveiled by the Bishop of Gloucester and Bristol on Friday. The monument cost £800. It consists of a recumbent life-size figure of Bishop Atlay, in Carrara marble, laid upon a cenotaph of Belgian marble, the height of the whole being 4ft. 9in. It rests on a base of Belgian black marble, upon which is a plinth of Belgian rouge royal marble. The cenotaph is of cream-coloured Belgian marble, shaped into panels, with dwarf columns of rouge marble. A mitre is carved on the west end panel of the cenotaph, and on the east panel a shield presenting the Atlay arms and the arms of the see of Hereford impaled. In the north transept are also the 13th-century tombs of Bishop Cantilupe and Bishop Aquablanca.

## CHIPS.

The Bishop of Salford (Dr. Bilsborrow) laid the foundation-stone of St. Mary's Roman Catholic Church, Dodge Hill, Heaton Norris, Stockport, on Saturday. The church will accommodate 450 persons, and will cost about £3,500. Messrs. Pugin and Pugin, of London, are the architects, and Mr. Josiah Briggs, Stockport, is the contractor.

The Official Receiver has issued to the creditors of Mr. William Goodchild, builder, of Weldale-street, Reading, particulars in reference to the debtor's estate. The published statement of affairs shows gross liabilities £11,733 8s. 11d., of which £2,915 9s. 3d. is expected to rank, while the assets are estimated (by the debtor) to produce £2,915 9s. 3d. The Official Receiver says:—During the last year the bankrupt was practically unable to pay a considerable claim for road rates, and, upon being sued for a small debt, the judgment was recorded in trade papers. This took place in January, 1897. On January 22, 1897, a fire demolished the bankrupt's yard and much of his stock.

At a meeting held at Grimsby, last week, the scheme for erecting provident houses as a Diamond Jubilee memorial was further advanced. A general committee and a building sites sub-committee were nominated, and Mr. Scaping, of Grimsby, was appointed architect, it being stated that he had carried out similar works at Newark and Hull, the former as the outcome of an open competition. It is proposed to expend on the buildings about £7,000.

At Llandudno, Admiral Sir George Nares, on behalf of the Board of Trade, has held an inquiry into the application of the Victoria Pier Company for a provisional order to construct a pier, pavilion, and other erections in Llandudno Bay, opposite the property of the Victoria Palace Company. Sir George Nares pointed out that the new pier was estimated to cost £35,000, and the capital raised was only £20,000. The promoters said the balance of the money would be subscribed.

At the meeting, on Monday, of the surveying committee of the Bath Corporation, a member, who at the last meeting obtained a return from the city surveyor showing that in the last ten years 956 new houses had been built in Bath, presented a statement showing that there were now 592 void houses in the city, compared with 468 in 1888. The chairman said according to the statistics they had now 800 more houses in occupation in the city.

The quaint old residence of Sir Edmund Lechmere Bart., at Severn-end, near Worcester, which was nearly destroyed by fire last October, is now in course of restoration under the direction of Messrs. Lewis Sheppard and Son, architects, Worcester. Messrs. Collins and Godfrey, of Tewkesbury, are the builders.

The London County Council received on Tuesday a report from their Building Act Committee recommending that steps be taken, by means of an appeal against a recent magisterial decision, to obtain a decision from the High Court upon the question of the meaning to be attached to the expression "houses to be inhabited or adapted to be inhabited by persons of the working class." The matter is stated to be of the gravest importance, as involving a most serious question as to whether buildings can be used as working-class dwellings which do not conform to the requirements of the London Building Act of 1894 as regards provision of the proper open space at the rear, and other matters.

The Metropolitan Asylums Board accepted, on Saturday, the tender of Mr. Selden Hipwell, of Wisbech, to erect for the sum of £5,091 a home for the female attendants at the Caterham Asylum, in accordance with the plans and specifications prepared by Mr. E. T. Hall, architect. The architect's final estimate of the work was £5,000. Plans were approved for the erection of a new pavilion, to contain 28 beds, at the South-Western Hospital, and for the main engineering works required in connection with the extension works now in course of progress at the Western Hospital. The architect's estimate of the cost of the erection of the pavilion was £5,745, and of the engineering works £4,000.

## Our Office Table.

A CURIOUS, but hardly workable, modification of the architects' registration movement is reported from Wisconsin, where steps are being taken to establish a "State Board of Architects," to consist of five or seven of the most competent and trustworthy architects of the State. The duty of the Board will be to examine into the qualifications of persons who may seek to practise architecture within the State. A similar movement is on foot in California. The old inquiry *Quis custodiet ipsos custodes?* arises, for who is to guarantee that the examiners are the "most competent and trustworthy architects" of the district, and that jealousy will not bias their judgments? The only practicable solution of the problem is to register all existing practitioners, and to ordain that those entering the profession after a certain date shall pass a qualifying examination.

UNDER the auspices of the District Council for Edinburgh and the East of Scotland of the National Registration of Plumbers, a lecture on "Water Hammer in Pipes" was delivered on Friday night by Professor Stanfield in Heriot-Watt College, Edinburgh. He began by defining potential and kinetic energy, and showed that water might possess one or both of these kinds of energy. A mass of water moving with a certain velocity possessed a definite amount of kinetic energy, and to reduce this to rest required the application of force. The degree of force depended upon the time occupied in bringing it to rest. He showed that in a steam-pipe a mass of water might possess such a large quantity of energy as to produce a force sufficient to fracture the pipe. The same sort of action might take place in pipes supplying mines with high-pressure water. The useful application of the kinetic energy of water was shown in the hydraulic ram, which was capable of raising water to a higher level than that from which the water flowed. The lecture was explained throughout by illustrations and experiments, showing the principle of the hydraulic ram and the effect of the water hammer in pipes.

THE annual meeting of the members of the North-Western Sanitary Inspectors' Association took place at Crewe on Saturday afternoon. A visit was first paid to the Corporation farm, where the treatment of refuse was shown by Mr. J. Woodhouse, the manager, the filter beds being also examined. A visit was also paid to the disinfecting station, and the "Equifex" spray disinfectant was demonstrated by Mr. W. Urquhart and Dr. Jones, medical officer for the borough. The party then proceeded to the new sanatorium which is being erected by the Corporation at a cost of about £10,000. The annual session was afterwards held; Mr. W. Bland, of Barton, Manchester, presiding. Delegates were present from Liverpool, Stafford, Burslem, Wigan, and other Northern and Midland towns. The Mayor of Crewe (Alderman W. McNeill) welcomed the association to Crewe. On the motion of Mr. Bland, seconded by Mr. Poulson (Potteries), it was resolved to change the title of the association to the "North-Western and Midland Sanitary Inspectors' Association." Dr. Jones introduced a discussion on the "Methods of Disinfection." He explained the new methods of disinfection now adopted in Crewe, this being by means of a spray with a solution of perchloride of mercury, one in 1,000. They had disinfected 346 rooms at a cost of about £100, or 5s. 3d. a room. He held that this was more effective for the destruction of germs than the old system of sulphurous fumes. In the course of discussion the chairman, Mr. Beech (Burslem), Mr. Pailson (Stafford), Dr. Berry (Wigan), Mr. R. J. Hughes (Rhyl), Mr. Mort (Lymm), and others favoured the method of fumigation by sulphur.

SOME statistics in regard to the cost per square foot of buildings of various kinds in New York are given in *Dun's Review*, of that city. The figures are averages, so that there would probably be considerable variation on either side in actual cases, but they are not without interest. Frame dwellings, it finds, of the cheap, two-story class, average in cost 3-71dol. per square foot of ground covered, or 1-85dol. per square foot of floor space. Brick dwellings of three stories average 3-65dol. per square foot of floor, counting nothing for the cellar; five-story houses cost exactly the same; and four-story ones, averaging the few examples found, cost a trifle less. Flats of

five and six stories average only 2-03dol. per square foot of floor; flats with stores underneath cost 2-83dol.; "stores and lofts"—that is, ordinary mercantile buildings—give 3-12dol. per square foot of floor where the building is not over six stories high. A six-story hotel cost 3-33dol. per square foot of floor, and a twelve-story warehouse a little less than 3dol. Office buildings of the sky-scraper sort are much more expensive, one of nineteen stories costing 116-82dol., and one of twenty-one stories 123-34dol. per square foot of ground covered, or 6-14dol. and 5-37dol. respectively per foot of floor space. These figures appear to be taken from the estimated cost, as given in the books of the municipal building department.

PROFESSOR ROBERT BELL, M.D., LL.D., Assistant Director of Geological Survey of Canada, lectured to the Glasgow Branch of the Royal Scottish Geographical Society on Friday evening, on "The Geographical Distribution of Forest Trees in the Dominion." Mr. R. S. Allan presided. The lecturer described the area lying between the Atlantic Ocean and the prairie region to the east of the Rocky Mountains, which he has been exploring more or less for the last forty years. In the United States there were no fewer than 340 different species of trees, and that number would be increased were they to include Mexico and Central America. In Canada they had 123 species, of which 94 were east of the Rocky Mountains, and the other 29 in British Columbia. The State of Ohio appeared to be the centre of this prolific growth of forest, and for some hundreds of miles around it they had perhaps the most wonderful forest in the world in regard to variety of species. The lecturer also gave an account of his explorations during the last two or three years in the region of the Hudson Bay, in the course of which he discovered a river 500 miles in length.

APPROX of the recent opening of the celebrated Borgia Apartments in the Vatican, with the beautiful frescoes by Pinturicchio, it may not be uninteresting to mention that there is a model of a portion of one of the "stanzas" in the South Kensington Museum. In 1885 the Museum authorities obtained permission to have a model made of a portion of one of the rooms, and in 1888 it was completed and forwarded to South Kensington. The delicate relief decoration of the groins and bands was executed in the model by Signor Adolfo Consolani, and the copies of the frescoes were painted by Count Lemmo Ressi Scotti of Perugia. The frescoes represented in the model are "St. Catherine before the Emperor Maximin," "The Escape of St. Barbara," and the "Visit of St. Paul the Hermit to St. Anthony." The subjects of the paintings on the ceiling are scenes in the story of Osiris.

AT the annual convention of the National Brick Manufacturers' Association of the United States, held recently in Buffalo, the vexed question of how to prevent the appearance of efflorescence on the surface of brick was discussed at considerable length. The consensus of opinion of the most experienced manufacturers was that the solution of the difficulty lies in slow firing and drying, and in maintaining as large a flow of air as possible through the kiln until the water-smoke shall have evaporated the moisture.

WE understand Mr. Charles Symons, timber merchant, of Barnstable, has bought the whole of the fallen elms, numbering about 1,000, on the finely-wooded estate of Sir John Shelley, Bart., at Shobrooke, near Crediton, taking the butts at 2½d. a foot cube all round as they lie. The dozen or more enormous elms blown down during the same gale on the historic mound in the midst of Exeter, known as Northernhay, have been purchased from the city council by Messrs. Wilson and Son, timber merchants, Exeter, for 4d. a foot cube; and a large number of elms also blown down on the Bonhay, another of Exeter's pleasure grounds, have been bought at the same price by Mr. W. Gibson, of that city.

Major Holt, of the Grange, Farnborough, has signified his intention to erect, at a cost of over £2,000, a public hall at North Farnborough.

The annual dinner of the Ipswich Building Trades Association was held at the Crown and Anchor Hotel on Thursday evening in last week, the chairman, Mr. A. Coe, being supported by Councillors E. Catchpole, W. Grayston, and Geo. Fenn, Messrs. C. Borrett, S. Kenney, R. Bennett, W. S. Clark, F. J. Snare, G. L. Friend, J. Baker, T. Parkington, and many others.



## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).**—St. Paul's Ecclesiastical Society. Visit to the Churches of St. Stephen Walbrook, 3 p.m.; St. Swithin, London Stone; and St. Mary Abchurch, conducted by G. H. Birch, F.S.A.

**MONDAY.**—Surveyors' Institution. "London—an Appreciation," by Walter Simms, F.S.I. 8 p.m.  
Society of Engineers. "The Rating of Engineering Undertakings," by P. Michael Faraday. 7.30 p.m.  
Society of Arts. "Alloys," Cantor Lecture No. 4, by Prof. W. C. Roberts-Austen, C.B., F.R.S. 4.30 p.m.  
Liverpool Architectural Society. "Hospital Construction," by Wm. Henman, F.R.I.B.A., of Birmingham. 8 p.m.

**TUESDAY.**—Builders' Benevolent Institution. Annual Dinner at the King's Hall, Holborn Restaurant. 6 for 6.30 p.m.  
Society of Arts. "Recent Travels in Rhodesia and British Bechuanaland," by C. E. Fripp. 8 p.m.  
Institution of Civil Engineers. Discussion on "Electric Lifts and Cranes." 8 p.m.

**WEDNESDAY.**—Society of Arts. "Dairy Produce and Milk Supply," by M. J. Dunstan, F.R.S.E. 8 p.m.  
Edinburgh Architectural Society. "The Origins of Greek Architecture," by W. J. Anderson, A.R.I.B.A. 8 p.m.

## CHIPS.

On Wednesday week, Col. Durnford, R.E., held an inquiry at Burton-on-Trent concerning an application made by the corporation for leave to borrow £5,000 for the purpose of providing gas-stoves and prepayment gas-meters, and £1,000 for public free library purposes.

Mr. W. A. Ducat, Local Government Board Inspector, held a public inquiry in the board-room at Chatham Asylum on Tuesday week, respecting the application of the Kent County Council for permission to borrow £44,000 for the enlargement of the asylum. Mr. Prosser, clerk to the county council, spoke in support of the application, to which no opposition was offered, the estimates being:—Building new blocks, £33,500; architect and clerk of works, £1,500; furniture and fittings, £3,000; alterations to existing buildings, including further furniture, £6,000. Mr. W. J. Jennings, of Canterbury, the architect, produced and explained the plans.

In the case of Frederick Stephen Short, of Parkstone, architect and surveyor, a discharge from bankruptcy has been granted conditionally.

The building trade in Aberdeen is very brisk at present. Plans of eighteen new buildings, which include ten dwelling-houses, were sanctioned on Friday. The total value of the works is about £10,000.

The committee of King's College Hospital have appointed Mr. Townsend Green (Weatherall and Green) honorary surveyor for the hospital.

The firm tone of the estate market at Tokenhouse Yard was fully maintained last week, and in many cases prices ruled considerably above the average. Although, with one exception, the transactions did not possess any special importance, there was a fair all-round supply of investments of a sound character, which were fully appreciated by investors. The aggregate returns amount to £102,717, as compared with £88,817 registered for the corresponding week of last year.

Mr. George Bridge Hilliard, F.S.I., a well-known auctioneer and valuer in Essex, died on Tuesday at Oxney House, Writtle, near Chelmsford, at the age of nearly 74 years. The deceased, who was agent for all the English estates of St. Bartholomew's Hospital, was one of the founders of the Surveyors' Institution, his number on the roll of membership being 220.

At the Bristol Police Court, on Saturday, Thomas Francis Ball, assistant engineer and surveyor to the Bristol Corporation, was charged with stealing, on March 26, £70 in money, the property of the burgesses of Bristol. Mr. Wise (from the town clerk's office) prosecuted, and in applying for a remand, submitted that it was not a case in which bail should be granted, as it had very good ground to believe that the charge would not be only £70, but more like £1,500 or £2,000. The Bench decided not to grant bail under the circumstances.

On the festival of the Annunciation a stained-glass window was dedicated in Beaconsfield Church, Bucks, as a memorial to the late rector, Canon Cholmeley. The window consists of three main lights, which are filled with figures of St. Mary Magdalen, St. Hugh of Lincoln, and St. Osmund of Salisbury. As part of the memorial the south chapel, where the window is placed, has been fitted up for week-day services and celebrations. The whole of the work has been carried out by Messrs. Bucknall and Comper, of 19, Old Queen-street, Westminster. Under the direction of the same artists the chancel roof has been decorated and the entire church cleaned and relighted.

## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6	to £6 0 0
Rolled-Steel Joists, English.....	6 0 0	" 6 10 0
Wrought-Iron Girder Plates.....	5 15 0	" 7 10 0
Bar Iron, good Staffs.....	7 0 0	" 8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0	" 17 10 0
Do., Welsh.....	5 15 0	" 5 17 6
Boiler Plates, Iron—		
South Staffs.....	7 17 6	" 8 5 0
Best Sneedhill.....	10 0 0	" 10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
Per ton.		
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	... £11 0 0
Best ditto.....	11 5 0	" 11 10 0
Cast-Iron Columns.....	£6 0 0	to £8 10 0
Cast-Iron Stanchions.....	6 0 0	" 8 10 0
Cast-Iron Sash Weights.....	—	" 4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0	" 5 15 0
4in. to 6in.....	5 5 0	" 5 10 0
7in. to 24in. (all sizes).....	4 15 0	" 5 0 0
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]		

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to 110s.	
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.	
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.	75p.c. Fittings 77p.c.	
Gas-Tubes.....	70	" 72½
Water-Tubes.....	62½	" 65
Steam-Tubes.....	60	" 62½
Galvanised Gas-Tubes.....	55	" 57½
Galvanised Water-Tubes.....	45	" 47½
10cwt. casks. 5cwt. casks.		
Sheet Zinc, for roofing and working.....	£23 0 0	to £24 0 0
Sheet Lead, 3lb. per sq. ft. super.....	13 5 0	" 14 17 6
Pig Lead, in 1cwt. pigs.....	13 0 0	" 14 15 0
Lead Shot, in 25lb. bags.....	16 0 0	" 17 0 0
Copper Sheets, sheathing and rods.....	63 0 0	" 64 0 0
Copper, British Cake and Ingots.....	53 0 0	" 53 10 0
Tin, Straits.....	60 5 0	" 60 15 0
Do., English Ingots.....	64 10 0	" 65 0 0
Spelter, Silesian.....	17 15 0	" 18 5 0
Cut Clasp Nails, 3in. to 6in.....	£8 15 0	" 9 15 0
Cut Floor Brads.....	8 10 0	" 9 10 0
Wire Nails (Points de Paris) —		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9 per cwt.		

## TIMBER.

Teak, Burmah.....per load	£13 5 0	to £18 10 0
" Bangkok.....	11 10 0	" 15 0 0
Quebec pine, pitch.....	2 0 0	" 4 0 0
" Oak, yellow.....	5 0 0	" 6 0 0
" Birch.....	3 10 0	" 5 5 0
" Elm.....	3 15 0	" 5 0 0
" Ash.....	3 0 0	" 4 7 6
Dantsic and Memel Oak.....	2 10 0	" 3 10 0
Fir.....	2 15 0	" 4 15 0
Wainscot, Riga p. log.....	2 5 0	" 4 10 0
Lath, Dantsic, p.f.....	4 10 0	" 5 10 0
St. Petersburg.....	5 0 0	" 6 10 0
Greenheart.....	8 0 0	" 9 0 0
Sequoia, U.S.A. ....per cube foot	£0 1 9	to £0 2 0
Mahogany, Cuba, per super foot		
lin. thick.....	0 0 4½	" 0 0 6
" Honduras.....	0 0 5	" 0 0 6½
" Mexican.....	0 0 4	" 0 0 5
Cedar, Cuba.....	0 0 4½	" 0 0 5
" Honduras.....	0 0 4	" 0 0 5
Satinwood.....	0 0 7	" 0 1 0
Walnut, Italian.....	0 0 3½	" 0 0 7
Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. —		
Quebec, Pine, 1st.....	£20 0 0	to £23 0 0
" 2nd.....	14 10 0	" 16 10 0
" 3rd.....	7 0 0	" 10 0 0
Canada Spruce, 1st.....	9 10 0	" 11 0 0
" 2nd and 3rd.....	7 15 0	" 9 0 0
New Brunswick.....	7 10 0	" 8 5 0
Riga.....	7 10 0	" 8 10 0
St. Petersburg.....	9 10 0	" 13 10 0
Swedish.....	9 0 0	" 16 10 0
Finland.....	9 0 0	" 9 10 0
White Sea.....	10 10 0	" 17 0 0
Battens, all sorts.....	5 0 0	" 20 0 0
Flooring Boards, per square of lin. —		
1st prepared.....	0 9 0	" 0 16 0
2nd ditto.....	0 7 6	" 0 12 6
Other qualities.....	0 5 9	" 0 7 0

Staves, per standard M:—		
Quebec pipe.....	35 0 0	" 42 10 0
U.S. ditto.....	230 0 0	" 240 0 0
Memel, cr. pipe.....	200 0 0	" 210 0 0
Memel, brack.....		

## OILS.

Linseed.....per ton	£14 17 6	to £15 7 6
Rapeseed, English pale.....	25 10 0	" 26 0 0
Do., brown.....	23 10 0	" 26 15 0
Cottonseed ref.....	14 17 6	" 15 7 6
Olive, Spanish.....	29 0 0	" 30 0 0
Seal, pale.....	23 15 0	" 24 0 0
Cocanut, Cochín.....	27 15 0	" 28 0 0
Do., Ceylon.....	23 10 0	" 23 10 0
Palm, Lagos.....	22 9 0	" 23 10 0
Oleine.....	19 0 0	" 20 0 0
Lubricating U.S.....per gal.	0 6 3	" 0 7 6
Do., black.....	0 4 9	" 0 6 6
Tar, Stockholm.....per barrel	1 2 0	" 1 5 0
Archangel.....	0 12 6	" 0 15 0
Turpentine, American...per ton	21 0 0	" 21 10 0

## Trade News.

## WAGES MOVEMENTS.

**DARLINGTON.**—On Saturday a meeting of the Darlington carpenters and joiners was held at the Raby Hotel to decide on the offer of 4d. per hour advance in wages, their application having been for 1d. It was decided by a majority to accept the employers' offer, which will come into force on April 19. The rise will bring the wages up to 8d. per hour. The building trade is now very brisk in Darlington.

Mr. Deputy Pearce Morrison laid on Wednesday the foundation-stone of the new building which is to take the place of the old Cambridge Music Hall in Commercial-street, E., destroyed by fire in January of last year. The new hall is to be in the Moorish style, of red brick, with Bath stone dressings, has been designed by Mr. Henry Percival, of Buckingham-street, Strand, and will accommodate an audience of about 2,500. The old hall only had room for about 1,800. It is to cost, with fittings and appointments, about £25,000. The building is already well advanced, and the directors hope to open it by Whit-Monday.

The Institution of Civil Engineers held their annual dinner on Wednesday night in the hall of the Merchant Taylors' Company. Mr. J. Wolfe Barry, the president, occupied the chair, and among those who took part in the proceedings were Lord George Hamilton, M.P., Mr. St. John Brodric, M.P., the Lord Chancellor, and the Speaker.

The private view of Mr. Tom Simpson's exhibition of "short-hand" water-colour sketches, including subjects in and around Greater London, Essex, and parts of the Sussex coast, will take place on Wednesday next, at the Gallery, 175, New Bond-street, and the exhibition will open to the public on the 5th inst.



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## LIST OF COMPETITIONS OPEN.

Horncastle—Stanhope Memorial, for Market-place (£300 limit).	£15 (total commission)	S. G. Overton, Secretary, 2, Manor House, Horncastle	April 16
Guernsey—States Assembly Hall (£15,000 limit)	£100, £50	N. Domaille, Supervisor of Harbour, States Offices, Guernsey	" 17
Langport—Sewerage and Sewage Disposal	£20, £10	E. G. Louch, Clerk R.D.C., Langport, Somerset	" 17
Long Buckley, Northants—Water Supply Scheme	50gs.	William Willoughby, jun., Clerk, Daventry	" 21
Halifax—Police Station and Court House (no Assessor)	£50, £15	Keighley Walton, Town Clerk, Halifax	" 30
North London—Extension of Church	No premium	— Murrow, 2, Finsbury-square, E.C.	" 30
Crompton—Public Baths (£4,000 limit)	£30, £10, £10	J. H. Mills, Clerk U.D.C., Town Hall, Shaw, near Oldham	May 1
Tonbridge—Technical Institute and Free Library (£4,000 limit)	30gs., 20gs., 10gs.	A. H. Neve, jun., Clerk U.D.C., 83, High-street, Tonbridge	" 15
Elne, France—Water Supply Scheme (3,300 inhabitants)	£100, £50, £25	La Marie, Elne, Pyrénées Orientales	July 1
Carlton, Victoria—Children's Hospital	50gs. (merged in 5 p.c.), 20gs., 10gs.	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	£20 (merged), £15, £10	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	—
Burnley—U.M.F.C. Church	No premium offered	Rev. A. J. Ellis, 38, Rectory-road, Burnley	—
Chesterfield—Brewery-street Board School (360 places)		C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Delnashough, Inveravon—Police Station	Banffshire County Council	F. D. Robertson, Architect, 92, Mid-street, Keith	April 2
Bridlington Quay—Additions, Chapel-street Premises	J. H. Dixon	J. Earnshaw, Architect, Bridlington Quay	" 2
Bowness—Bank	London and Midland Banking Co.	Jos. Pattinson, Architect, Bowness	" 2
Bradford—Alterations, Borough West Sunday School		T. Barker, Architect, 5, Bond-street, Bradford	" 3
Bradford Moor—Tinplate Works, Thornbury-street		Benj. Dobson, Architect, Tanfield Chambers, Bradford	" 3
Sleekburn—School Extension	Sheffield United Gaslight Co.	Secretary, Workshop Offices, Bedlington Colliery	" 3
Grimesthorpe—Roof, Gasworks (360ft. by 700ft.)	School Board	Hanbury Thomas, Secretary, Commercial-street, Sheffield	" 3
Pontypridd—School, Llanwood (1,135 places)	Clarke and Son	D. Milton Jones, Clerk, Pontypridd	" 3
Cork—Alterations, 6, Patrick-street		Robert Walker, Pres. S.A., 17, South Mall, Cork	" 3
Whitehall, Ballinmallard—School	W. J. Bennis	Rev. Geo. McMeel, P.P., Ballinmallard	" 3
Yarmouth—Shop-front, &c., Fuller's Hill		A. S. Hewitt, Architect, 15, King-street, Yarmouth	" 3
Elgin—Repairs, Gray's Hospital		Reed and Witter, Architects, Elgin	" 3
Workington—Alterations to Properties	J. H. Howe	C. W. Eaglesfield, Architect, Falcon-street, Workington	" 3
Cairns, N.B.—New House	Haddo Estates	Geo. Muirhead, Agent, Haddo House, Aberdeen	" 3
London, E.—Alterations to Workhouse	St. George's, East, Guardians	J. E. Braine, Clerk, Raine-street, E.	" 3
Hartburn—Nine Houses		J. Harper, 16, Park-road, Stockton-on-Tees	" 3
Pontefract—Shops	Gas Company	Tennant and Bagley, Architects, Pontefract	" 3
Nuneaton—Line Shed and Gas Works	Midland Railway Co.	P. G. Winstanley, Engineer, Gas Works, Nuneaton	" 3
Stroud—Stabling and House	G. McConnachie	Secretary, Midland Railway, Derby	" 3
Guildy Knowles, Keith—House	Jas. Russell	The Factor's Office, Fife-Keith	" 3
Garralhill, Keith—House	Jas. Keir	The Factor's Office, Fife-Keith	" 3
Cramisch Grange—House	W. George	The Factor's Office, Fife-Keith	" 3
Shielpark, Rothiemay—House		Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen	" 3
Udny—Blacksmith's House		J. Philp, Molesworth-street, Wadebridge	" 3
Wadebridge—Semi-detached Villas		Veall and Sant, Architects, 5, Avenue Chambers, Cardiff	" 5
Cardiff—Bottling Stores, Eagle Brewery	Nell and Co.	Lofthouse and Sons, Architects, Middlesbrough	" 5
Middlesbrough—Six Houses, Linthorpe Estate	J. Hollins	W. Wrigley, M.S.A., Crossley-terrace, Hebbden Bridge	" 5
Hebden Bridge—Roman Catholic Institute		Thos. Nalder, Wantage, Berks.	" 5
Wantage—Technical Department, Grammar School	Todd and Co.	H. Williams, Architect, 24, Clare-street, Bristol	" 5
Bristol—Rebuilding Warehouse and Factory, Templegate		Milnes and France, Architects, Bradford	" 5
Bradford—Reconstructing Warehouses, Canal-road		D. Storrar, Architect, Cupar-Fife	" 5
Cupar-Fife—Villa at West End	Isaac Mills	R. Lennard and Son, Architects, 10A, Cliff-street, Whitby	" 5
Hawker, Whitby—Cottages		J. F. Curwen, F.R.I.B.A., 51, Highgate, Kendal	" 5
Kendal—Bryce Memorial Institute	Geo. Hearse	H. Hearse, Architect, 22, Westbourne-grove, Cotham	" 5
Redcar—Additions to 27, High-street	Jas. Raven	Cochran and Macpherson, Advocates, 152, Union-street, Aberdeen	" 5
Easter Powis, Aberdeen—Alterations to House	Robert Smith	Cochran and Macpherson, Advocates, 152, Union-street, Aberdeen	" 5
Shanell, Aberdeen—Stading and Offices	J. and G. Young	Geo. Reavell, jun., Architect, Alnwick	" 5
Alnwick—House and Premises, Christor Bank	J. Chaney	P. M. Beaumont, Architect, Maldon, Essex	" 6
Heybridge Barn, Maldon	H.M. Commissioners of Buildings	Hon. Reginald B. Brett, Secretary, 12, Whitehall-place, S.W.	" 6
Walworth, S.E.—Postmen's Offices	Glamorganshire County Council	Wm. Tanner, County Surveyor, Swansea	" 6
Llanhilleth—Police Station		Abraham Sharp, Architect, Market-street, Bradford	" 6
Clayton—Board School	G. F. Paddock	R. Scrivenor and Sons, Architects, Hanley	" 6
Clayton—Shop, Marsh-street		F. Whitmore, Architect, 17, Duke-street, Chelmsford	" 7
Chelmsford—Pair of Villas, Primrose Hill	Wm. Rowe	Geo. Gow, Tregothnan Office, Truro	" 7
Grade—Cattle House, St. Ruon Farm	Board of Guardians	Mills and Murgatroyd, Architects, 23, Strutt-street, Manchester	" 7
Crumpsall—Alterations, Boiler House, Workhouse	Guardians	G. H. Lough, Clerk, 45, Upper North-street, Poplar	" 7
Poplar—Register Office, Upper North-street	Church Extension Board	Everard and Pick, Architects, 6, Millstone-lane, Leicester	" 7
Leicester—Mission Church, Knighton Fields		Geo. Brooke, Zetland Hotel, Huddersfield	" 7
Honley—Six Houses, Moor Bottom	Corporation	H. Harlock, Borough Surveyor, Southend	" 7
Southend-on-Sea—Gallery in Pier Pavilion		Hardy and Wight, Architects, 74, George-street, Edinburgh	" 7
Carlons, N.B.—Reflooring and Reseating Church	Wakefield R.C.C.	H. Crawshaw, Architect, Regent-street, Barnsley	" 7
Barnsley—Three Houses, Dobie-street	Guardians	H. Beaumont, Clerk, 47, Kirkgate, Wakefield	" 8
Crigglestone—Caretaker's House, Sewage Works	Committee	Charles F. Johnson, Clerk, Union Offices, Shaw Heath, Stockport	" 8
Stockport—Workhouse, Stepping Hill	Board of Guardians	Medley Hall, Architect, 29, Northgate, Halifax	" 8
Halifax—New Floor, Liberal Club	J. Wright	C. F. Johnson, Clerk, Shaw Heath, Stockport	" 8
Stockport—Workhouse, Stepping Hill	J. Wright	W. G. Jones, Architect, 3, Broadway, Woking	" 8
Farnborough—Thirteen Cottages	Barnsley Water Committee	W. G. Jones, Architect, 3, Broadway, Woking	" 8
Alldershot—Thirteen Cottages	Mrs. Hellier	J. H. Taylor, Waterworks Manager, Barnsley	" 8
Middlesex—Huts, Workshops, and Stables	Kensington & Chelsea School Managers	Rycroft and Firth, Architects, Bank Buildings, Bradford	" 9
Bradford—Three Houses, Corben-street	Corporation	Samuel Segar, Architect, Newton Abbot	" 9
Bovey Tracey—House	Joseph Brutton	J. H. Rutherglen, Clerk, Marlboro-road, Kensington	" 9
Banstead—School Enlargement	Urban District Council	W. T. Fullalove, Town Clerk, Burnley	" 10
Burnley—Memorial, Scott Park		C. and C. B. Benson, Architects, Yeovil	" 10
Eastbourne—Additions to Satara House	Manchester Co-op. Wholesale Soc.	The Clerk, U.D.C., Dawlish	" 10
Dawlish—Pier (930ft., 18ft. wide)	Police Commissioners	D. L. Jones, Architect, Llanelly	" 10
Pwll—Rebuilding Independent Chapel	Corporation	W. L. Stokes, Mulgrave-street, Limerick	" 10
Bunkey Bridge, Castle Connell—Creamery	T. Nicoll	F. W. Hingson, Archt., Portland House, 73, Basinghall-st., E.C.	" 10
Kensal Town, N.W.—Business Premises	Great Northern Railway, Ireland	G. MacLachlan, Clerk, Helensburgh	" 12
Helensburgh—Extending Pier	Aberystwith School Board	Rev. J. B. Bristow, Rector	" 12
Dunluce, Bushmills—Enlargement of Parish Church	Barnes U.D.C.	T. R. Oakley, Town Clerk, Monmouth	" 12
Monmouth—Engine House, Shaft, and Generating Station	Corporation	E. J. Toye, Architect, Derry	" 12
Londonderry—Five Houses, Park-avenue	Reading Rooms Committee	T. Morrison, Secretary, Amiens-street, Dublin	" 12
Lurgan—Station Building	Great Northern Railway, Ireland	J. Aled Jones, Clerk, Blauna, Mon.	" 12
Ebbw Vale—School (157 places)	Corporation	G. B. Tomes, Engineer, High-street, Mortlake	" 12
Mortlake—Stables at Depot	Reading Rooms Committee	F. H. Meager, Clerk, 3, Wood-street, Bath	" 12
Bath—Electric Light Buildings Extension	Great Northern Railway, Ireland	W. Jones, Aberfifrd-road, Mountain Ash	" 12
Mountain Ash—Workmen's Institute	Corporation	T. Morrison, Secretary, Amiens-street, Dublin	" 12
Belfast—Station Building, Adelaide-avenue	Board of Guardians	W. Blackshaw, Borough Surveyor, Stafford	" 12
Stafford—Alterations to Guildhall, and additions to Pumping Station	West Ham Corporation	H. F. Aveling, Clerk, 289, Harrow-road, W.	" 13
Paddington—Casual Wards, Woodfield-road	School Board	F. E. Hillary, Town Clerk, West Ham	" 13
Stratford—Sewage & Electric-Lighting Buildings, Abbey Wharf	Guardians	J. H. Hume, Clerk, Post Office Chambers, Ipswich	" 13
Ipswich—Alterations to Tower House, Tower-street		Sampson Hill, Architect, Redruth	" 14
Redruth—Workhouse Infirmary		H. Miller, Architect, Felling, Co. Durham	" 14
Felling—Rebuilding Lord Collingwood Hotel		H. O. and F. O. Piercy, The Elms, Louthorpe	" 14
Thwing—Farm Buildings	Urban District Council	Rev. Andrew Quinn, P. P., Riverstown	" 14
Riverstown—School	Rev. L. L. Davies	T. Reader Smith, Surveyor, Market-place, Kettering	" 14
Kettering—Bandstand (£100 limit)	Arnott and Co.	Alex. Shairp, Architect, Oban	" 15
Oban—Municipal Buildings	South Metropolitan School Managers	E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	" 15
Llanwornno—Rebuilding St. David's Church	Rural District Council	J. G. Phillips and Son, Architects, 61, Royal Avenue, Belfast	" 15
Belfast—Shop Extension, High-street	Cumberland County Council	J. H. Charlton, Enniskillen	" 17
Enniskillen—New House	Trustees	H. Burgess, Clerk, Brighton-road, Sutton, Surrey	" 19
Witham—School Infirmary	Holborn Board of Guardians	Jas. Villar, Architect, 1A, Cambay, Cheltenham	" 20
Tewkesbury—Fever Hospital	L.N.W. & G.W. Railways	County Surveyor, Carlisle	" 20
Walton—Stone Bridge over Camp Beck	St. Olave's Union	Rev. C. E. Norman, "Holmlea," Hythe	" 20
Hythe, Kent—Wesleyan Chapel and Schools	Corporation	H. O. Hill, Clerk, Clerkenwell-road, E.C.	" 21
Mitcham—Laundry, Baths, &c., at Workhouse		A. E. Bolton, Secretary, Paddington Station, W.	" 21
Birkenhead—Twenty-five Cottages, Hinderton-road		E. Pitts Fenton, Clerk, 30, Tanner-street, Bermondsey, S.E.	" 22
Rotherhithe—Demolition of Buildings, &c., Lower-road		H. P. Mann, Town Clerk	" 23
Chatham—Town Hall and Municipal Offices			



## BUILDINGS—continued.

Newquay—Headland Hotel	Egyptian Government	S. Trevel, F.R.I.B.A., Truro	April 30
Cairo—Native Tribunal Buildings	J. E. and T. A. Webb	Offices, Service Administratif, Public Works Ministry, Cairo	May 3
Aberbeeg—Rebuilding Hanbury Arms Hotel	Latham Jackson	Swaish and Bain, Architects, 3, Friars' Chambers, Newport, Mon.	—
Rochdale—Eight Houses, Nile-street	J. Asker	N. Mills, 67, London-street, Rochdale	—
Peterborough—House in Bedford-street	W. J. Shortland	J. G. Stallebrass, Architect, North-street, Peterborough	—
Lrthlingborough—Villa	Stanwix School Board	H. Adnitt, Architect, High-street, Rushden	—
Hooley Hill—Completing Six Cottages	School Board	J. B. Burton, Architect, 2, Guide-lane, Hooley Hill	—
Clacton-on-Sea—Three Houses, Carnarvon-road	J. Alder	T. H. Baker, Architect and Surveyor, Town Hall, Clacton-on-Sea	—
Cargo, Carlisle—Alterations to School	Board of Guardians	Joseph Graham, Architect, Bank-street, Carlisle	—
Brandon, Suffolk—Additions to High-street Schools	A. J. Cursham	Edw. Boardman and Son, Architects, Queen-street, Norwich	—
Bury, Lancs.—Methodist Free Church, Parkhills-road	Board of Guardians	J. D. Mould, F.R.I.B.A., Silver-street Chambers, Bury	—
Croydon—Pulling down Premises in George-street	Wm. Harding	A. Broad, A.R.I.B.A., 3, High-street, Croydon	—
Belfast—West Orange Hall, Shankhill-road	Co-operative Society	William Batt, Architect, Garfield Chambers, Royal-avenue, Belfast	—
Catford—Eight Terrace Houses, Beechfield-road	J. W. Jessop	Phillips and Norfolk, Architects, Catford Bridge, S.E.	—
Mansfield—Three Shops, Leeming-street	F. D. Huish	Walter Andrew, Architect, Parkstone, Dorset	—
Knaresborough—Additions to Workhouse Infirmary	Industrial Society	A. A. Gibson, Architect, Parkstone-crescent, Harrogate	—
Leadville, Prudhoe—Houses	Co-operative Society	W. Dixon, Architect, St. John-street, Newcastle-on-Tyne	—
Headingley—Billiard Room, &c.	Walt and Saville	Issitt, Adkin, and Hill, Architects, Prudential Buildings, Bradford	—
Grandisburgh, Suffolk—Rebuilding Chapel	School Board	Rev. H. D. Tooke, Grandisburgh, near Ipswich	—
Woodburn, Carrickfergus—Two Cottages	Co-operative Dairy Society	Secretary, Co. Down Manufacturing Co., Carrickfergus	—
Cadoxton—Hotel, Comet-road	—	H. Tudor Thornley, Architect, 100, St. Mary-street, Cardiff	—
Alderbury, Salisbury—Twelve-roomed Bungalow	—	F. Bath, F.R.I.B.A., Crown Chambers, Salisbury	—
Alnwick—Villa	—	J. Hope, Architect, 40, Westgate-road, Alnwick	—
Morley—Two Cottages, Houdencloough-road	—	J. Scarth, Britannia-road, Morley	—
Llanhilleth—Completing 12 Houses	—	Telford Evans, 8, Queen-street, Cardiff	—
Kendal—Houses at the Lomond	—	John Hutton, M.S.A., Kendal	—
Burmantofts, Leeds—Boot Factory, Ashley-road	—	W. A. Hobson, Architect, 92, Albion-street, Leeds	—
Leeds—Shop and Warehouse, Wellington-road	—	C. F. Wilkinson, Architect, 35, Park-square, Leeds	—
Ilkeston—Public Offices, Market Place	—	C. W. Hunt, A.R.I.B.A., Ilkeston	—
Rochdale—Ten Houses in Howarth Cross-street	—	J. Whitworth, 21, Millgate, Rochdale	—
Southampton—Avenue Congregational Church	—	E. T. Sims, Hon. Sec., Portwood Lawn, Southampton	—
Shipley—Twelve Houses, Windhill Crag	—	J. Crawshaw, Architect, 54, Otley-road, Shipley	—
Shiremoor—Five Houses	—	Davidson and Beadle, Architects, 33, Grange-street, Newcastle	—
Otley—Shed, Barras-lane	—	Fairbank and Wall, Architects, 3, Manor-square, Otley	—
Penshaw—Twenty Houses	—	Owner, Rose and Crown, New Herrington Barn	—
Tiverton-on-Avon—Schools	—	Silcock and Reay, Architects, Octagon Chambers, Bath	—
Audenshaw—Alterations, St. Stephen's Schools	—	J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	—
Ballinlirlick, Co. Sligo—Creamery	—	M. Jennings, Secretary, Ballinlirlick	—
Buckhurst Hill—Two Pairs Semi-detached Villas	—	—, Bating, 7, John-street, Adelphi, W.C.	—

## ENGINEERING.

Lymm—Gasworks Extensions	Urban District Council	R. Surtes, Manager, Gasworks, Lymm	April 5
Greystones—Water-Main Extension (390 yards)	Board of Guardians	J. D. Cope, Clerk, Greystones	7
Blairstown—Reservoir and Water Supply	Perthshire County Council	J. H. Anderson, 1, Leslie-street, Blairstown	7
Manchester—Supply of Sluice-Valves	Waterworks Committee	Secretary, Waterworks Office, Manchester	8
Fochriw—Heating Carmel Congregational Church	Rural District Council	Rev. Jas. Jones, Fochriw	10
Sturton, Alnwick—Cast-Iron Socket Pipes (360 yards, 3in.)	Provincial Administrator	H. W. Walton, Clerk, Alnwick	12
Ostend—Harbour Extension	Corporation	17, Rue des Augustins, Brussels	13
Nottingham—Meadow's Outfall Drainage	Commissioners	Arthur Brown, Borough Engineer, Nottingham	13
Lerwick—Waterworks	Urban District Council	A. Sandison, Clerk, Burgh Chambers, Lerwick	14
Buxton—Concrete Bed of Wye (1,277 yards)	Edinburgh Water Trustees	W. H. Greves, Surveyor, Buxton	14
Talla Water—Reservoir and Aqueduct	Joint Committee	Leslie and Reid, Engineers, 72, George-street, Edinburgh	14
Ashton-under-Lyne—Embankment for Greenfield Reservoir	Corporation	Secretary, Town Hall, Ashton-under-Lyne	14
Sheffield—Heating Brightside Baths	Belgian Government	City Surveyor, Sheffield	14
Ostend—New Harbour	Municipality	The Commercial Museum, Brussels	17
Brazil, St. Paulo—Lighting City by Gas	—	Department of Agriculture, S. Paulo, Brazil	30

## FENCING AND WALLS.

Surbiton—Larch Pale Fencing, King Charles-road	Urban District Council	S. Mather, Surveyor, Victoria-road, Surbiton	April 3
Derby—Boundary Wall and Fencing, Sanitary Depot	Corporation	H. F. Gadsby, Town Clerk, Derby	5
Hastings—Wrought-Iron Fence to High Bank, Ore	Rural District Council	Arthur R. Inskip, Clerk, 11, Wellington-square, Hastings	7
Castleford—Setting-back Walls, Wheldale-lane	Urban District Council	H. H. Broadbent, Clerk, Castleford	15
Ladywell, Kent—Oak Park Fencing, Slaggrave Farm	St. Olave's Union	E. Pitts Fenton, Clerk, 30, Tanner-street, Bermondsey, S.E.	22

## FURNITURE.

London, S.E.—Furniture, &c., Fever Hospital, Old Kent-road	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk House, Norfolk-st., Strand, W.C.	April 8
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## PAINTING.

Winchmore Hill—Cleaning and Painting Fever Hospital	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk-street, Strand, W.C.	April 2
London, W.—Painting, &c., Rackham-street Infirmary, Notting Hill	St. Marylebone Guardians	Henry T. Dudman, Clerk, Northumberland-st., Marylebone-rd., W.	5
Woolwich—Internal Painting, &c., Cambridge Barracks	War Department	W. G. Du Boulay, Lieut.-Col. R.E., R.E. Offices, Woolwich	7
Woolwich—Internal and External Painting, &c., Royal Artillery Barracks	War Department	W. G. Du Boulay, Lieut.-Col. R.E., R.E. Offices, Woolwich	7
Brighton—Cleaning and Painting Lamps, &c.	Town Council	Francis J. Tillstone, Clerk, Town Hall, Brighton	9
Bury, Lancs.—Stables, &c., Fernhill-yard	Corporation	John Haslam, Clerk, Corporation Offices, Bury	10
Wigan—Cleaning, Painting, &c., Market Hall and Verandahs	Corporation	J. J. Charnock, Town Clerk, Wigan	15
Bradford—Outside of Mechanics' Institute	Committee	J. Reddie, Secretary, Bradford	—

## ROADS AND STREETS.

Mansfield—Making-up Jepson's-yard	Corporation	R. F. Vallance, F.R.I.B.A., Borough Surveyor, Mansfield	April 6
Tottenham—Making-up Mattison, Page Green, & Terront Rds.	Urban District Council	Edward Crowne, Clerk, Tottenham	6
Longridge—Sewering, paving, &c., Mersey-street	Longridge Urban District Council	J. Jukes, Clerk, Council Offices, Longridge, near Preston	17
East Sheen—Roads and Sewers, Palewell Estate	H. Shepherd Cross, M.P.	F. H. Harvey, F.S.I., Estate Surveyor, 183, Lavender-hill, S.W.	—
Telford Park, Streatham—Road and Sewer	Lees Knowles, M.P.	F. H. Harvey, F.S.I., Estate Surveyor, 183, Lavender-hill, S.W.	—
Audenshaw, Lancs.—Sewering, Paving, &c., Whitehead, Church, and West-streets, Hooley Hill	District Council	J. H. Burton, 2, Guide-lane Hooley Hill	—

## SANITARY.

Newburn-on-Tyne—Sewerage (10,340 yards)	Urban District Council	G. Wilkinson, Clerk, 27, Mosley-street, Newcastle	April 2
Bardon—Main Drainage	Asby-de-la-Zouch R.D.C.	J. B. Everard, M.I.C.E., 6, Millstone-lane, Leicester	2
Daverhay—Sewerage Works	Williton Rural District Council	Thos. Joyce, Clerk, Williton, Somerset	3
Nuneaton—Sewers (500 yards, 9in. diam.)	Urban District Council	J. S. Pickering, A.M.I.C.E., Nuneaton	3
Arkenathdale—Draining, &c., Rawcroft Farm	Urban District Council	Rogers and Hudson, Solicitors, Richmond, Yorkshire	7
Rugby—21in. Main Sewer (330 yards)	Corporation	D. G. Macdonald, A.M.I.C.E., Surveyor, Rugby	8
Salford—Shelter, Latrines, &c., Recreation Ground, Peel Park	Corporation	The Mayor, Salford	8
Monmouth—Collecting Tanks and Chamber, Sewage Pumping Station	Corporation	T. B. Oakley, Town Clerk, Monmouth	12
Greenock—Outfall Sewer	Board of Police	Town Clerk, Municipal Buildings, Greenock	12
London, W.C.—Jobbing Works, Sewers and Drains (Three Years)	Strand Board of Works	The Clerk, 5, Tavistock-street, Covent Garden, W.C.	14
St. Pancras—Underground Conveniences, Mansfield-road	Vestry	W. N. Blain, Engineer, Vestry Hall, St. Pancras	19
Oporto—Drainage Works	Municipality	The President, Municipality, Oporto	July 31
Ardagh—Drainage Works at Creamery	Co-operative Dairy Society	J. Horan, M.I.C.E., 50, George-street, Limerick	—

## STEEL AND IRON.

Belfast—Mooring Chain, &c.	Belfast Harbour Commissioners	W. A. Currie, Secretary, Belfast	April 5
Salford—Ironwork and C.I. Pipes at Sewage Works	—	Saml. Brown, Clerk, Town Hall, Salford	7
London, W.—Wrought-Iron Girders, Repairs, &c., at Public Baths, Marshall-street, Golden-square	Vestry of St. James, Westminster	T. Hensman Munsey, Clerk, Vestry Hall, Piccadilly, W.	7
Leicester—Iron Flooring, &c., Aylestone-road Works	Gas & Electric Lighting Committee	Alfred Colson, M.I.C.E., Millstone-lane, Leicester	10
Lancaster—Wrought-Iron Principals and Galvanised-Iron Roof (60ft. by 30ft.)	Streets Committee	T. Cann Hughes, Clerk, Town Hall, Lancaster	14
Neston—Cast-Iron Water-Mains and Fittings (85 tons, 5in.)	Urban District Council	Surveyor, Town Hall, Neston, Chester	—

## STORES.

Thornaby-on-Tees—Materials, Stores, &c. (One Year)	Corporation	Town Clerk's Office, Town Hall, Thornaby-on-Tees	April 3
Smethwick—Stone, kerbs, bricks, &c. (One Year)	Urban District Council	Chairman, Stores Purchase Committee, Smethwick	5
Hanley—Sewerage Pipes, Macadam, Granite, Cement, &c.	Urban District Council	Joseph Lobley, Borough Engineer, Town Hall, Hanley	5
East Dereham—English Granite (300 tons, 1½in.)	Norton Rural District Council	H. G. Himson, Surveyor, Theatre-street, East Dereham	5
Norton, Yorks—Road Materials (One Year)	Rural District Council	Thomas W. Smith, Clerk, Norton	6
Fareham—Lime, Gravel, Cement, Granite, &c. (One Year)	Highways Committee	Graham Whitlock, Clerk, West-street, Fareham	6
Oxford—Stone and Stone Lime (Two Years)	—	Richard Bacon, Town Clerk, Oxford	8
Manchester—Solid Rock Haslinden Grit Setts	—	Chief Clerk, Highways Department, Town Hall, Manchester	—



**WM. OLIVER & SONS,**  
MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and FANCYWOOD  
MERCHANTS,  
120, BUNHILL ROW, LONDON, E.C.  
The most extensive Stock of every kind of  
Wood in Planks and Boards, dry and fit for  
immediate use.

TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BRISTOL.**—For the reinstatement of No. 90, West-street, for Mr. W. J. Upton. Mr. F. Bligh Bond, F.R.I.B.A., Liverpool Chambers, Corn-street, Bristol, architect. Quantities by the architect:—  
Eastbrook and Sons ... £490 0 0  
James, J. ... 489 0 0  
Lewis, T. ... 458 10 0  
Browning, J. ... 450 0 0  
Love, E. ... 397 10 0  
\* Accepted, with modifications.

**CAMBERLEY.**—For the erection of two pairs of cottages at Camberley, Surrey, for Mr. H. W. Harris. Mr. Joseph Greenaway, 19, Duke-street, Reading, architect. Quantities supplied:—  
Bottrill, J., and Son, Reading ... £1,360 0 0  
Spooner, E., Bagshot ... 1,300 0 0  
Seward, J. B., Wokingham ... 1,284 0 0  
Smith, W., Farnborough ... 1,260 0 0  
Spear and King, Crowthorne ... 1,210 0 0  
Searle, G., Reading ... 1,180 0 0  
Field, E., Camberley ... 1,154 0 0  
Fitt, E. McC., Reading ... 1,150 0 0  
Taylor, D., Reading ... 1,120 0 0  
Hawkins, W., Reading\* ... 985 0 0  
\* Revised tender (£820) accepted.

**CANNOCK.**—For repairs to the tower at West Hill Schools, for the School Board:—  
Representatives of R. Barton (accepted).  
(Lowest tender received, £69.)

**CATERHAM.**—For building a house for female attendants at the Caterham Asylum, for the Metropolitan Asylums Board. Mr. Edward T. Hall, F.R.I.B.A., architect:—  
Hipwell, S., Wisbech (accepted) ... £5,091 0 0  
(Architect's estimate, £5,000.)

**HINDHEAD, HASLEMERE.**—For entrance lodge, stables, and coach-house, for Dr. A. Conan Doyle. Mr. J. Henry Ball, A.R.I.B.A., 2, Clement's Inn, Strand, architect:—  
Light, W. R., and Son, Portsmouth (accepted).

**HANWELL, W.**—For the erection of six semi-detached villa residences on the south side of Shakespeare-road, Drayton Park. Mr. W. A. Fisher, surveyor, 16, Finsbury Circus, E.C., and Hemel Hempstead, Herts:—  
Morgan and Son, Ealing, W. ... £5,905 0 0  
Christie, Shepherd's Bush, W. ... 3,698 0 0  
Edwards, Maidenhead ... 3,660 0 0  
Davey Bros., Romford ... 3,600 0 0  
Tattersall and Co., Catford ... 3,450 0 0  
Payne and Sons, Hemel Hempstead\* ... 3,420 0 0  
\* Accepted.

**IVERNESS.**—For the erection of a range of warehouses in Academy-street, for Messrs. Strothers. Mr. William Macintosh, Union-street, Aberdeen, architect:—  
Accepted tenders.—  
Mason:—A. Junor.  
Carpenter:—P. Cameron.  
Slaters:—J. Gray and Son.  
Plumber:—A. J. Russell.  
Plasterers:—Fowler and Kennedy.  
Painter:—J. Munro.  
Blacksmiths:—The Rose Street Foundry Co., Inverness.  
**IVEGILL.**—For farmhouse at Colt Close, Ivegill, Cumberland, for Mr. J. W. Nelson. Messrs. George Watson and Son, F.I.A.S., Penrith, architects:—  
Accepted tenders.

Contract No. 1.—Masonry, &c.:—  
Lowthian, T. ... £517 16 9  
Contract No. 2.—Joinery:—  
Richardson, J., and Son ... 264 7 3  
Contract No. 3.—Slating:—  
Bailey, J. ... 65 8 6  
Contract No. 4.—Plumbing, &c.:—  
Jackson, J. ... 115 18 8  
Total ... £963 11 2

**LEEDS.**—Annual tenders for 1897-8, for the Leeds Corporation Waterworks. Mr. Thos. Hewson, M.I.C.E., Leeds, city and waterworks engineer:—  
3in. to 9in. Cast-iron pipes (about 400 tons):—  
Cochrane and Co., near Dudley ... £2,177 10 0  
Haley, E. and W. H., Bradford ... 2,027 10 0  
Staveley Coal and Iron Co., Ltd., Chesterfield ... 2,012 10 0  
Stanton Iron Works Co., Ltd., near Nottingham\* ... 1,993 5 0  
Clay Cross Co., near Chesterfield ... 1,962 18 4  
3in. to 9in. Stopcocks (about 100 tons):—  
Guest and Chrimes, Rotherham ... £168 19 0  
Whitley Partners, Leeds\* ... 141 12 0  
Glenfield Co., Ltd., Kilmarnock ... 131 11 6  
Brass castings, &c. (2,500lb.):—  
Whitley Partners, Leeds ... £85 0 0  
Jackson, J., Benson-st., Leeds ... 84 13 9  
Hepton, W., and Son, Leeds\* ... 76 7 1

Small iron castings:—  
Whitley Partners, Leeds\* per cwt. £0 7 6  
Gaskin:—  
A. ... £2 0 0 ... £0 15 0  
B. ... 1 11 6 ... 0 28 6  
Middleton, Bros., London ... 1 3 0 ... 0 9 9  
Stone, S., and Co., Leeds\* ... 1 8 0 ... 0 9 6  
Carr, C. W., Leeds ... 1 2 9 ... 0 9 6  
Brown, G., and Sons, Bramley ... 1 2 9 ... 0 9 6  
A.—White gaskin, per cwt. B.—Tarred gaskin, per cwt.  
Leather (about 500lb.):—  
Angus, G., and Co., Ltd., Leeds ... £41 15 0  
Hawksworth, South Market, Leeds ... 36 0 0  
Bellhouse, W., Leeds\* ... 32 0 0

Pig lead, &c.:—  
A. ... £0 14 0 ... £0 8 ½ ... £13 10 0  
B. ... £0 14 0 ... £0 8 ½ ... £13 10 0  
C. ... £0 14 0 ... £0 8 ½ ... £13 10 0  
Hepton, W., and Sons, Leeds—  
£0 14 0 ... £0 8 ½ ... £13 10 0  
Hanson, Dale, and Co., Huddersfield—  
£0 14 0 ... £0 8 ½ ... £13 10 0  
Russell and Co., Leeds\*—  
£0 14 0 ... £0 8 ½ ... £13 10 0  
Coulson, J., Stokes, and Co., Sheffield—  
£0 14 0 ... £0 8 ½ ... £13 10 0  
A.—Piping (about 50cwt.) B.—Block tin (about 112lb.)  
C.—Lead (about 25 tons) per ton.

Coal:—  
A. ... s. d. ... s. d.  
B. ... 7 9 ... 13 6  
Atkinson, J., and Sons, Leeds ... 6 3 ... 10 10  
Micklefield Coal and Lime Co., near Leeds ... 8 2 ... 10 6  
Lofthouse Colliery, nr. Wakefield ... 6 3 ... 10 6  
Turner, I., Armley, Leeds ... 5 11 ... 10 6  
Garforth Colliery, near Leeds\* ... 6 0 ... 10 0  
Brooks and Pickup, Leeds\* ... 6 3 ... 9 3  
Silkstone and Haigh Moor Collieries, Ltd., near Leeds\* ... 7 9 ... 9 2  
Green, A., Hunslet, Leeds ... 7 6 ... —  
Eddison, Bros., Kirkstall ... 6 3 ... —  
Beattie Bros., Hull ... —  
A.—Engine slack (about 2,000 tons), per ton. B.—Seconds coal (about 200 tons), per ton.—\* Accepted. + The Committee decided to test samples from these three firms.

Oils, Engine Tallow, and Cotton Waste:—  
A. B. C. D. E. F. G. H. I. J. K.  
Batt, T., and Co., Leeds—  
- 11 21/6 2/3 16/- 1/5 14/- 2/9 14/- -/6½ -/7½ -/9½  
Newsome, T. H., and Co., Leeds—  
- 19/- 1/9 19/- 1/8 15/- 2/- 16/- -/5½ -/6 -/10  
Clarke, B., Leeds (accepted)—  
- 21/- 2/4 13/- 1/6 16/- 2/- 17/- -/6 -/3 -/2½  
A.—Benzoline, per gallon. B.—Tallow, per cwt. C.—Gallipoli, per gallon. D.—Waste, per cwt. E.—Colza, per gallon. F.—Red lead, per cwt. G.—Castor, per gallon. H.—White lead, per cwt. I.—Paraffin, per gallon. J.—Mineral, per gallon. K.—Cylinder, per gallon.

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# THE BUILDING NEWS AND ENGINEERING JOURNAL.

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## SUPERVISION OF BUILDINGS.

AN authority on architecture has lately said that "learning to draw is only learning the use of tools," and we may expand this dictum by saying that designing a building on paper is only the instrumental means of actually fulfilling the duties and functions of an architect. He must not only design on paper, but see in what manner it can be carried into execution; in other words, he must be able to anticipate the building in the actual materials as well as to realise his design in execution. The only function by which he can do this is supervision. No longer a craftsman on the building, a sculptor, or a master mason, he can specify the materials and mode of execution, and personally superintend the work. His real power is in seeing that his design is carried out with integrity.

The supervision of buildings may be considered to fall under three heads: Materials, Construction, and Design. Under the first division all that concern the obtrusive literature of circular and catalogue, samples of brick and stone and cement, the delivery of the right goods at the building, and all the little artful dodgeries of contractors, may be included. How many buildings, otherwise respectable in design, have been sacrificed to the evasion and cunning of the contractor, who has taken care to read into the specification another interpretation to that which the architect intended, as, for instance, the "best obtainable" at the price, for the best in the market, or to water down the specification clause by the "bill of quantities" standard. Then the manufactured article—how often has it misled the architect! a specimen stone cut from another bed than that marked; bricks purposely made for inspection and testing. Has he not been sometimes cheated by sash fastenings or locks which are sent merely to keep under glass cases, and which cannot be used, or if they are, of much superior make to the goods supplied on the strength of them? The builder is an expert hand at introducing "samples." It is so easy to get a few cubes or  $\frac{1}{2}$  in. "stuff" cut up from good timber, planed and polished or stained and varnished to show the grain. These are supplied wholesale by the timber importer to the contractor, and the latter can hand them to the architect at the shortest notice. Slabs of polished marble, specimens of slates and tiles, are commonly enough sent out wholesale, but possess no more value than the "puff" or the circular. Is the architect sure that in his new terracotta front he will get the evenly burned quality, the true lines, and sharp members that he finds in the specimen sample in his office? We are afraid if he trusts too much he will be disappointed. Yet the sample of stone, or brick, or slate, or terracotta ought to be a guarantee and a better pledge than any catalogue. The architect can say: You have sent me this. Do the goods supplied bear any fair comparison with it? And the responsible firm can be trusted. The value of a test-sample ought to be above suspicion. A manufacturer sends an architect a small model, say, of an iron casement, which shows the weather bar and grooved stile, the mode of opening made in gunmetal or bronze—a highly finished and polished piece of work; but this model is by no means a guarantee of the actual casements and frames supplied. A much more satisfactory sample would be a small length of the weather-rail and section of the casement and frame cut off from

the rolled metal. In another instance the architect specified the opening lights of a conservatory on a patented system. He received a small polished brass model, inclosed in a leather case, showing the system; but, alas! the work actually executed bore very little resemblance to the model in its make or working. The sample model is very nice and instructive in a technical museum, or on the architect's mantelpiece or table; but is no guarantee. An architect specifies a certain system of fireproof flooring: he gets a model made to full size, or to some smaller scale, in which the construction and sections are clearly exhibited. But the actual floor is a very different matter. The iron joists may be spaced at greater intervals, and the concrete may be a different composition to that specified. We have known builders, when remonstrated with, say that the model was only an illustration of the method, but was not intended to be followed exactly.

Samples of materials and models of construction are unreliable as guarantees, and it is better that the architect should visit the workshop or the building yard and make his tests from materials to which he had access. To examine a load of bricks sent in the course of delivery, or the stone sawn in the mason's shop or yard, is a more likely way to detect defects than to keep in one's office samples that are specially picked out for that purpose. How to hold the contractor to his samples and tests is, after all, the chief thing. To accept a specimen of a well-made brick and to imagine that every load will be equal to sample is an easy way to satisfy one's self that you have done your duty. But how is the architect to hold the builder to his sample? He cannot be on the works every day, or even every week, to see that every load of bricks sent to the building is of equal quality. How does he know that the "shuffs" will not find their way into the walls as well as the sound bricks, or that bats will be discarded? The clean, sharp sand specified, of which a sample has been sent to the architect, may be substituted by inferior unwashed sand. How much can be done to evade the specification in wall building! The contractor who has "by accident" two qualities of cement on the job—one according to specification standard, weighing not less than 114lb. to the bushel, and capable of passing through a sieve of, say, 1,600 meshes to the square inch, and the other an inferior quality of much less weight and of coarser kind—can scarcely be blamed if his men have made the mistake of using the wrong cement. Can he be called upon to rebuild brickwork that his men have not properly flushed in with mortar at every course, and where the courses exceed in height more than the specified rule of "No four courses to exceed more than 12in. including the joints"? Even a clerk of works may find it difficult to insist on the due performance of every foot of wall, as the "flushing" or "grouting," for instance. To accept good specimens that fulfil the standard required is one thing; to see that the work is carried out in the same way is quite another. There is, as we have said, only one way—namely, to inspect the work during progress, both in the shops and on the building. But how about construction? To a large extent, the clerk of works can be intrusted with the task of examining the goods delivered, though even here he is not ubiquitous; but construction is another matter. People sometimes fancy they can conjure by a name, a clever and experienced clerk of works or foreman, or even contractor, and upon such an assurance they do not pay particular attention to how things are executed. Take, again, a wall. The right way of building a wall, whether of stone or brick, is not always the easiest or the least expensive, and the average contractor knows this only

too well. The use of "bats" and "shuffs," trifling with bond to omit the "through" stones or bonders, are temptations only too strong to be resisted by the low bidder. Is the architect sure his drawings and specification will be strictly adhered to? Has not the experience of most practitioners proved the contrary? And it seems to us this is one of the things which the architect too often leaves to someone else—his clerk of works—to see carried out. How much terracotta work is spoiled by inattention to details at the onset? Many architects omit to make detail drawings for their terracotta work: no joints are shown, the blocks are not chambered as they ought to be; any joggles, mortises, and grooves necessary are allowed to be made after the pieces are fired, and when the blocks are set all kinds of tool-work become necessary; the pieces are "coaxed" and "doctored," and a clumsy finish is the result. In mason's work equal attention is necessary, and the architect is the only person who ought to be able to direct the work. Is it the practice for him to show the beds of the stones in his details, the angle quoins, or the varieties of sizes of stone, or those of the jambs? We have known these points left to the mason or contractor—even the jointing of a mullioned window or an arch. We cannot expect, of course, a clerk of works, among his other multifarious duties, to be a judge of masonry, jointing, or the most artistic or pleasing manner of varying the beds or the sizes of stones, details of skewbacks, arches, corbels, or mullions. These are matters on which the technical skill of a mason and the art of the architect ought to combine. It is so with other trades, like that of tiling. Skilful tilers may execute a clean piece of roofing, and of even colour, but without the artistic sense of selecting the variety of tint of the tiles, managing the hips and valleys, and treating the verges. If the architect entirely leaves the work to others' judgment he cannot complain afterwards. In the carpenter and joiner's work, of all others, construction must go hand-in-hand with that sense of fitness and artistic instinct which makes all the difference between mere shop joinery and art woodwork. The specification clauses must be supplemented by detail drawings in all cases where the question of shape is important; thus, the projecting part of a wrought rafter should have a detail of the finish intended. The sections of eaves, dormer finishes, bargeboards, of half-timbering, panelling, and framed work, architraves and staircase joinery, especially balusters, handrails, and newels, require the particular care of the architect's supervision; they are finishes which no amount of delegated authority or reliance on specifications can possibly insure. What is it that differentiates the work of men of the leading school from that of Mr. Brown? Nothing but the details; the designs of such things as door and window frames, the mode and manner of panel division, the mouldings on door and architraves, the finish of dormer or eaves, all of which show a personal supervision of the profile, or the best moulding. They are not contented to specify the thickness, height, and girth of a moulding to such a thing as a skirting to a room, and to see that these particulars are carried out to the letter. Each is sketched, and the profile of moulding made and examined when in the joiner's shop before passed. The ordinary architect is satisfied if he describes the size and thickness of his doors, that it is to be moulded on one or both sides, if there are to be glass panels or diminished stiles, the mode of hanging, the size of architraves, the butts and locks, &c.; but this is not enough for the man who wishes his design to be carried out. He makes an inch-scale drawing, with full-size details and mouldings, and he sees that it is executed. In the smith's work,



plasterer's work, and other details, the same preparatory detail is undertaken, and personal supervision becomes, in consequence, necessary.

Under the general head of "Design" may be included all that has been said under the last subject, for right construction implies good design. We can hardly conceive an architect intrusting construction to his clerk of works in a perfunctory way, and only interfering with what he called "design." How can good design be compassed without the operations that lead up to it?—and yet we sometimes hear architects talking at public meetings, in which builders and clerks of works are present in large numbers, as if there was such a fundamental separation between their own and the latter's work, as if they need be men of different training and habits; in a word, as if they are artists and the latter the real builders and contractors. One speaker admitted that the clerk of works knows a great deal more about construction than the architect does, and acknowledged in a word that an architect could not overcome difficulties without the aid of his assistant. Perfectly true, no doubt, in many instances, but not anything to be admitted, theoretically, at least, without a blush. Is it not this prejudicial separation between construction and art that is so much to be deplored, and that has caused the disunion between the working and the mere paper artist? Certainly, any such admission of the difference between architect and builder is making it harder to expect any cordial reunion of the two classes; or that there is any honest meaning in the phrase we so often have on our lips, "art craftsmanship." In the province of design pure and simple the architect must necessarily be the arbiter, and no amount of conventional teaching or deference to designers of manufactured materials ought to dissuade him from enforcing his own decrees in matters of taste, of decoration, of colour, of furniture, and fabrics, which are too often placed in the hands of the commercial artist.

#### NEW ENGLISH ART CLUB.

THE modern pictures at the New English Art Club exhibition at the Dudley Gallery sustain the character of this Club for its unconventionality, and are worth a visit by all interested in this particular school of painting which has its quarters here, if for no other reason than it shows how different are the ways men look at nature. After a visit to the Royal Institute of Painters in Water Colours, the quality and attributes of the work at the Dudley may appear rather unintelligible. Here we have different kinds of "impressionism," all more or less attempts to grasp the fleeting notes of sunshine and shadow, the esoteric spirit of art in its many manifestations, the expression of nature and human life apart from their accidental associations. In this vein, sometimes of sadness and gloom, or of bright sunshine, pessimistic or hopeful, we notice the studies of artists like Bernhard Sickert, Jane Inglis, W. H. Y. Titcomb, H. B. Brabazon, Moffat Lindner, Bertram Priestman, A. Hartrick, J. E. Christie, and others. We see also the low tones of the Newlyn School, the strength of colour of the Scottish, but also much more after M. Degas, M. Monet, and other French impressionists. Take, for instance, W. H. Y. Titcomb's sketch of "Early Morning, Venice," and his "Venice in Grey" (21), one full of light and reflection on the lagoon, the other veiled in misty grey. Jane Inglis is another exponent of the higher phase of this school. Her "Sunshine and Shadow" (8), a small sketch of children in a meadow of long grass and flowers, is full of poetic charm. H. B. Brabazon has several poetical water-colour sketches of delightful breadth of handling. "On the Riviera" (10), "Near

Allassio" (13), "A Sussex Lane" (15), are mere "notes" of colour—a few strokes of a full brush put on with delightful breadth and precision, suggesting light. The works of A. W. Rich are also slight sketches done with a full brush. His sketches "Near Oxtead, Surrey" (11), "Bury Church" (20), are in the same broad style. Note the dark mass of trees in the middle distance of the first sketch, how charmingly put on against the sunny distance, or the washes of grey and green in the second subject. Rather as an elevation we must regard Walter Sickert's "St. Mark's, Venice" (9), somewhat lacking in the qualities of light and colour which we expect to see, and there is a flatness also of colour. The seascapes of Moffat Lindner are always bright and stimulating. "Christchurch Ferry" (18), "Christchurch Bay" (33), and the large picture of "Afterglow, Christchurch" (113) are all luminous and delicate studies of water, sun-lit cliffs, and cloud reflections that ought to redeem our climate from the charge of gloom. Almost Venetian-like in its brilliancy is the first of these. Even better is the view of the bay (33) with its strong-lighted chalk cliffs, its blue sea, and rose-hued cloud reflections on the still water. The same roseate tints appear on the larger work representing an afterglow effect in the sea. Strength of colour is the prevailing quality of the work of A. S. Hartrick. His "Vicariate Garden" (30), is pleasing in the rich colour of the dahlias with their green background; and his "Pansies and Sweet Peas" (60) is another clever rendering of the country garden. Admirable colour also is seen in Bertram Priestman's work, "The Harbour Mill" (41), an old windmill by the side of the harbour, painted with much feeling, and near it the late C. E. Holloway's "Limehouse Reach" is a delightful monochrome of brown-grey in sky and river, the full tide reflecting the tone of a murky sky. A well-drawn study of cows, "Milking Time," (49), and a grey seascape (55), are also by Priestman.

Turning to subject pictures and portraiture, we may see a few eccentricities in which the conventional methods of art are ignored. C. W. Furze's portrait of "Mrs. Marshall" (37), a lady in a dark figured teagown, seated on a couch of heliotrope tint, is at least natural without any of the touching-up of the professional portrait painter; in another portrait of "Mrs. Cane" (56), we have a study of a lady seated below a large, upright mirror, with hangings of violet. The drawing of the figure is less satisfying than the richness of tone, and is quite subordinate to the scheme of background. His large picture of a "Malay Woman in a Courtyard" (96), is a dark, heavy woman in ample skirt and red bodice, not prepossessing, the chequered sunlight with the bluish cast shadows are well painted. Fred Brown's "The Mirror," an undraped girl seated at the river's brink, hidden by red drapery, and Geo. Thomson's study of a dark-haired girl in bright blue evening dress, with a red rose in her hair, are rather hard studies of colour and light. The large picture at the end of gallery, by J. E. Christie, "Vanity Fair," lent by the Corporation of Glasgow (70), has undoubted claims as an example of the Scottish school. Here we see a crowd of children, youths and maidens, looking eagerly up at a girl at a fair, dressed in short skirts as "Folly," who holds up a tray of coloured baubles. Some are trying to catch the bubbles of prismatic hue, which the young fairy is throwing amongst her votaries of pleasure. The light and shadow symbolises the fleeting nature of the subject, a scythe in the hands of a man may be seen in the darker portion of the crowd. It is a strongly-painted subject, of many excellent qualities and of considerable power. "Blind Man's Buff" (47), by Henry Tonks, is open to question as to the

colour and treatment of lighting, though there is much to commend in the work. The movement and grouping of figures and the foreshortening of the central lady, who, blindfolded, is at a complete loss as to her position, and the scheme of treatment as a whole, is natural and pleasing. P. Wilson Steer's portrait of Mrs. Frederick Peagram is thoroughly unconventional; the reflection on the face and the expression are forcible. "A Freeholder," an old countryman of the labourer class, with clay pipe and a glass of beer by his side, scanning over an indenture, is full of quaint humour. We must also pay a tribute to George Thomson's capital subject, "Fowls" (104), which is painted with much skill. A figure subject, by D. Muirhead (59), "Dianeme," is strong in the chiaroscuro and colour. In passing, also, we must note the large landscape by J. Buxton Knight, "Autumn's Threshold" rich in warm colour, with the river winding through a woodland. "A Grey Day, Salta Moss" (99), by Oliver Hall, R.E., must be mentioned for the delicate grey tones of the marsh, and its handling. Mary Hogarth has a nice sunlight view in Venice, entitled "August," in which the reflection of the stately church in the blue sea is pleasingly painted, and other subjects by Francis Bate, Moffat Lindner (110), A. Muhrman (81), notably his street scene, "Gunnersbury" (85), may be mentioned. The exhibition is a proof of the existence of a phase of painting which cannot become popular. The public taste is not very likely to give up the old traditions of English art, and its careful handling of subjects according to conventional rules of composition and colour; but whatever may be thought of these works of the younger and more advanced school of painters, there is little doubt, despite their eccentricities, they afford food for thought, and amongst them much that is original and healthful may be found, that places the art on a higher plane than mere transcriptive excellence.

#### THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of the Association was held at 9, Conduit-street, W., on Friday evening, Mr. W. Howard Seth-Smith, F.R.I.B.A., Vice-president, in the chair. Messrs. W. M. How and W. H. Purchase were elected members. A vote of thanks was passed to Mr. H. Greville Montgomery for granting free admission to and hospitably offering the members tea at the recent Building Trades Exhibition on Saturday, March 20. The President read the "house list" of nominations for officers and committee for the ensuing session drawn up by the Committee, and explained that further nominations would be received up to and including that day four weeks, Friday, April 30. The name suggested for the presidency in this list is that of Mr. Hampden W. Pratt, and the announcement was greeted with a hearty round of applause; Messrs. Banister Flight Fletcher and Alfred H. Hart are proposed as vice-presidents; Messrs. E. Howley Sim and G. B. Carvill as hon. secretaries; and for the ten places on the committee sixteen names are enrolled.

#### ARCHITECTURE IN RELATION TO THE HANDICRAFTS.

The following paper on this subject was read by Mr. T. G. JACKSON, R.A.:

It used to be the fashion for anyone writing or speaking on architecture to cite Vitruvius as the authority for what he said. The writings of Vitruvius are no longer regarded by everybody as the gospel of architecture, and, indeed, are now perhaps rarely read by architectural students. And yet, on the present occasion, I cannot do better than take as a text the opening passages of his treatise, which seem to apply very aptly to the subject for discussion to-night. Vitruvius distinguishes at the outset between practice and theory in architecture, and goes on to point out that architects who are mere handicraftsmen without literary training are unable to give any reason for what they do, while those who trust only to theory and book learning without



practical training seem to grasp at a shadow, and not reality. An architect, he says, must be properly trained in both fields. He must be both ingenious and teachable, for neither will wit without training nor training without wit make the perfect artist. He must be a skilful draughtsman, a learned geometrician, not ignorant of optics, instructed in arithmetic, a good historian, and a diligent student of philosophy. He must understand music; he must know something of medicine; he must be familiar with the decisions of the lawyers; he must understand astrology and astronomy. This is a formidable programme, and if one may, without profanity, speak disrespectfully of a writer who has hitherto been considered almost sacred, one would be tempted to say he was writing nonsense. The first part of his list is, no doubt, necessary enough, and as to the latter part, when we come to his explanations, we find that they do not make so much demand on the student as at first sight they seem to do. The usefulness of his historical lore is to enable the architect to explain the meaning of some of his ornaments, and to tell the inquirer that the figures of Caryatides which were used as columns were derived from the matrons of Caryas, a Peloponnesian city, who were carried into slavery because their country had sided with the Persians against the Greeks. Philosophy is needful to him only in the same way that it is needful to everybody—to prevent him from being arrogant, and make him just, honest, and temperate. As for music, he seems to require it principally for testing, by the note they give, the strain of the ropes of catapults and military engines. His knowledge of medicine should be sufficient to guide him to avoid unwholesome sites and bad water. As for his knowledge of law, Vitruvius seems to think he ought always to be an expert in questions of party-walls, rights of drainage, and light and air. After this long enumeration of matters requisite for an architect, Vitruvius draws the line. Pytheas, the architect of the Temple of Minerva at Priene, had said that an architect should be able to excel in all the arts, and in each to surpass those who made that art their especial study. Vitruvius thinks Pytheas goes a great deal too far. An architect, he says, neither need be, nor can be, such a grammarian as Aristarchus, but he must not be unlettered; he need not be a musician like Aristoxenus, but he must not be without musical sense; nor need he be a painter like Apelles, but he must not be unskilled in drawing; nor need he be a sculptor like Myron or Polycleus, but he must not be ignorant of the plastic art; nor, finally, has he to be a doctor like Hippocrates, but he must not be without knowledge of the laws of health; nor in other studies need he excel as a specialist, but he must not be wholly unskilled in any of them. To say that architects should excel in all these things is to demand an impossibility, because it is only now and then that a man can excel in one art even if he pursues no other. Pytheas, therefore, is clearly wrong, and has gone astray, because he has not made a proper distinction between practice and theory. Therefore, says Vitruvius, he seems to have done quite enough in these several branches of study who has a fair knowledge of those parts and theories of them which are necessary to architecture, so that if he should be called upon to pass judgment upon or to approve these matters and arts he should not be found wanting. Vitruvius, therefore, waters down, as he goes on, the somewhat strong dose which at first he seems determined to administer to the student of architecture, as a tonic necessary to his constitutional well being. A general theoretical knowledge of the various crafts which it will be his business to direct, sufficient familiarity with them all to prevent his passing indifferent work on the part of those who work under him, seem to be the measure of the practical requirements necessary to an architect, according to the Roman authority. On the other hand, we have the dictum of the Greek architect, Pytheas, who says that the architect must not only have this general theoretical knowledge, but must be actually skilled in the practice of all the arts which he has to deal with; and not only that, but superior in each one of them to the specialist who follows only that single art. Which of the two is to be our guide? Shall we be satisfied to be proficient in the theory of our art, learning it from books and lectures, and merely acquainting ourselves with practical work in a general way, enough to enable us to understand our specifications, and order the work properly,

and detect flagrant instances of inferior workmanship and bad material; or are we, with Pytheas, to put our hands to the work ourselves, and not only design but help to execute it—to train ourselves to be master craftsmen as well as superintendents and directors of other men's labour? For many generations past the former of the two methods has been the order of the day. Most of us who have reached or passed middle age have been brought up under it, and if we have, to any extent, departed from it, it has been of our own initiation that we have done so. That this plan was not that in vogue during the best periods of modern European art is well known. It was not in that way that the architects or building-artists of the Renaissance, in its earlier and more independent days, or those of the Middle Ages worked. They would have been at a loss how to go on if you had parted them from their building and their workmen, and shut them up with a drawing-board and a T-square, and asked them to make their designs and convey their instructions by means solely of drawings. Their method was that of Pytheas rather than that of Vitruvius, whose gospel, fortunately, had not in their day obtained currency, or been placed on the canon of inspired authorship. I need not tell you that of late years there has been a revulsion against what I will call the Roman method of practising architecture in favour of the Greek. Many of us have been preaching against the strictly professional view of architecture, and urging that a man cannot be expected to produce good designs who seldom or never comes into contact with the materials out of which his designs have to be constructed. We have argued that it is from the handling of material that suggestions in design can most readily be gathered. That reading about processes in building, or any of the arts which go to make up a building, will never teach a man how to make the most of his opportunity, how to use his material to the best advantage, how to economise labour so as to avoid wasting it to no purpose, and how to design in accordance with the natural qualities of stone, iron, or wood with which he has to deal. We have tried to impress on the student that an hour spent in the workshop or on the scaffolding will often teach him more than a week spent in a library. We have gone still further, and tried to persuade students not only to go and see how things are done, but actually to put their own hands to the work, and to become handicraftsmen in one or more of the many arts with which, as architects, it is incumbent on them to be familiar, and of which it is necessary the technicalities should be understood by anyone who undertakes to design for them. These proposals, however revolutionary they appear to the advocates of the old-established professional system, according to which architecture has so long been practised among us, are still, it is clear, very far from bringing us again to the methods of the architects of four hundred or five hundred years ago, to say nothing of those of the Greek architect whose demands seem to Vitruvius so extravagant. The contracts which bishops and chapters and others who intended building on an important scale made with their architects bound them down rigidly to a much more constant and intimate association with their work than a modern architect would submit to. The architect bound himself to come with his family and live in the place where he was to build, to engage workmen, and see that they did all that was necessary to be done, to work with his own hands, both in building and in sculpturing, as befitted a good sculptor and a master of the art of stone-cutting. He was also to go to the quarries as often as was necessary, and arrange for the quarrying of the stone. Furthermore, he was bound for the term of so many years, during which the building was to be constructed, not to undertake any other work without the special leave of his employers, or a majority of them, or if he were engaged on some other building in the same or a neighbouring place, the time he should devote to each was strictly specified. Finally, he bound himself to supervise as chief master-builder and superintendent all the labourers, builders, master workmen, and handicraftsmen employed on the building, and to supply them with such dimensions, orders, and methods as would be required during the progress of the works. For all this he was to receive a fixed annual salary, to which was sometimes added a gown or two gowns in the year, and perhaps a house was provided for him to live in with his

family. The architect of those days, therefore, was a superior clerk of works, as we should call him, with this radical difference: that he had no master over him, sitting most of his time in an office perhaps 100 miles away, directing him by the penny post what to do, and sending him drawings to show him how to do it. Imagine a modern clerk of works to have had the training of an architect as well as that of a tradesman in one of the handicrafts—that is to say, to have the skill to design the work he directs; or, what is the same thing, imagine a modern architect to have learned one or more of the manual trades, and to choose to go and superintend one of his own buildings as his own clerk of works, and you have the nearest approach to the architect who designed and raised the mighty structures of the past, which it is our aim to rival, and our despair to surpass. He would necessarily be a mason to begin with, for masonry is the king of all the trades, the one which all the rest follow, and the one which, blending itself, as it does, imperceptibly with sculpture—which is but a refinement of masonry—passes without any visible or marked transition into the higher region of fine art. In olden time sculptors and architects were the same persons; or, at least, though there were sculptors who were not architects, there were probably no architects who were not sculptors capable of designing the carved work of their buildings, and of executing the most important parts of it—notably the figure-work—with their own hands. Let us for a few minutes try to realise in our own persons what it would be like to practise architecture after this fashion. Let us shut our eyes to the present, and try to open them again in the days of, say, Henry VI. or Lorenzo dei Medici. The dingy office in a London street vanishes from our sight. Away go the high stools, the drawing-boards, the dusty piles and rolls of paper, for—oh! blessed release—there will be no more working drawings to make, and little drawing of any kind whatever. The office-bell will no longer send a shock through our nerves, announcing the coming of a visitor to interrupt us at the most critical period of a design. The approach of post-time will no longer drive us into a frenzy to get off arrears of correspondence that cannot be postponed any longer, for we shall have little reason to write to anyone. Our employers will be on the spot with ourselves, and an occasional conference on the building itself will make much letter-writing unnecessary. Away, too, goes all that tedious necessity of long railway journeys which dissipate our time, and exhaust perhaps four hours in travelling for every hour we have to spend on the work at the end of it. Our work will now be all under our eyes, or near at hand, and the hours wasted in the railway carriage will be employed to good purpose on our growing building. Away, too, go the long specifications, the contracts with builders, the lynx-like supervision required to keep their performance up to their engagements, for we shall either be our own contractors, or else have workmen under us employed and paid directly by the (our own) employer. Relieved of all these official and commercial occupations in which I venture to say most of us—do what we will—find half, and more than half, our time spent, we shall pass our working days clad in the workman's blouse, setting out our work on the ground, drawing such simple diagrams as will give the workman the proportions and dimensions of the several parts, marking out the mason's moulds, perhaps taking the mallet and chisel out of his hand to show him practically how we want certain parts finished, trying on the building itself as we can nowhere else the scale and proper character of our sculptured ornament, without doubt doing so much of it ourselves as will give the clue to the subordinate carvers, and probably finishing some of the most important parts with our own hands. Conceive the sureness and confidence with which we should work. There would be none of that experimental and hesitating anxiety which makes us doubt after drawing out a design whether it will come out as we intend in actual execution. No! there is the building itself on which to try experiments. When the thing is going wrong we can stop it at once and correct our original device and substitute something better, and there will be no contractor to worry us for an "extra" on the inevitable plea that the new way is more expensive than that for which he contracted. And so our building will rise, and as it nears completion, and the scaffolding comes



down, and we stand with hands behind us, and head thrown back, to see our creation as it emerges in its maiden whiteness from the enveloping veil of poles and planks, we shall feel that it is indeed our creation, the work of our own brain, and in a measure of our own hands, in a way that no architect can quite feel now about any of his creations, however much pains he may have devoted to them. This, gentlemen, I venture to think, will appear in the eyes of many of you—certainly to the younger men among you in whose bosoms the stirrings of art have all their youthful freshness—an attractive picture. Can we realise it at the present day? Or, if that is impossible, how near can we get to it? Can we get back to it? Well, of course, we cannot do it in a hurry. But can we expect ever to get back to the old system at all? I think not. It would be putting the hands of time back too far. Changes of system do not come about without some reason in the natures of things and of men, and to neglect the conditions of modern life in art while we admit their supreme influence in other fields would be not only impractical but unphilosophical. Take, for instance, the matter of working drawings. The drawings used in olden time were of the slightest and most conventional kind. Even in Wren's time working drawings such as we make for every detail were not found necessary when competent workmen were employed. When sending his small scale plans and directions for the library at Trinity College, Cambridge, Wren adds, "I suppose you have good masons; however, I would willingly take a further pains to give all the mouldings in great; we are scrupulous in small matters, and you must pardon us, the architects are as great pedants as critics and heralds." In his day there were trained schools of masons and joiners who had traditions of their own, and could be trusted to apply them. The architect gave them the size of the door, the scale and amount of ornament he wished to use in the doorcase, and the workman had sufficient skill to fill up the details of the sketch and to realise the architect's intentions as he would have them. So with the masons: to give them the moulding in great would, Wren seems to imply, be unnecessary if the men were good craftsmen. But where are the workmen nowadays who could be trusted to do this? It is easy to imagine the result if we tried the experiment. There are very many architects who do try the experiment of dispensing with working drawings, not from any desire to return to the older system of work as being better, but simply from the wish to save themselves trouble, or else in order to save their time for more lucrative occupations which have little or nothing to do with architecture. Some of them employ a ghost, and the ghost naturally takes little interest in a work which is neither his entirely, nor anybody's entirely, and the details come off badly. Others dispense with the ghost, and leave all the details to a contractor. One builder told me that when he applied to an architect for details of a certain work, the only answer he got was: "Take it and do it, and don't bother me about it." In another case the builder told me the only full-size details furnished him by the architect of a building which cost £6,000 were those of a cellar door and a coal-shoot, and that he—the builder—himself made all the other working drawings, and did not even go through the form of showing them to the architect. Now I need not tell you that, whatever may have been the case in the days of Sir Christopher Wren, there is no school of workmen nowadays capable of filling in the details on a general design given them by an architect. Nor need I tell you that it is on the details of a design that its success depends for its ultimate appreciation, no less than on the general conception; for no grandeur of idea, or originality of scheme, will make a good building if it is badly carried out in its details. An amateur may and often does have good conceptions in the mass, but it is only the artist who can carry them out into execution successfully, because he alone is capable of contriving the parts out of which the whole general idea is built up. It may be imagined, therefore, what kind of architecture results from the method I have described when the nominal architect gives only the rough idea of the building, and leaves the details to the men who had no artistic training whatever. Indeed, there is no need for imagination in the case, for the streets of London are lined with buildings erected on this

system, expensive and costly buildings very commonly, for the worst modern architecture is the most gorgeously decorated, and lavish expenditure on ornament is the last resource of an incompetent designer. But if neither builder nor workman can be trusted to supply proper details for the carrying out of an architectural design, what conclusion is left to us but that they must be done by the architect? How is he to supply them? Of course, he might, like the old men, go and live on the work, and give the details to the workmen by word of mouth, or by example, or by setting out the moulds and dimensions with his own hands. I do not know how many of you are prepared to follow your craft in this way. You would only be able to look after one, or, at the most, two or three, buildings at a time, and though you would save the expense of an office, I fear 5 per cent. would not enable you to earn much more than a bare livelihood. Drawings, I fear, are, and must remain, a necessity if an architect is to have his designs carried out as he intends, and if he wishes to have full justice done to them. Again, there are many buildings in modern times involving intricacies of plan which must be carefully plotted on paper, and could be contrived in no other way. Old buildings were very simple, and in their plans there was very little variety. One manor house was arranged very like another manor house, and one cathedral or church on much the same general lines as another. Those buildings of our own day which retain this simplicity of plan could be built without drawings just as the old ones were. It would be easy enough to build a great church from foundations to cap-stone of spire without a single drawing but such rough diagrams as the designer would need to enable him to put the parts of his building together. But when we come to such elaborate buildings as the modern town halls, or technical schools, or boarding-houses of our public schools, or theatres, or when we have to deal with confined and scantily-lit sites, as in the streets of London, careful and elaborate plans are a necessity, and the drawing-office is indispensable. There is no prospect whatever of our being able to build in the future without drawings, and we may dismiss as impracticable all hope of superseding them by supervision and direction on the spot, and of being able to shut up our offices and take to the building sheds and the scaffolding. But admitting all this—acknowledging, as I fear we must, that the necessities of modern system are too strong for us, and that we must, in the main, go on as we are now doing—is there nothing we can do to place ourselves more in touch with the handicrafts? If we cannot go the whole way, may we not go part of the way to meet those workmen on a common footing with whom, whether indirectly or directly, we cannot help co-operating in the carrying out of our designs? If we cannot, as Pytheas would have us, excel in all the arts, so as to surpass in each one of them the skilled workman who has followed that one alone, and made himself master of it, surely we may, without being unreasonable, demand of our architects that they shall at least not design things without knowing how they are to be made. Nor, if it is unreasonable to ask us to be better masons, better joiners and carpenters, better smiths, and better plasterers than the men who follow those callings and do nothing else, is it unreasonable to demand that every architect should so far familiarise himself, by actual observation and inquiry, with every one of these trades that he may know how to make designs suitable to the material employed and the way of employing it? And yet we are all our lives designing things without knowing how they are made. How it is possible we should not, in our ignorance, give a world of unnecessary trouble to the workman, cause a deal of needless expense to our employer, and miss altogether that propriety in design which arises from proper use of material, because the proper use of it is unknown to us. Take, for instance, the case of wrought-iron work. Every architect is called upon constantly to design such simple things as railings, grilles, balustrades, in that material. He draws, probably, something after good examples that he has seen; perhaps he tries to improve on them and design something new, and if he knows nothing of smiths' work except from books and drawings and such sketches as he has made of his own, the alterations he makes very likely make what was very easy into something very difficult, if not impossible; and even if the workman gets

over the difficulty by some troublesome device of his own, the labour involved is thrown away, and might have been saved by a little knowledge on the part of the designer. Those who have only designed ironwork on paper, and never seen it made, would be astounded to find how very differently it was done from what might have been imagined, and how very much more simply their design might have been done by altering it a little. I wonder how many in this room have any idea how so simple a thing as the ordinary forked baluster is made, with one foot to be let into the stone for each pair of balusters. I confess I did not know till the other day, when I wished to vary the form of a thing so as to give it a little more character, but began to doubt, as I went on, whether the smith could make it. So I went to the forge and had some experiments made, and found that the usual process was quite unlike what I had imagined. Another advantage of the visit was that I was able to suggest to the smith other ways of doing it, and before we finished we had made a forked baluster in four different ways, and found out which was the easiest and cheapest. This seemed to me an instance of the way in which designer and workman can help one another; the designer, from habit, seeing his way to fresh possibilities, while the workman, from habit, had not thought of doing anything but what he was used to. Let it be a rule, therefore, with every architect never to design anything without knowing whether his design is practicable, and practicable according to the received traditions of the craft concerned. But may we go no further than this? May we not require that he should be able to put his own hand to the work as a handicraftsman in one or more of the trades over which he has to exercise control in the ordinary discharge of his duties? There are some trades of which it is obvious such knowledge as an architect can derive from observation is enough. Going through the trades in the specification according to their order, we begin with excavator. It is, I think, obvious that he would not improve himself in architecture by going to work in the trenches with pick, shovel, and wheelbarrow. Next comes bricklayer and waller. I once built a brick wall, but I do not know that I learned much from it, except that bricklaying was not so easy as it looked, and that if it was hard to keep a true upright, it was still harder to keep a true level. The bricklayer to whom I showed my wall when it was done could only say that he thought it strong but very ugly. I do not know that I should advise any of you to follow my example. Carpentry and joinery are more within the reach of every one, and a course of training at the bench may safely be recommended to all who have to do with building as supremely useful. I need not go through all the trades; but masonry brings us near to the very centre of architecture. To be a practical mason would not in my opinion be so useful an accomplishment for an architect as skill in joiner's work. The ordinary problems of stone-cutting can, I think, be understood without actually handling the chisel and mallet. But masonry, as I have said, melts insensibly into sculpture, and it is not always easy to say where masonry ends and sculpture begins. What will you do when you come to the carving of your building, as, of course, come you must in a building of any importance? If you only care for quantity and not for quality you can, of course, leave it, as many do, to the carver, and simply get an estimate and leave him to do his best, which in that case may be also his worst. But you will not, I am sure, if you are in earnest, be content with so perfunctory and vicarious a way of bestowing on your work its principal adornment. You will have your own notions of the scale, the character, and the finish of your carved work; you will feel that the outline of your sculptured capitals is as important as the profile of your mouldings; that the play of light and shade in your foliated stringcourse or your enriched frieze was an important element in your design; you will desire for your sculpture an historical character, illustrating the purpose and circumstances of your building; and, above all, you will feel that the same feeling which you have impressed on the purely architectural part of your design must be carried into the sculptured decoration, or the unity of the effect will be marred. You must impress yourself on that as you have done on the rest. How are you to do this? You may, spend hours standing over the sculptor or watching him model



what is afterwards to be carved, and tire both him and yourself by suggestions and counter-suggestions which perhaps end in mere mediocrity and dullness, because though both of you want something different you do not want the same thing, and are unable to explain your meaning to one another. But if you were able to finger the clay yourself you could realise to yourself your own intention, and explain it to him perfectly, and in this way you would succeed in getting what you want as you can in no other. Every architectural student, therefore, ought to learn to model. He will find it of the greatest service to him in his future career, not only in enabling him to explain his meaning to those artists who will collaborate with him, but also in fixing and correcting his own loose ideas of sculptured decoration, and helping him to secure for it that character which will correspond to his intention. If he goes on to carve so much the better; for my part, I should like to see the callings of sculptor and architect rolled into one. As to the other crafts, time forbids me to speak more at length. Every man, be he artist or not, should, as with the ancient Jews, be taught some handicraft; and to us architects such an accomplishment would naturally be doubly useful. We cannot expect that an architect should have actual manual experience of them all; still less can we require, with the Greek writer, that he should have mastered them all. But we have a right to demand that he shall by actual observation acquaint himself with the methods and difficulties of them all, not from books but from the workmen, not in the library but in the workshop. Let him never make a design without knowing how it will be carried out, and if in doubt let him go with it to the workshop, the building shed, or the forge; let him consult the men who are to make it, and then correct or alter his design to suit the difficulties of material and workmanship. In this way we may expect to infuse a new life into our architecture, and to awake it from its torpor. The knowledge you will acquire in this way will not be of a kind to be tested by examination, or to enable you to win prizes and scholarships, but you may feel assured it will be the means of making you better artists individually, and of advancing the art of your country as a whole.

In opening the discussion on the lecture, Mr. OWEN FLEMING expressed the pleasure with which he had listened to Mr. Jackson's most able enunciation of the problems which faced the modern architect who was anxious to do his duty, and to put into his work the same spirit which we find in old examples, and the lack of which we deplored in most contemporary buildings. They all realised the great difficulties which lay in the way of any return to the almost idyllic conditions of Mediæval architects, but they had been manfully met and vanquished by some. Mr. Detmar Blow, for example, had on the completion of pupillage entered the service of a firm of masons, and there were a few other architects whom one could count on one's fingers who had taken a similar self-denying course. But having regard to the growing intricacies of modern planning, the numerous requirements, and the problem of getting an estimate before beginning to build—an almost impossible matter—it was, he feared, impracticable to go back to the old ways. But they could do something, and if they looked back on what had been done by that Association during the past eight or nine years they had reason for hope as to the future. The old voluntary system of education had been changed, under the organising powers of Mr. Leonard Stokes and others, into the present classes and studies, but after a while the promoters saw that they had been mistaken in not making the new educational scheme sufficiently practical. A conference was held, at which a change was suggested which would have made the scheme successful; but the action of those who suggested a *modus vivendi* was misunderstood, and many of those who had done yeoman service to the Association were given their *congé*, and a kind of modified *Ecole des Beaux Arts* was tried. However, an effort was now being made in the School of Design and Handicraft to carry forward a more practical scheme of education, and among the committee of visitors were the lecturer and Messrs. W. R. Lethaby, E. S. Prior, Halsey Ricardo, C. F. A. Voysey, and others. They decided last year in this school to take one building and work at it throughout the session. The experiment was fairly successful, and this year it had been further developed, and they were, he thought, at last on a road which

was leading them more nearly in the direction in which they wanted to go—they were now studying materials, and not past forms. The drawings executed in the school were simple diagrams illustrating how the students thought those materials ought to be treated. The students had been working, by the kindness of Mr. Lethaby, in stone and lead at the School of Arts and Crafts. The Association was, he believed, arriving at one of the most critical periods of its history; there was going to be a struggle between the academical and the practical, and he would say to all students: Just go through the R.I.B.A. examination, and having passed it, devote yourself to real architectural building in close association with the Arts and Crafts School. He proposed a cordial vote of thanks to Mr. Jackson for his valuable and suggestive address.

Mr. HAMPDEN W. PRATT, in seconding the motion, remarked that Mr. Jackson had very clearly and moderately indicated what architects should undertake in the shape of handicraft. They were being more and more led to believe that the architect's training was not complete unless he possessed a practical knowledge of every trade, but Mr. Jackson had reduced the requirement to the point that every architect should have been taught some one handicraft. The tendency of the present mode of training was to give the student a smattering of many trades in an amateurish sort of way. For himself, he thought that if the architectural student were to take up the practice of carpentry or masonry, he would fulfil all the requirements which could be reasonably expected of him, and, indeed, all that he could afford time for. The Association had not yet accomplished much in this way, but they were now moving in the right direction. The modelling class was very useful, and was well-conducted by Mr. E. W. Pomeroy; any proposal to provide carpentry shops and masons' shed, although ideally good, would be beyond the reach of the Association, but they might possibly be provided elsewhere. Next to working in a workshop there was a decided advantage in visiting them, and although there were obvious difficulties in arranging for such meetings during working hours, such a proposal ought to be considered and adopted. He was glad to hear Mr. Jackson demolish the suggestion that an architect had no business to make drawings; the lecturer had looked at the matter in a commonsense way; the only practical mode of expressing his wishes was for the architect to make detailed drawings on paper. If students were following Mr. Jackson's method of relying on observation of workers it would go a long way towards realising the ideal training for an architect. In the past men confined their attention to one or two works at a time, and this plan was even now adopted on large undertakings; when Holloway College, for example, was being built Mr. W. H. Crossland lived on the site. If this were more generally adopted there would be a redistribution of commissions at which the majority of men in the profession would not grumble.

Mr. C. H. BRODIE suggested that there was a middle course which the young architect might adopt with advantage—he might not have the opportunity of becoming an actual workman, but he could engage himself on the expiration of his pupillage as a clerk of works, and so watch the progress of a building from foundations to roof top. It was well known that engineers were better qualified practically for the very reason that they spent more time on the actual works.

Mr. B. F. FLETCHER said the lecturer's views had been more moderately expressed than they had expected, and certainly less stringent than those laid down in a certain well-known book. As to the historical part of the subject, the difficulty was to ascertain who Mediæval architects were and what they really did. There was an intellectual element which we failed to get at from want of documentary evidence, and we also lived under very different conditions. The second part of Mr. Jackson's paper, dealing with the knowledge of materials, was of general interest; the point on which they would differ was how architects should gain that knowledge. There was no evidence to him that it was actually necessary to work at any trade; the students would, he thought, do well to visit a workshop and use their powers of observation. There was no evidence that the greatest architects of the last two centuries—Wren, Pugin, Barry, Scott, or Street—ever hammered at a piece of iron or did any actual carving. He hardly understood

how Mr. Fleming proposed to design without having recourse to past forms. As to academical v. practical training, he was always on his guard when he heard a man described as practical, for he never found a man of that stamp worth anything. Unless a young architect looked at his work from a commonsense point of view, he could not get a second opportunity of putting his grand ideas into practice. It was essential that an architect should also be a man of business.

Mr. E. W. ALLFREY, B.A., said the question arose, How far should an architect go in his knowledge of the crafts? He needed to have a wide, general knowledge, and needed to be able to say where workmen were at fault, and put them straight. It was a question at what age a student should begin his training as architect. Speaking personally, a University career tended to give the professional man a rather late start in life. A good knowledge of materials was to be gained in the Association modelling classes.

The CHAIRMAN, in putting the vote of thanks, referred to the admirable, moderate, and fresh character of the paper to which they had listened. He did not understand what Mr. Fleming meant by the great struggle he predicted as coming on at the Association, for he saw no signs of such a thing; their curriculum was becoming more and more practical, and more on the lines Mr. Jackson had advocated. He could not point to anything better as an example than Mr. Jackson's own works. If a young architect went into a joinery shop, nothing less than a twelvemonth would be of any benefit; but a still better course was the combination of design and handicraft provided by the Association.

Mr. JACKSON, in replying to the vote of thanks, which was carried by acclamation, said Mr. Fleming's account of what the Association was doing was quite in accordance with his own knowledge of its history. The Association was one of the most useful institutions they had, for it had always taken a practical view of its duties, and was here carrying them out on the best practical lines. As to getting access to workshops, the Birmingham Municipal School of Art, under Mr. E. R. Taylor, had established schools with facilities for such visits. The student should endeavour to gain experience as a clerk of works or under such a man; he had never known young men fail to benefit by such a course. Mr. Fletcher had doubted on historical grounds whether throughout the Mediæval period the workman-architect element was as strong as had been suggested. The whole question was, he confessed, very mysterious; but they had certain men recorded as architects, some of whom were men of means and others officers of State, who could not have personally designed the buildings, which must have been done by skilled men. In the days of William of Wykeham he supposed that the practical man was the real architect. The late Viollet-le-Duc was an instance of an architect who was a practical craftsman in masonry. His friend and pupil, Mr. Allfrey himself, was an illustration of the advantage University training was to the architect.

#### CONSTRUCTION OF ARCHES IN CONCRETE.—III.

BEFORE passing on to the consideration of the next larger span of arches in concrete experimented upon there are several details in connection with the unit span of 4ft. 6in., fully described and illustrated in our two previous articles, which are deserving of attention. In one sense, perhaps, the testing of these dwarf arches may be regarded as absolutely more searching, more complete—in a word, more thorough—than many of those of far larger dimensions, subsequently submitted to similar trials; owing to their comparatively insignificant length between bearings the 4ft. 6in. arches were uniformly loaded all over; that is, each half-arch was subjected to exactly the same aggregate weight as its fellow. When the weights or loading reached a total of  $\frac{1}{8}$ th ton per square foot, the iron joists and ties became distorted, and rendered necessary the strengthening and stiffening arrangement already recorded. The testing-load was pushed to the limit of  $\frac{1}{4}$ th ton per same unit of area when the two arches built of special brick collapsed, but the remaining brick arches, as well as the one constructed of concrete, stood the test completely uninjured. In comparing the two arches, the one built with longitudinal and the other with annular joints, the latter were found to exhibit rather smaller disturbances at the crown than the



former. This discrepancy was probably due to the fact that in the annular joint arrangement there are a lesser number of joints concentric to the rate of curvature of the arch than when the longitudinal system is adhered to. So far as the deflections at the crown of the arches were observed, which, it must be kept in view, were very small, there was no practical difference between those occurring in the brick and the concrete arch. It will at once be asked, Where, then, does the latter show any superiority, any advantage, in fact? Its superiority consists in the far smaller depth which can be given to it. The experiments proved that an arch constructed in simply concrete, well rammed, was equally solid and strong as an arch built of brick with a depth or thickness nearly double what was given to the former structure. The mean of the various thicknesses of all the brick arches, rejecting the two which failed, amounted to 5.6 in., whereas the depth of the arch of concrete was exactly 3 in. The precise proportion was as 28 to 15, the dimensions being measured at the crown of the arches; one part of Portland cement was mixed with five parts of sharp, clean sand to form the concrete, which, as an arch, weighed very considerably less than its rival built of brick.

In carrying out the experiments with the next series of arches, having spans of 9 ft., or just double that of the preceding batch, the general arrangements were the same, but, as previously stated, the loading was distributed over only half of the span. This system of testing is not only more severe than that in which the loading is, or at any rate supposed to be, uniformly distributed over both halves of the arch, but is far more in consonance with the actual conditions obtaining when the arch is carrying its proper share of the traffic, whether as a railway, road, or foot bridge; if the arch be uniformly loaded over both halves of the span the curve of moments is identical with the curve of equilibrium, and coincides with the axis of any cross-section of the arch. In order to insure accurately the validity of these assumptions it is necessary that the curve of the arch should be that of a parabola or the cross-section of a rib of the arch symmetrical. The first of these conditions is not absolutely essential when, if  $S$  be the span of the arch and  $R$  the rise, we have nearly the proportion—

$$R = \frac{S}{10}.$$

The next series of tests comprised seven examples of arches, all of 9 ft. span; of these, one was of plain rammed concrete, one built in simple Monier cement, another of Monier cement-concrete, one constructed of ordinary, and one of a special description of brick, and two of corrugated iron. It will effect a saving of both valuable time and labour and space if we give the results attending these experiments in a tabular form, adding thereto such remarks and observations as the nature of the case may fairly call for.

TABLE I.

No.	Description.	Depth at Crown.	Rise.	Breaking Weight.
1	Arch of rammed concrete	3'4	9'2	0'513
1	Arch of plain Monier concrete	2'0	12'0	0'593
1	Arch of Monier cement concrete	2'2	12'0	0'643
1	Arch of ordinary bricks	5'6	12'0	0'432
1	Arch of special bricks	4'0	5'4	0'231
1	Corrugated iron	—	12'0	0'476
1	Corrugated iron, hooped with angle-iron at ends.	—	12'0	0'538
7				

In the table the depth at the crown is given in inches and decimals, the rise in the same units, and the breaking weight in decimals of tons per square foot. It will be seen that similarly to what took place in the first series of experiments the arch constructed of special bricks failed badly; it also deflected at the crown to a very abnormal extent, and may therefore be considered quite out of the running. There is, it will be noticed, but little difference, not exceeding about 9 per cent., between the resistance of the arch built of Monier cement and that of those built of concrete, and the bending moments at the crown were also nearly identical; it would, however, be advisable to slightly increase the thickness at the crown of the arch of concrete. A lesson of some interest may be learned from the experiments made with the two arches of corrugated iron. The dimensions of the corrugated iron in both instances were the same—that is, 3½ in.

deep, ½ in. in thickness, and a pitch of 2 in.; but, in order to discover whether the addition of extraneous material to one of the arches would augment its powers of resistance, an angle-iron, 2 ft. 2 in. by 2 in. 2 in. by ½ in., was riveted longitudinally to each end or skewback length of one arch, while the other was not so liberally provided. The reason for so fortifying one of the corrugated-iron arches and not the other was also to demonstrate what effect upon the ultimate powers of resistance would a diminution of local distortions along the springings of the arch possess. A reference to Table I. will indicate that the arch furnished with the extra angle-irons exceeded in actual breaking strength the arch not so provided by about 15 per cent. It is very possible that this increase in the absolute strength before final rupture was reached was not so much

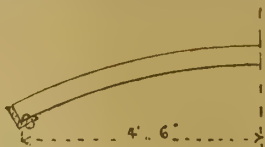


FIG. 1.

due to any real increase imparted to the corrugated iron arch as to the collateral condition obtaining, which was that the riveting-up of the extra angle-irons at each end prevented any crippling or buckling of the material just where it was weakest. In this instance, the corrugated iron was enabled to exert its full powers of resistance against any distortion or deformation, and also to avoid cracking and fissuring. All those who are conversant with testing experiments are well aware how essential it is that any sample or specimen should have fair play—that is, should be properly fixed, truly bedded, and the breaking-stress brought upon it in the exact direction which will enable it to exert its greatest strength. From the totally different molecular constitution of the materials it will be anticipated that the deflections at the crown of the corrugated-iron arches were greater than those of the arches of the same span built in concrete or in cement. It should be stated that while the amount of the ultimate breaking loads is in all cases a fair test of the ultimate resisting powers of the specimens tested of whatever material they may be composed, yet some of the arches developed fissures, and practically became *hors de combat* long before others did. The question might be very reasonably asked, if this is the case, why not gauge the strength and value in a working point of view of the specimens submitted to trial by the load which renders them unfit for their work—that is, completely unserviceable—instead of by the weight which actually breaks them to pieces? The answer to this interrogatory is that various specimens of different

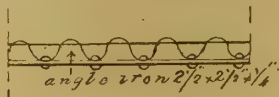


FIG. 2.

materials commence to show deformations, fissures, cracks, and other incipient signs of ultimate dissolution at such very different periods and of degrees so widely separate, one from the other, that the most experienced hand often fails in his attempt to draw the true line of demarcation. Two specimens subjected to test might at about the same period of the operation, and with the same amount of loading, develop cracks of the same magnitude, and yet, in the one instance, the apparent weakness or defect might be of a very serious character, and, in the other, of not the slightest importance whatever. It may be here observed that, in point of dead weight, the corrugated iron arches scored greatly over their rivals.

The manner in which the end strengthening angle-irons were riveted to the corrugations of the metallic arches is represented in Figs. 1 and 2, the former being a half-elevation of the arches showing the angle in section, and the latter a longitudinal section through the arch, in which the angle-iron is in elevation. These iron arches abutted against rolled beams, in the same manner as was shown in our last article for the arches in concrete.

We may now proceed to the consideration of

the compound system, as it has already been termed; but, before selecting one or more particular examples, it will be necessary to draw the attention of our readers to the general features which serve to distinguish this principle from those adopted in other designs. It may be at once stated that during the last four or five years the compound systems of arching have gained ground rapidly, although not, perhaps, exactly *pari passu*. Among the many coming under the category may be included the Melan, Metropolitan, Roetting, and Expanded Metal systems, all of which possess, firstly, some general common advantages and properties, and secondly, some features peculiar to each individual type. It should be kept in view as a broad rule, that it does not necessarily follow that because any one particular system proves itself under test to be superior in absolute strength to another that it would be the best to employ under all conditions and circumstances. A type offering a lower power of ultimate resistance might, in special instances, be more suitable, particularly when the necessity for the whole design being of a fireproof character arises, as is very frequently the case. The great defect of the earlier arched floor systems was their enormous dead weight, which, while adding very largely to the cost of any building in which they were used, contributed but in a very slight degree to the stiffening or strengthening of the edifice. It was probably the erection of the American "sky-scrapers" which imperatively demanded, and subsequently brought about, a light and yet stronger description of floor framing. When buildings rear their façades to a height of 18 to 22 stories, with a corresponding number of floors, a very slight increase of dead weight per square foot becomes a very serious consideration. One of the primary objections raised against the combination of iron or steel and concrete was that the unequal rates of the expansion and contraction of the two different materials under alternating thermometrical changes would render their union not only useless for all purposes of construction but dangerous to life and limb as well. Experiments, however—the only real and trustworthy arbitrators in such cases—demonstrated most conclusively that the two rates were so nearly identical, that for all practical purposes they might safely be assumed to be one and the same. As a matter of fact, it is not until the fifth decimal place is reached that any discrepancy in the respective values becomes apparent. When it is borne in mind what a very small fraction of the unit of expansion and contraction the coefficients represent, the difference between them may be regarded as a negligible quantity. In connection with our subject there is one rule universally applicable to all concrete arches, and that is, that they should not, although there is little doubt but that they frequently are, be subjected to stresses of a tensile character similarly to arches built of brick and stone; they are, or are supposed to be, constructed to withstand pressure—that is, stresses of compression only; but it is quite possible that in a concrete structure 10 per cent., and perhaps more, of the total amount of the compressive stresses may be converted into those of tension. In an iron or steel arch this contingency is of no importance, since it is adapted, and accordingly given a sufficient depth, to enable it to safely resist transverse stresses. One of the objects, therefore, in continuing the iron or steel in some form or another with the concrete, is to make it do the duty of carrying the tensile stresses while leaving the other material to do its work in resisting those for which it is suitable. In our next article we shall give further particulars and details, with drawings delineated to scale, of some of the combined systems in present use; it is, perhaps, to be regretted that very few of them have hitherto been experimented upon with dimensions of even approximate magnitude. There is an immense jump between testing an arch of some 10 ft. or 12 ft. span and one of 40 ft. or thereabouts. A system that answered with complete satisfaction to all the requirements of a span of the former dimension might completely fail when adopted for a length between bearings equal to the latter. When an arch of concrete belonging to one of the combined designs has comparatively a small rise, it has been stated that an economy of fully 50 per cent. of material has been effected over a similar structure of stone. We take leave to doubt this statement, and also another which claims that in flat arches the horizontal thrust at the abutments becomes reduced to zero.



## GRAPHIC STATICS.—IX.

IN Chapter VIII., No. 2199, we showed how to find either the resultant or the equilibrant of any number of parallel forces. We now come to consider some other matters relating to a system of parallel forces, and it will be convenient for us first to examine somewhat more particularly into the question of the action of two parallel forces on a rigid body.

*Like and Unlike Forces.*—*Algebraical Sum.*—Parallel forces are said to be *like* when they act towards the same parts, and *unlike* when they act towards opposite parts. In other words, *like* forces have the same *sense*, and *unlike* forces have opposite *senses*. It is common in this and in many other things to distinguish between the opposite directions of action or of measurement by calling one direction *positive*, and the other direction *negative*. Thus, if a force acting in one direction be denoted by  $P$  (or  $+P$ , since the sign  $+$  is always understood when no sign is prefixed), then an equal force acting in the opposite direction is denoted by  $-P$ . When things are combined, having due regard to the signs with which they are effected, we are said to obtain their *algebraical sum*.

From what has already been shown respecting parallel forces, it is clear that the resultant of any number of *like* parallel forces acts in the same direction as the forces, and is equal to the sum of those forces; also that, when the forces are not all alike, we may take the sum of all the forces which act in one direction from the sum of all those which act in the opposite direction, and the difference will give the magnitude of the resultant, which will act in the direction of the forces which make up the greater of the two sums. It is very convenient to be able to include two such statements in one, thus: The resultant of any number of parallel forces is equal to the algebraical sum of the component forces. In some investigations it is impossible at the outset to tell whether our result will be positive or negative; but this uncertainty need not trouble us if in all our operations we have due regard to sign as well as to magnitude.

Let the two parallel forces  $P$  and  $Q$ , Fig. 29 (a), act at the points  $L$ ,  $M$  respectively of a rigid bar. Draw  $ab$ , Fig. 29 (b), equal and parallel to  $P$ , and  $bc$  equal and parallel to  $Q$ , so obtaining the straight line  $abc$ , which is the unclosed polygon of the forces  $P$ ,  $Q$ ; draw  $bo$  parallel to  $LM$ , and in  $bo$  take any point  $o$ ; join  $oa$ ,  $oc$ ; draw  $LK$  parallel to  $ao$ , and  $MK$  parallel to  $oc$ , meeting in  $K$ , and forming with  $LM$  the funicular polygon  $LMK$  of the forces with respect to the pole  $o$ . Then, as was shown in connection with Fig. 28, the resultant of  $P$  and  $Q$  is a force equal and parallel to  $ac$ , and acts through  $K$ . Draw  $NK$  parallel to  $ac$  to meet  $LM$  at  $N$ ; then the resultant  $ac$  may be supposed to act at the point  $N$  of the bar.

From the similar triangles  $LNK$ ,  $oba$ , we have  $LN : NK :: bo : ab$ ; therefore,  $LN \cdot ab = NK \cdot bo$ . From triangles  $MNK$ ,  $obc$ , we have  $NM : NK :: bo : bc$ ; therefore,  $NM \cdot bc = NK \cdot bo$ . Hence  $LN \cdot ab = NM \cdot bc$ ; therefore,  $LN : NM :: bc : ab$ . That is,  $LN : NM :: Q : P$ , which, put into words, means that  $LM$  is divided at  $N$  in the *inverse ratio* of the forces  $P$  and  $Q$ . The above applies to Fig. 30 as well as to Fig. 29, and should be read again with reference to Fig. 30.

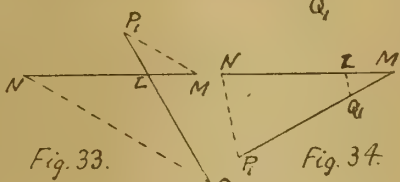
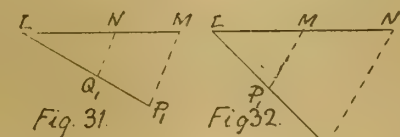
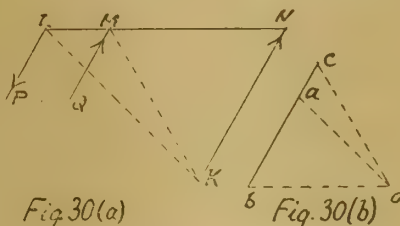
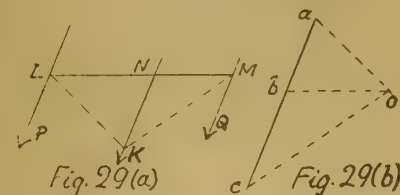
When the forces are *like*, as in Fig. 29, the resultant comes between the components, and  $LM$  is divided *internally* at  $N$  in the *inverse ratio* of the forces; when the forces are *unlike*, as in Fig. 30, the greater component comes between the smaller and the resultant, and  $LM$  is divided *externally* at  $N$  in the *inverse ratio* of the forces.

It should be noticed that the above reasoning and constructions apply when the two parallel forces  $P$  and  $Q$  act at the points  $L$  and  $M$  of any rigid body. All that is necessary is that the points of application of the forces shall be rigidly connected. And here it may be well to say that bodies and structures which do not appreciably alter their form while under the action of a given system of forces are considered for the time being as rigid bodies, although, strictly speaking, there is no such thing as a "rigid body" in existence. To avoid the necessity for too great prolixity, it is often needful for the student to make similar allowances in his reading.

If a number of parallel forces act at given points of a rigid body, we may call the point at which the resultant may be supposed to act the *centre* of the parallel forces; the reason for this will shortly appear.

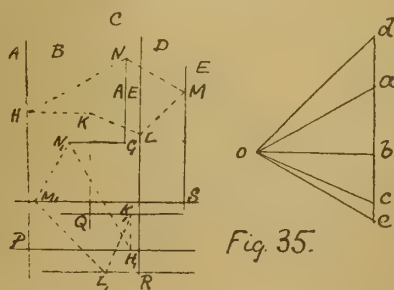
It is a known geometrical fact that parallel lines cut all lines which meet them proportionally. This suggests the following simple construction for the *centre* of two parallel forces,  $P$  and  $Q$ , which act at the points  $L$  and  $M$  respectively,  $Q$  being the greater force.

From  $L$ , Figs. 31 and 32, the point of application of  $P$ , draw, in any convenient direction, a line,  $LQ_1$ , to represent to any scale the magnitude of the other force  $Q$ . Make  $Q_1P_1$  represent the force  $P$ , to the same scale and along the same line;



then  $Q_1N$ , drawn parallel to  $P_1M$ , cuts  $LM$  in the required point  $N$ , which is the *centre* of the given forces. Observe that when  $P$  and  $Q$  are *like* forces, as in Fig. 31,  $LQ_1$  and  $Q_1P_1$  are measured in any the same direction; but that they are measured in opposite directions when the forces are *unlike*. Following out this construction does not always give a figure of the same form, unless we always work from the point at which the lesser force acts. In Fig. 33 is shown how the above construction works out, when  $P$  and  $Q$  are *unlike*, and  $P$  is the greater of the two forces instead of being the less, as was supposed above. Of course, in such a case we could work from the point  $M$  instead of from  $L$ , and so obtain a figure of the more familiar form shown in Fig. 34, where  $MP_1$  is equal to  $P$ , and  $P_1Q_1$  is equal to  $Q$ , &c.

If the forces acting at  $L$  and  $M$  be equal and



*unlike*, it is easily seen that the constructions above given for finding the *centre* will fail, and that, in fact, such a system of parallel forces has neither *centre* nor resultant. It will be necessary to refer to this matter again in a subsequent chapter.

To find the *centre* and resultant of *three* given forces, whose points of application also are given, the forces being all parallel, but not necessarily all in the same plane, first find the *centre* and

resultant of any two of the given forces. Then find the *centre* and resultant of this partial resultant and the third force. These will be the *centre* and resultant of the three given forces.

We see then, that the position of the point at which the resultant may be supposed to act does not depend on the direction in which the component parallel forces act, but only on their relative magnitudes, and their points of application. If these components be turned about their points of application in any manner, still remaining parallel, the point at which their resultant acts will still be the same; and it is for this reason that this point is called the *centre* of the parallel forces.

*Centre of Parallel Forces.*—It is easy to see that this principle applies to any number of forces, and hence we have the following definition:—The *centre* of a system of parallel forces is the point at which the resultant of the system may be supposed to act, whatever may be the direction of the parallel forces, so long as they retain their original points of application.

The construction given above for the *centre* of parallel forces becomes long and tedious when there are many forces; in such a case the funicular polygon offers a much better means of obtaining the same result.

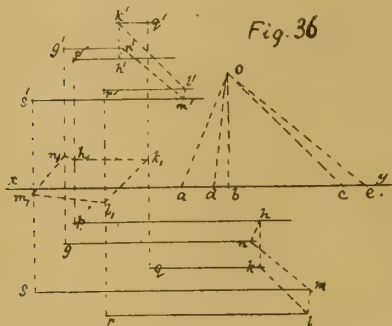
To find the *centre* of any given system of parallel forces, whose points of application lie all in one plane:—Let  $P$ ,  $Q$ ,  $R$ ,  $S$ , Fig. 35, in the plane of the paper, be the points of application of the given parallel forces. If the forces be not in the same plane with  $P$ ,  $Q$ ,  $R$ ,  $S$ , they may be turned about these points into that plane, still retaining their parallelism and the same *centre*. Draw then, Fig. 35, the lines  $A B$ ,  $B C$ ,  $C D$ ,  $D E$  in any direction parallel to each other to represent the lines of action of the given forces; and set off  $ab$ ,  $bc$ ,  $cd$ ,  $de$  equal respectively to the forces along a line parallel to these, so obtaining the force polygon  $abcde$  for the assumed direction. Draw the funicular polygon  $H K L M N$  with respect to the pole  $o$ . Then, for this position of the forces, the resultant will act through  $N$ , and, therefore, the *centre* of the parallel forces must be somewhere in the line  $NG$  drawn parallel to the assumed direction of the forces. Suppose, now, that the forces are turned, still in the plane of the paper, so as to act in any other direction, and to remain parallel; then a new force polygon  $a_1b_1c_1d_1e_1$  and a new funicular polygon  $N_1H_1K_1L_1M_1N_1$  being drawn with respect to any pole  $o_1$  for this new position of the forces, we find  $N_1G_1$  for the line of action of the resultant of the forces in this changed direction;  $G_1$ , the point of intersection of these two positions of the resultant, gives the position of the required *centre* of the parallel forces. In this second operation there is no actual need to draw the force polygon, since we know that if the poles  $o, o_1$  be similarly placed with respect to the two force polygons, then the vectors will all have been turned through the same angle that the forces have, and therefore the sides of the new funicular polygon will make that same angle with the sides of the first respectively. It is convenient to turn the forces through a right angle, as in the figure; then the sides of the new funicular polygon must be drawn perpendicular to the corresponding ones of the first. It is important to notice that this reasoning and construction will apply to any system of parallel forces, provided only that the points of application of the forces be all in one plane.

If the points of application of the parallel forces be not all in one plane, we may project these points on any plane, and, taking the projections as the points of application of the corresponding forces, we may find the *centre*; this will be the *projection* of the required *centre*. This evidently holds for two parallel forces, because the ratio of the distances of the centre from the points of application of the forces is the same as the ratio of the projections of these distances. Therefore it holds for the resultant of these two forces and any third parallel force; therefore it holds for the resultant of three parallel forces and any fourth parallel force; therefore it holds for four parallel forces; and so on for any number of forces. Hence, if the projections of the centre be thus obtained on two planes, preferably at right angles to each other, the position of the centre will be completely determined.

As an example, let  $xy$  be the ground line, Fig. 36, and suppose  $p, p'; q, q'; r, r'; s, s'$  to be the orthographic projections of the points of application of four parallel forces, which may act



in any given direction. Taking the plans  $p, q, r, s$  of the points of application, and supposing the forces to act at these plans, and in directions parallel to the ground line, we may set off in succession along the ground line  $ab, bc, cd, de$ , equal respectively to the forces, so getting the force polygon  $abcde$ . Taking  $o$  as pole, and drawing  $hn$  parallel to  $oa$ ,  $hk$  parallel to  $oh$ ,  $kl$  parallel to  $oc$ ,  $lm$  parallel to  $od$ , and  $mn$  parallel to  $oe$ , we have the funicular polygon  $n h k l m n$ , and  $ng$  parallel to  $xy$  as a line containing the centre when the forces act at  $p, q, r, s$  respectively. Hence  $ng$  contains the plan of the required



centre. Suppose now that the forces and the force polygon are turned through a right angle, and draw a new funicular polygon  $n_1 h_1 k_1 l_1 m_1 n_1$ , the sides of which are respectively perpendicular to the sides of the first; then  $ng$ , parallel to the new direction of the forces—that is, perpendicular to  $xy$ —gives a second line, which must contain the plan of the required centre. Hence  $g$ , the point which these lines intersect, is the plan of the required centre of the given forces.

Now, suppose the forces to act at  $p', q', r', s'$ , the elevations of their points of application, and again let their directions be parallel to  $xy$ ; then the same force polygon may be used, and the funicular polygon  $n' h' k' l' m' n'$  drawn, and so the line  $n'g'$  obtained, which will contain the elevation of the required centre. The elevation,  $g'$ , is found by projecting from the plan  $g$  to meet the line  $n'g'$ , and thus the position of the required centre is fully determined. It must not be supposed that the two funicular polygons,  $n h k l m n$  and  $n' h' k' l' m' n'$ , are necessarily related to each other as plan and elevation respectively of any the same polygon having its angles on the actual lines of action of the forces. The same lettering has been used for all the funicular polygons merely to make the construction a little easier to follow.

J. C. PALMER.

### STABLE CONSTRUCTION AND SANITATION.—IX.\*

**A**MONGST other varieties of bricks for stable paving may be mentioned a type of brick having a series of projections arranged on face in order to afford the necessary foothold, whilst permitting the surface to be adequately drained.

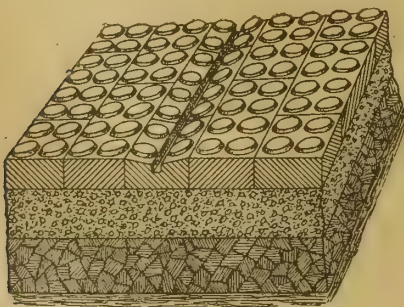


Fig. 73.

Fig. 73 is a sketch of a pavement of this description, known as "Tebbutt's Patent Safety Paving," each brick being formed with a series of circular flattened projections standing about  $\frac{3}{4}$  in. above the general surface, thus providing an equally secure grip to the hoof in whatever direction the horse is standing or walking. The projections are placed sufficiently close together

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that the tops of the knobs form the treading surface, and being equally drained, it is seen that for practical purposes a perfectly dry walking or standing surface is obtained. Another design, known as "Fiander's Registered Pattern Paving," is shown in Fig. 74. Each brick is

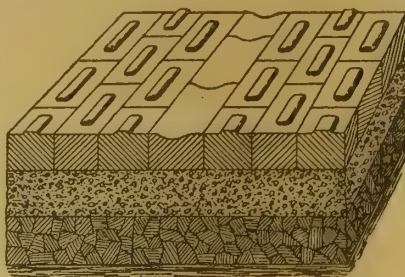


Fig. 74.

formed with a raised "frog" or rectangular projection, so as to provide a non-slipping surface. The projections are spaced comparatively far apart, in order that the horses' feet may enter between them, whilst at the same time the raised portion affords the necessary grip to the hoof.

For decorative purposes the paving of the passages at the rear of the stalls is sometimes laid with bricks having a more or less ornamental pattern stamped upon them, or the ordinary plain or chamfered stable bricks may be arranged according to some geometrical design. Figs. 75 and 76 are typical illustrations of paving-bricks arranged with an ornamental pattern on the face. Sketches of plain paviers laid "herring-bone" pattern and in "small squares" are shown in

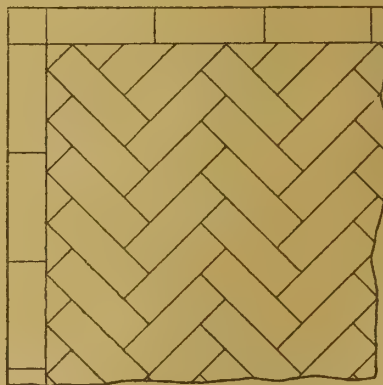


Fig. 77.

Figs. 77 and 78 respectively, whilst Figs. 79 and 80 show the ordinary chamfered bricks disposed in other simple regular forms.

The dimensions, weight, and covering capacity of the different descriptions of paving-bricks mentioned are as follows, viz. :—

Description.	Size.	Approximate Weight.	Average No. per super. yd.
	Inches.	Lb.	
Cork paving bricks .....	9 x 4 1/2 x 1 1/2	1 1/2	32
" " " .....	9 x 4 1/2 x 1 1/2	2 1/4	32
" " " .....	9 x 4 1/2 x 2	3 1/4	32
Wood-block paving .....	9 x 3 x 4 1/2	2 1/4	48
" " " .....	9 x 3 x 6	3 1/4	48
Picked stocks, laid flat.	8 1/2 x 4 1/2 x 2 1/2	7	35
on edge.	8 1/2 x 2 1/2 x 4 1/2	7	54
Dutch clinkers .....	6 1/2 x 1 1/2 x 3	1 1/2	140
Adamantine clinkers ..	6 x 1 1/2 x 2 1/2	2	120
Terro-metallic clinkers	6 x 1 1/2 x 2 1/2	2	120
Staffordshire blue paviers .....	9 x 4 1/2 x 2	6	32
" " " .....	9 x 4 1/2 x 3	9	32
Single-groove paving bricks .....	8 x 2 1/2 x 2 1/2	4	60
Candy's "Olympia" paving bricks .....	9 x 4 1/2 x 2 1/2	7	32
"Tebbutt's safety paving bricks .....	10 x 5 x 2 1/2	8 1/2	26
"Fiander's" registered paving bricks .....	9 x 1 1/2 x 2 1/2	8 1/2	32
" " " .....	9 x 1 1/2 x 3	9	32

Portland cement concrete, when properly executed, forms an excellent material for stable-paving. It is non-absorbent, watertight, smooth, jointless, not affected by heat or cold, easily cleaned, and comparatively inexpensive. At the same time, it is necessary to remember that Port-

land cement concrete as ordinarily made and laid is quite unsuited for the purpose. To form a stable floor of cement concrete which shall prove satisfactory under constant and heavy wear, it is necessary that the whole shall be composed of the very best materials, whilst considerable care and

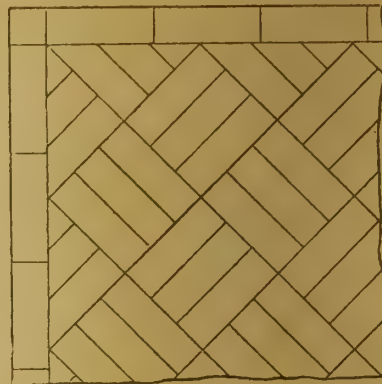


Fig. 78.

experience are required to properly mix and lay the same. There are many well-known firms of concrete-workers who make a speciality of stable-paving, and where concrete floors are intended to be adopted for stables, it is desirable that the work should be carried out by a competent and experienced firm. By this means good and durable work will be insured.

Concrete for stable paving is—or should be—

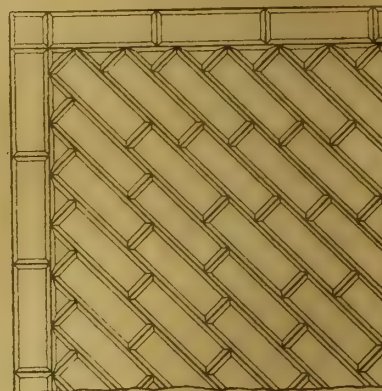


Fig. 79.

composed of well-washed granite chippings and Portland cement of the best quality, the whole being so intimately mixed together that, when thoroughly set, the finished material is as hard as granite itself. During the process of laying the concrete the surface must be floated and trowelled to proper falls. In addition, the surface should be formed with a series of grooves,

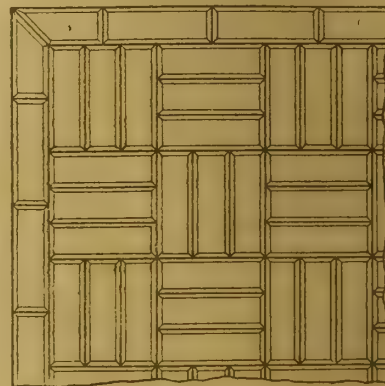


Fig. 80.

so as to afford a good foothold for the horses, and to assist in the more complete and ready removal of urine or waste liquids from the floor of the stable.

For coach-houses, cow-houses, and similar purposes the concrete paving need not be more



than 2in. thick; stable-floors for carriage horses, &c., should be 2½in. thick; but where heavy wear-and-tear is anticipated, as in tramway stables and for heavy draught-horses generally, the paving should be not less than 3in. in thickness. The passages and gangways at the rear of

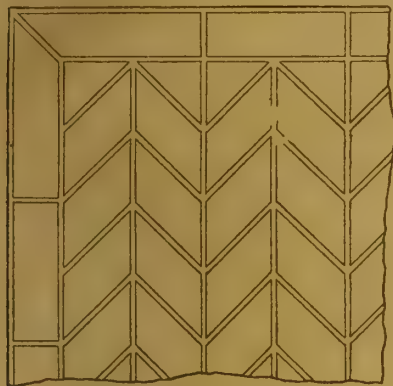


Fig. 81.

the stalls are frequently grooved to some ornamental pattern, so as to improve the appearance of the stable. Figs. 81 to 84 are representative of the mode of grooving adopted for this purpose. If desired, the concrete may also be coloured red, buff, green, &c.; but the use of coloured concrete is in most cases confined to the floors of the passages, the stalls and loose boxes being finished in the natural grey colour of the material.

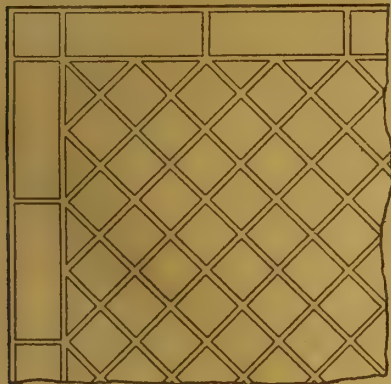


Fig. 82.

All stable paving should be laid on a firm unyielding substructure. For ordinary purposes, a foundation of 6in. of Portland cement concrete, in the proportion of 6 parts aggregate to 1 of cement, laid on a layer of hard, dry, broken brick rubbish, 6in. thick, and well rammed, will afford a good base to receive the paving. Fig. 37 shows 3in. of concrete foundation

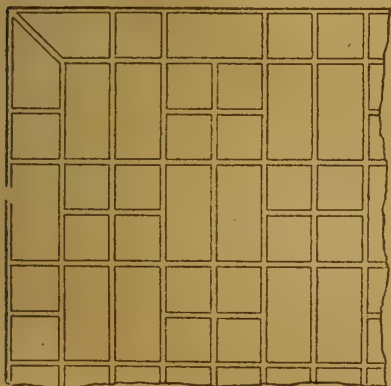


Fig. 83.

with a 6in. layer of broken brick rubbish under; whilst Figs. 85 and 86 are sections through plain and chamfered brick stable paving respectively laid on a similar foundation.

The general conditions which should be fulfilled by a satisfactory pavement for cow-houses are

essentially the same as those already mentioned for stables (except that the floor will not be subject to the heavy wear and tear of iron-shod hoofs), and the same remarks respecting the suitability of the different materials for paving purposes will apply in this case. Usually it will be found

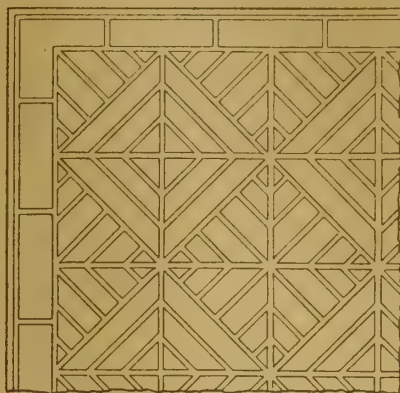


Fig. 84.

that the most satisfactory material for the floors of cowhouses is Portland cement when properly laid.

Stable-yards, coach-houses, &c., are also paved with the same description of materials as those already described, and currented to surface-channels or gullies. Where plain or grooved bricks are used, they are frequently laid to ornamental patterns, similar to those shown in Figs. 77 to 80.

The floors of rooms or stores built over stables

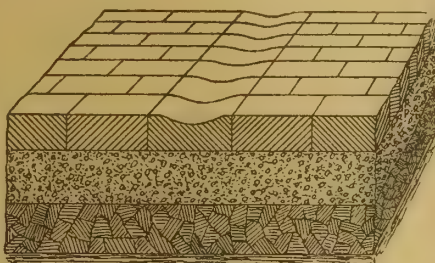


Fig. 85.

should be so constructed as to prevent any emanations penetrating from below, and so vitiating the air of the upper story. If the rooms are used for living or sleeping apartments it need scarcely be added that this precaution is necessary for health. Where they are used as stores for fodder, it is equally desirable that the food should not be tainted with effete organic matters arising from the occupied stable beneath. In some cases the overhead hay-loft is entered from the stable through an opening in the floor, whilst other openings are also provided over the mangers so that the hay may be thrown directly into them. Such a method minimises the labour of feeding;

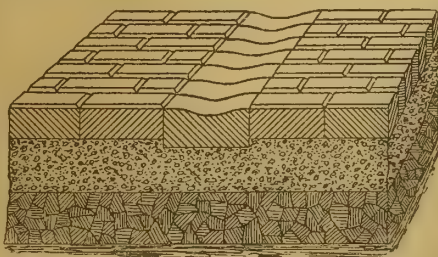


Fig. 86.

but the sweet and wholesome flavour of the fodder is in some degree sacrificed and spoilt by contamination with the impure air from below.

For an ordinary wood floor the flooring boards should be grooved and tongued, and laid with close joints. The underside of the joists should be finished with a lath and plaster ceiling. In order that the horses may not be disturbed by the noises overhead, it is a good plan to provide "sound-boarding." This consists of 1in. rough

deal boards laid between each joist and nailed to 2in. by ½in. rough fillets, the whole supporting a 3in. layer of "pugging," made with lime-water and chopped hay mixed together.

A very satisfactory floor is obtained with Portland cement concrete supported on rolled-iron joists, or one of the numerous forms of fireproof floor which have been introduced from time to time may be adopted. The soffit of the floor is plastered or rendered smooth with cement. Where the rooms above are intended for living or sleeping purposes, they may be finished with boarding or wood blocks. For stores, the surface is usually rendered with cement, but it may be finished with tiles or asphalt.

#### THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE nineteenth annual dinner of this deserving charity was held in the King's Hall of the Holborn Restaurant on Tuesday evening, under the chairmanship of the president, Mr. Thomas Hall, of the firm of Messrs. Hall, Beddall, and Co., and passed off very successfully. Among those present were Messrs. T. E. Colcutt, F.R.I.B.A., Henry Lovegrove, F.R.I.B.A., Ellis Marsland (Hon. Sec. S.A.), Wm. Woodward, A.R.I.B.A., Alexander Ritchie, J.P., C.C. (McDowall, Steven, and Co.), Joseph Randall (Kirk and Randall, Woolwich), W. R. Freeman, T. F. Rider, J. H. Colls, B. E. Nightingale, R. Downs, F. H. Reed, W. J. Farthing, S. Clarke, J. Clayton, T. Stirling, H. T. Stirling, C. Bussells, G. de Quincey, Major E. C. Roe, and the secretary (Mr. H. J. Wheatley).

Following the loyal and patriotic toasts, the president, in proposing success and continued prosperity to the Builders' Clerks' Benevolent Institution, explained that it was founded in 1866, and had already elected 43 pensioners, 20 of whom were still upon the books. Further, a great deal of good had been done in granting temporary relief in necessitous cases. The total amount paid in this respect amounted to £6,800. In no case, however, had the committee granted more than £10 to any one man in one year. The total expenditure last year on account of the relief fund was £467, and the income arising from annual subscriptions and dividends was only £248, the balance of £219 having been met by the donations received at their last dinner. Their reserve fund was £5,400, and the committee were most anxious not to reduce that, as they did not consider it any too large. Those present would see, therefore, how largely the institution depended upon the donations received at the annual dinner. Knowing that, he hoped the company would contribute as generously as they were able. Speaking to builders' clerks in particular, he eulogised the institution as a means of providing against bad times, and making provision for their widows and orphan children. Mr. W. R. Freeman next submitted "The Architects and Surveyors," speaking of the close connection between those professions and their own trade, and of the regard they had one for another. Mr. William Woodward acknowledged the toast on behalf of the architects, and Mr. H. Lovegrove for the surveyors. The other toasts were "The Builders," proposed by Mr. Alexander Ritchie, and responded to by Mr. J. Howard Colls; "The Merchants," submitted by Mr. Ellis Marsland, Mr. John Fraser returning thanks; and "The President," proposed by Mr. Tom F. Rider, an ex-president, and duly acknowledged from the chair; "The Past Presidents," given by Mr. Edwin Brooks, and responded to by Mr. B. E. Nightingale; and "The Visitors," proposed by Mr. F. S. Oldham, and acknowledged by Mr. W. T. Plume. During the evening the secretary read a long list of subscriptions and donations, the total, as announced by the President, amounting to over £380, or over £50 more than at any period during the past five years.

Sir Henry Irving has fixed noon on Monday, June 14, for the ceremony of unveiling the new statue of Mrs. Siddons, on Paddington-green.

Sunday opening was resumed this week at the two National Galleries, and at the seven National Institutions open in the Metropolis. The attendance during the afternoon was as follows:—South Kensington Museum, 2,690; Natural History Museum, 1,345; British Museum, 1,061; National Gallery, 1,551; National Portrait Gallery, 893; Bethnal Green Museum, 1,264; Geological Museum, 228; total, 9,022.



## COMPLIMENTARY DINNER TO MESSRS. MONTGOMERY AND CALLENDER.

At the close of the recent highly successful Building Trades Exhibition, held at the Agricultural Hall, it was felt by many exhibitors that it would be fitting and pleasant to testify in some way the high appreciation in which the services of the energetic and business-like gentlemen who were primarily the promoters of the display, Messrs. H. Greville Montgomery and G. M. Callender, were held. A meeting of exhibitors was accordingly convened on the 27th March, at which it was decided to give a complimentary dinner to these gentlemen, to be held at the Midland Grand Hotel, St. Pancras, on Wednesday evening, and a committee of five was appointed to make the arrangements—viz., Mr. C. J. Bailey (Messrs. G. Skey and Co., Limited), Mr. H. J. Harding (Messrs. W. H. Martin and Co.), Mr. G. Marlow Reed (Messrs. John Knowles and Co.), Mr. W. Ward (Granite Plaster Co.), and Mr. W. A. Cameron Waller (Waller's Grip-Fast Tile Co.).

About fifty gentlemen connected with the building trades sat down to an excellent dinner in the Venetian Room at the Grand Midland Hotel on Wednesday evening. Mr. W. Ward occupied the chair, being supported on his right and left by the guests of the evening. Among those present were Messrs. John P. Seddon, F.R.I.B.A., Harold Rathbone, of the Della Robbia Pottery (Birkenhead); C. J. Bailey, Broad, E. T. Chapman (Croydon), G. Davenport, Mark Gentry (Hedingham), H. J. Harding, H. Heinemann, E. Holwill, W. H. Martin, P. A. Randall, G. Marlow Reed, Lawrence Seager (Sittingbourne), H. B. Tarry, Thomas and Taylor (Paddington), G. Tucker (Loughborough, Leicestershire), H. Turner, W. A. Cameron Waller, &c. The after-dinner proceedings were informal in character, the speeches being commendably brief and to the point, and interspersed with sentimental and humorous songs. The remarks drifted, it will be seen, into a discussion on the practicability and desirability of seeking to establish a Builders' Exchange for London, the general tenor of opinion seeming to be in favour of the suggestion being carried into effect.

The usual loyal sentiment having been honoured, the CHAIRMAN, plunging in *medias res*, gave the toast of the evening. He remarked that he had the pleasure of seeing around the table a large body of gentlemen connected with the most important and numerous industry in the kingdom, and he thought that their honoured guests, Messrs. Greville Montgomery and Callender, ought to feel very proud that such a numerous and representative gathering had come together of those who had taken part in the recent Building Trades Exhibition. This banquet was a gratifying testimonial to the success of that exhibition. Personally, he should have wished to have seen still more of the exhibitors present; but at the same time they must bear in mind that they were scattered far and wide all over the kingdom. He had sent out over 240 invitations for that evening, and had received responses from nearly everybody, and the majority of those who were not able to be present had wished him to convey to their guests their high appreciation of the excellent way in which they had conducted the exhibition. (Applause.) A number of gentlemen who were not present had asked to be allowed to contribute towards the musical, printing, and other expenses of the evening. As an exhibitor himself, he went into the display at the Agricultural Hall in a business-like manner, and if all present had reaped the same success as he had enjoyed, they would drink to the continued health and success of Messrs. Montgomery and Callender with the utmost heartiness. (Applause.) Those gentlemen entered, like themselves, into this undertaking as a commercial venture, not primarily for the benefit of the exhibition; but, as business men, first of all, they went into the venture to make money at it, and everyone present was glad to know that in that they had been successful, for they had deserved success. It was one thing, as they all recognised, to render an exhibition financially profitable as a show, and quite another matter to make it a success from the exhibitors' point of view, and as this touched the interests of all, they ought to appreciate the excellent and most satisfactory manner in which it had been accomplished. There had been a marked absence of the side shows and outside exhibits which had so greatly impaired the unity and business-like character of

previous exhibitions, and he would ask them to drink very heartily to the good health and continued prosperity of their guests.

Mr. BROAD, in supporting the toast, said he had had considerable experience of exhibitions, but he had never seen one conducted with so much "class" as the one that had just closed. Everyone would recognise that Messrs. Montgomery and Callender had elevated the exhibition into something more than a mere money-making display, and they had indeed done their level best to make it thoroughly satisfactory to all connected with the building trades. Such a venture had involved an enormous amount of labour, and must have been attended with some disappointments and anxieties; but, judging by its results, they could not say too much of the way in which it had been conducted. He could not sit down without referring to the action of these gentlemen in organising the clay-working industry. This movement was started on a modest scale a very few years ago, and had been the means of welding together the entire trade, while the Journal was of great service to the members. On one point he feared that he differed from his friend Mr. Montgomery, and that was on the frequency with which such exhibitions should be repeated. Because it was so great a success, it ought not, he strongly felt, to be held too often. That was one of the causes which led to the failure of previous enterprises of the kind.

The toast having been drunk with enthusiasm and musical honours, Mr. MONTGOMERY responded. He said he felt somewhat in the position of a Member of Parliament who had been returned as Member for the Agricultural Hall for about a week, and was asked to come down and address his constituents. He could only say he was obliged to them for electing him; that he should continue to endeavour to retain their confidence, and wished to keep his seat as long as possible. He was, as they all recognised, a Radical in the matter of running exhibitions, and was ever on the look-out for means of securing further improvements. There was no such thing as finality in exhibitions; but he was Conservative enough to wish to retain all his constituents. It had been a great pleasure to Mr. Callender and himself to see that their efforts had been so successful. They had not heard a single complaint from any exhibitor that they had not kept their promises, nor had any said that they were disgusted with the arrangements; and many who had come to scoff had remained to pray. There had been a certain number of objections raised; but these came not from the exhibitors, but from a section of the Press who had ever treated them most unfairly, and had damned them with faint praise. They had been told that the policy of holding the exhibitions in alternate years was wrong, and that they ought only to take place every five years. That would be absurd, for if the present management decided not to engage the Agricultural Hall for five years, they might depend upon it a syndicate of Jews would spring up who would run a show simply for the gate-money, and would speedily land themselves in the bankruptcy court, as two previous managers had done, thus setting up a retrograde movement. The same critics told them that they ought only to show novelties; but if the exhibition were opened only once in five years, it was clear that many things which were new inventions in the earlier years after the show closed would cease to be such before the doors were again opened. They rather courted criticism, but objected to the penny-a-line comments of irresponsible reporters. The fact was, the exhibition had to be run on business principles, and when this was done, architects, surveyors, and others went there to see what was going on. So long as architects, builders, builders' merchants, and others specially interested visited the exhibition and took notes of what was there to be seen, he was well satisfied, and, as he had already said, there had not been a single complaint this year from an exhibitor. It had been said that the exhibition was not sufficiently advertised. He had his own ideas about that point; but he would tell them what they had done. They distributed and caused to be exhibited some 3,000 large bills in stations, and issued over 6,000 invitations to architects, municipal engineers and surveyors, builders' merchants, and builders. After the success of the exhibition was certain, he might say that they expended over £200 more in making assurance doubly sure. They could easily have packed the hall with the general public, but not one-tenth

of the amount of business would then have been done. He would conclude by saying he was extremely obliged to those present for the way in which his efforts had been appreciated, and would be stimulated thereby to render the exhibition of 1899 a still greater success.

Mr. CALLENDER also briefly responded, observing that it was a very great pleasure to meet again, under such happy circumstances, so many of the people with whom they had associated at the Agricultural Hall; to feel that those whom they had to meet in business relations had become old friends who appreciated their efforts to render the exhibition a mutual success. As Mr. Montgomery had indicated, they had done a great deal of work which did not show prominently—preliminary labour which extended over not weeks merely, but many months. The credit of organising and carrying it through was due to Mr. Montgomery; as for himself, he was merely the "calendar" for the year, and he trusted that they would exhibit as satisfactory a "calendar" for 1898 or 1899, and that whenever they reopened a building trades display, the exhibitors would be animated by the same kindly feelings that they had evinced that evening.

Mr. G. MARLOW REED, in a humorous address proposed "Prosperity to the Building Trades of England," and coupled with it the name of Mr. W. A. Cameron Waller, remarking that, while his firm had to do with the drain-pipes, his friend dealt with the roofs of buildings. He urged that masters of the building trades should bear in mind that when they harmed one another they injured themselves; it was better for everyone that they should work harmoniously together, and not to go for each other's livers, and such a gathering as that tended to promote this good feeling and mutual sympathy.

Mr. CAMERON WALLER, in response, said the recent successful Building Trades Exhibition had been the means of bringing together those who were competitors. He wished to make a suggestion that had long been on his mind, and that was that the time had come for the formation of a Builders' Exchange for London. As many of them were aware, there was a flourishing Builders' Exchange in Glasgow, and the same idea had just been taken up in Edinburgh. London might justly claim to be the most important city in the kingdom, and surely if these could be made successful undertakings in the Northern cities, there was room for such a movement in London. Not only so, but the timber and iron trades already had their Metropolitan exchanges, and it seemed a strange thing that there was nothing of the kind in London for the representatives of bricks and mortar. He should like to hear the opinions of others on the subject, and would promise that if the idea were adopted he would render all the support in his power.

In reply to a call from the chairman, Mr. MONTGOMERY said the suggestion of a Builders' Exchange for London was by no means a novel idea to him, for the formation of such a body had been proposed a good many times of late years; but so far the scheme had not taken any tangible form. The Institute of Clayworkers, to which Mr. Broad had alluded in such appreciative terms, had thus far proved a great success: in its offices they had provided a museum, where architects could freely inspect the various products of different districts, and could inform themselves where a particular kind of brick could be obtained. He might add that he had privately mooted the question, and several architects, and the majority of those connected with the building Press, were favourable to the idea. If such a Builders' Exchange were established in the Metropolis, it would have to be done on a very large scale, or it would not be worth while to undertake it. The promoters of such an Exchange would have to face the problem of the provision of a building sufficiently central, and of the size and importance which such an undertaking would merit; but should such a scheme be organised, he would do his utmost to support it and make it a success.

The CHAIRMAN said similar Builders' Exchanges had been established in New York, Pittsburgh, and Chicago, and if Glasgow and Edinburgh could support such institutions, he could not see why it should not successfully be carried out in London. It meant, of course, buying a considerable property, not only for offices and conference rooms, but an enormous amount of space would be required for exhibits. The idea was, however, a good one, and should it commend itself to the trades, he knew of no one better able



to carry it to a successful issue than Messrs. Montgomery and Callender.

Mr. MARK GENTRY suggested that the co-operation and financial support of some of the City Companies should be sought in carrying out the scheme.

Mr. BROAD said the question had occupied his attention for years. He thought it was most desirable that the various trades connected with building should be brought together in one institution to work in co-operation, for although they were competitors, their interests were identical. As had been hinted, if carried out, such an Exchange must be a very big affair. It would only answer if it were taken by one particular man who was personally independent of all the trades, and such a man was to be found in Mr. Montgomery. It needed to be backed up and energetically pushed forward by some one who was head and shoulders above any suspicion, and who would not arouse the jealousy of any one trade. They had founded of later years associations of clayworkers, lime-merchants, and brickmakers, besides plasterers and other trades, and why could not all be amalgamated and fused into one body representing the largest industry in Great Britain? If Messrs. Montgomery and Callender would take the matter in hand, he was convinced that this would be done, and the Exchange would become an accomplished fact—one that would be of great use and benefit to all. He would support the scheme to the full extent of his powers.

Mr. JOHN P. SEDDON said if the exchange was to succeed, there must be no selfishness or jealousy manifested. From the architect's standpoint, he thought it would be a very useful undertaking.

Mr. HAROLD RATHBONE thought the proposals as sketched out were on too large a scale and would impose too heavy a responsibility, financial and otherwise, on the initiators. The idea was excellent; but he would urge that they inaugurate the movement in a modest and elemental character, and further, that from the very first, the aim should be to render it self-supporting. If possible, branch offices should be formed in various districts.

Mr. CALLENDER said he was told at Glasgow that a local builders' exchange was very well in its way; but it ought to be centred in London. If it was left to provincial cities to organise such a movement, no good would be done; but if the Metropolis took the lead, they would follow.

Mr. HEINMANN also supported the proposal, but pleaded, amid some laughter, that it should be established on an international basis. We exported more building manufactures abroad than we received, and when it was remembered how largely Lincrusta Walton was used in his native land, there ought not to be prejudice evinced against goods simply because, like himself, they had been "made in Germany."

Mr. P. A. GILBERT WOOD said the proposal to found a Builders' Exchange was one that demanded grave consideration of ways and means before being adopted; but if it were decided upon by the trades, it must be carried into effect with a vigorous will and a determination to make it a success.

The closing toast was "The Chairman," proposed by Mr. PERCY A. RANDALL, and in replying, he said, while this gathering had primarily been intended to do honour to the promoters of the exhibition, it had promoted good fellowship among exhibitors, and had led to a practical discussion that he hoped would eventuate in the establishment on a firm basis of a Builders' Exchange.

Before leaving, the party united in singing, upstanding and in orthodox fashion, "Auld Lang Syne" and the National Anthem.

#### "LONDON—AN APPRECIATION."

UNDER the above title a paper was read by Mr. W. Simms, F.S.I., at the general meeting of the Surveyors' Institution on Monday evening last. The paper was most interesting to all concerned in the development of London and its resources, but was so full of detail and of facts that it is impossible here to give more than a resumé of the author's views and recommendations. The subject was, Mr. Simms said, a wide one, and had many phases which escaped the notice of the casual observer. The vastness, the might, and the beauty of London were hardly adequately appreciated even by its

inhabitants, although poets like Wordsworth, artists like Canova, authors like Ruskin, had gone into raptures over its many and ever-varying beauties. It was true that Cobbett, in his "Rural Rides," was very bitter in his denunciations of the "Great Wen"; but in spite of him, and in spite of the fact that the "wen" had grown and grown year by year, there were men who yet believed that London deserved some little meed of praise and admiration. A modern author had called London "a squalid village"; but this he thought was rather the brilliant paradox of a philosophic novelist than a candid statement of hard facts. When this author said there was no street in London worthy of the name except the Embankment, he obviously overlooked Portland-place or Northumberland-avenue or Whitechapel High-street. He thought that most persons, if given the choice of a spot in which they should permanently reside, would select London, in spite of all its faults of climate and management, even as Dr. Johnson preferred it to all other places. During the period since, say, 1869, or about a generation, there had been carried out the great works of the Holborn Viaduct and the Embankment; parks had been opened, some hundreds of acres had been added to the spaces dedicated to the public use, and theatres, clubs, churches, hotels, polytechnics, railway stations, and other buildings had been erected on a scale of magnificence never before attempted in any city. Within the five-mile radius there were now no less than 53 open areas, apart from cemeteries, squares, and private grounds, representing a total of 4,246 acres, or an average of 80 acres each, all within half-an-hour's drive of Charing Cross. And this did not include Richmond, Wimbledon, Greenwich, Blackheath, or the Crystal Palace. A careful survey of all the open spaces, going down to squares, churchyards, &c., showed that out of the 32,000 acres included within the four-mile radius, some 8,000 acres were open ground, while the so-called occupied areas, comprising streets, houses, forecourts, and gardens, covered little more than four times the extent of the open spaces. The "lung spaces" of London covered about 25 per cent. of the entire area. The greater part of London was also well endowed with open spaces in the shape of broad gardens and squares, and the Metropolitan Gardens Association were labouring earnestly to extend the area of these, especially in the poorer neighbourhoods, having already accomplished some 320 works of the kind, and having many more in hand. The Kyrle Society and others were also doing much valuable work in beautifying and brightening the surroundings of the poorer members of the community. During the last half-century the City of London alone had paid to the Metropolitan Board of Works 1½ millions, to the County Council some 1¼ millions, to the School Board over 2¼ millions, to the Common Poor Fund more than a million and a half, and to the Asylums Board three-quarters of a million. This insignificant-looking square mile on the map of London had, during the last fifty years, spent on an average £614 a day on public improvements and services. The countryman who pictured London as a "wilderness of bricks and mortar," was astonished to find that from Charing Cross he could walk for three miles in a straight line through parks, and that from the Embankment he could obtain some of the finest prospects in the world. Mr. Simms added, as appendices to his paper, a list of the dates on which, and the circumstances under which, the many important improvements in London had been inaugurated, and also a tabulated list of the parks and open spaces at present available to the public, which although exceedingly interesting are too lengthy to reproduce here.

Mr. T. Blashill, Superintending Architect to the L.C.C., moved a vote of thanks to Mr. Simms, remarking that in London, as in all large cities, there was room for any amount of criticism, if one lost sight of the whole subject, and instead of grasping the large points, magnified the small ones. London must be considered as a whole, if London questions were to be dealt with satisfactorily. No one who was afraid of its vastness could ever take any real steps to improve it. Nothing was so big that it could not be dealt with by mastering the details, and ability to deal with the large came from a careful attention to the small. London had been called "squalid," and if squalor meant dirt, it had been truly so described; but he feared that if all the dirt could be removed, London would horrify its inhabitants

when its naked architectural defects were exposed to view. In many European cities it was customary to wash the houses completely once a week, and the streets even three or four times a day, and the cleanliness of the people corresponded with, if it did not actually result from, the cleanliness of their surroundings.

Mr. W. Woodward agreed with Mr. Blashill as to the value of the paper, and with the author that, with all its faults, London was, after all, the finest city in the world. It possessed the most splendid Protestant Cathedral, the finest Gothic abbey, and, in the Tower Bridge, the grandest example of engineering, besides many remarkable specimens of architecture and construction.

Mr. Wheeler, Q.C., speaking as a vestryman of the richest parish in England (Kensington), entirely agreed with the author of the paper, but differed from Mr. Blashill in thinking London a dirty or squalid city. He believed, and was convinced from personal experience that he was right in his belief, that the squalor and dirt resulted not so much from the surroundings as from the habits of the people. Street for street, square for square, area for area, London was as clean as any city in the world.

Mr. Simms, in replying to the vote of thanks, said that he had not attempted to deal with the whole subject, but had been obliged to content himself with occupying the short time at his disposal by looking at one phase only, and endeavouring to point to what had been done as an encouragement to those who had London's welfare at heart to do still more in the direction of making it a city worthy in every way of the unique position which it occupied.

#### LOAN COLLECTION OF PICTURES AT THE GUILDHALL.

A LOAN exhibition of pictures by painters of the British School who have flourished during the Victorian era was a good idea, and the collection now on view at the Guildhall will be appreciated by all lovers of painting. As illustrative of the developments of pictorial art the exhibition is not, perhaps, complete; many of the early water-colourists are absent, and the school of Impressionists are unrepresented, but on the whole the display is pretty complete. Looking over the pictures in the large gallery, many notable canvases which have adorned late exhibitions at the Royal Academy are conspicuous; as, for instance, we note a few splendid works by Colin Hunter, A.R.A., Peter Graham, R.A., and Henry Moore. "The Herring Market at Sea" (lent by the Corporation of Manchester), by the first-mentioned painter, looks as fresh and strong in colour as when we saw it in the Academy in 1884. The group of steamers owned by herring dealers following the boats, the rippled sea, with its inimitable colour and reflection of early dawn on Loch Fyne, the bright sky still attract and command admiration. Briton Riviere, R.A., is represented by a great work, "In Manus Tuas Domine," a noble picture. But we pass on to notice in rapid succession works by W. F. Yeames, R.A., "Queen Elizabeth receiving the French Ambassador after the Massacre of St. Bartholomew"; Lady Butler's historic "Roll Call"; D. Maclise's "Banquet Scene (Macbeth)"; W. P. Frith's now popular picture of "Ramsgate Sands," well known from engravings; and the later productions of Lord Leighton, such as his splendid sleeping Iphigenia, with Cymon attracted by her beauty, the draped figure bathed in golden light; W. Q. Orchardson's famous picture of "The Young Duke," another stately composition, in softened light of amber hue; Wyke Bayliss's noble interior of the "Church of St. Lawrence, Nuremberg," lent by the Corporation of Liverpool; the beautiful classical subject of L. Alma Tadema, "The Women of Amphis"; S. J. Solomon's "Judgment of Paris"; Frank Bramley's "Hopeless Dawn," and several others, many of which are known to visitors of the Academy of recent years. In this gallery we must not forget to notice a miniature portrait of Her Majesty by Mrs. Corbould Ellis, and Mr. Edward Hughes's portrait of H.R.H. the Princess of Wales.

Perhaps more interest attaches to the collection in the upper galleries. Gallery II. contains examples by Sir David Wilkie, R.A., "The Penny Wedding," lent by the Queen; by William Collins, R.A., "Rustic Civility," lent by the



Duke of Devonshire; three Turners of much beauty, two of which are the "Going to the Ball" and "Returning from the Ball," Venetian subjects, the first a barge of gaily dressed ladies. These are late examples, but valuable ones. His "Departure of Adonis for the Chase," painted in 1806, belongs to his earlier manner of fine Titian-like colour. We also notice William Muller's celebrated "Chess Players," remarkable for breadth of handling and brilliancy of colour. David Roberts's grand interior of the "Duomo, Milan" is worth inspection, also a fine Constable, "Fording the River," G. H. Mason's long canvas "The Harvest Moon," in a warm decorative key of colour, full of harmonies; J. W. North's subtle hilly landscape, full of spring sunlight, "The Sweet Meadow Waters of the West"; Cecil Lawson's large picture, "The Hop Gardens of England," Sir J. E. Millais's "The Gambler's Wife," and works by G. F. Watts, R.A., J. S. Cotman, Sir E. J. Poynter, P.R.A., G. H. Boughton, R.A., Sir Edwin Landseer, R.A.—all admirable examples of their masters. In the third gallery we come to a unique collection of fine works by D. G. Rossetti, Sir J. E. Millais, W. Holman Hunt, Ford Madox Brown, and others of the Pre-Raphaelite Brotherhood. Nothing can be more beautiful than Rossetti's "The Beloved" (or "The Bride"): "She shall be brought unto the King in raiment of needlework; the virgins that be her fellows shall bear her company," &c. This work was painted in 1865, and is sumptuous in colour and brilliancy of tone, still full of delightful harmony in the grouping of the fair maidens, their flowers, tissues and jewels, with the bride in the centre. Sir J. E. Millais's famous picture of "A Huguenot on St. Bartholomew's Day refusing to wear the Badge" is well known.

Passing on, we come to Henry O'Neill's "Last Moments of Raphael," a finely-painted work, full of touching interest; W. Holman Hunt's work, "May Morning on Magdalen Tower, Oxford," strongly pre-Raphaelite, almost reminding one of a Florentine picture of the 14th century in its almost grotesque hardness, but yet with earnestness of spirit. Next is "Scene from 'Two Gentlemen of Verona,'" lent by the corporation of Birmingham, representing Valentine rescuing Sylvia from Proteus, and shows the earlier pre-Raphaelite at his best, painted in 1851. This, too, is hard but sumptuous in colour, and earlier in date than the last. Rossetti is again represented in "A Vision of Fiammetta," painted in 1878—a splendid piece of rich colour. The rich scarlet-draped figure and the blossoming almond are yet full of decorative beauty and poetic meaning. "The Blind Girl," by Sir John Millais, is an early work, and we note Ford-Madox Brown's clever little subject, "The Last of England," a reminiscence of the emigration movement of 1852; the fine "St. Cecilia" of J. W. Waterhouse, R.A.; several beautiful works by L. Alma-Tadema, including that gem of technique, "Love's Jewelled Fetter"; and works by Watson Nicol, Marianne Stokes, J. M. Strudwick, F. D. Hardy, John Brett, A.R.A., painters whose works bear the impress of the higher impulses of the era.

#### THE BLACKWALL TUNNEL.

AT the ordinary meeting on Tuesday of the Institution of Civil Engineers, the paper read was on "The Blackwall Tunnel," by Mr. David Hay, M.Inst.C.E., and Mr. Maurice Fitzmaurice, B.A., B.E., M.Inst.C.E. Communication between the north and south banks of the Thames below London Bridge was very poor, and many attempts had been made during the last hundred years to give greater facilities for crossing. Tunnels had been begun between Tilbury and Gravesend in 1798, and between Limehouse and Rotherhithe in 1805, while Brunel's great tunnel between Wapping and Rotherhithe was begun in 1825 and finished in 1842. Various other schemes for tunnels had been brought forward, but that at Blackwall was the only one which had been commenced. The contract for the work was let in 1891 for £871,000, and operations were started early in 1892. The entrance to the tunnel on the north side of the river was in the East India Dock-road, close to the East India Dock gates, while at the south side the entrance was in East Greenwich. The total length of the tunnel was 6,200ft., of which about one-half was "cast-iron lined," the remainder being "cut and cover" and "open approach." A considerable amount of work was

necessary for the diversion and reconstruction of main and branch sewers which were interfered with by the tunnel. The open approach at each extremity of the tunnel was constructed with concrete and brick retaining walls with a facing of white glazed bricks and a concrete invert. A layer of asphalt was carried round it to ensure watertightness. The cut-and-cover work consisted of four or five rings of brickwork in cement, and was circular in section; it was backed with a minimum of 2ft. of concrete, and a layer of asphalt was interposed between the brickwork and concrete. There were four shafts on the line of the tunnel, and these were placed at the horizontal or vertical changes of direction. They were constructed of steel and iron double-skinned caissons, of 58ft. external and 48ft. internal diameter. They had also an internal lining of white glazed brickwork. Two openings for the tunnel were provided in each caisson, which were closed when sinking by easily-removable iron plugs. Air-tight floors were placed above the tunnel openings, so that compressed air could be used either while sinking or while the tunnel was being driven through. Two of the shafts had been sunk by keeping the water pumped down and excavating inside in the ordinary way; one by excavating the material (gravel) by a grab worked from a crane on the top, and the fourth partly by grab and partly by manual excavation. In both the latter cases, however, the concrete and iron floors at the bottom of the shafts had to be inserted under compressed air. The "iron-lined" portion of the tunnel was constructed by means of a shield, and compressed air had been used for nearly the whole length, the pressure varying between a few pounds and about 27lb. above the atmospheric pressure. The external diameter of the cast-iron lining was 27ft., and the internal diameter 25ft. and 25ft. 4in., each ring of lining forming a length of 2ft. 6in. of tunnel. There were 14 segments and one key-piece in each ring; all the sides of the segments were planed, and all the joints caulked. The internal lining consisted of 4 to 1 concrete with glazed-tile facing. The tunnel was driven through materials of a very mixed nature, varying between hard water-tight clay and coarse ballast in direct communication with the river. Near the centre of the river the tunnel passed within 5ft. of the river-bed, but for some distance on each side of this point a layer of clay 10ft. thick had been shot from hopper-barges to facilitate operations. On two occasions the tunnel was flooded by sudden "blow-outs" and the consequent inrush of water. The shield used was 27ft. 8in. in external diameter, and 19ft. 6in. long. It was shoved forward by hydraulic jacks which exerted at times a total pressure of over 5,000 tons. It carried two hydraulic erectors for placing the cast-iron segments. Every precaution was taken in the construction of the shield to minimise the result of accident from a sudden inrush of water, and provision was made for working with either a closed or open face. A very large air-compressing plant was required to maintain the supply of air, and at times as much as 10,000c.ft. per minute was pumped into the tunnel. The roadway, which was 16ft. wide, was carried on a brick arch, which formed the roof of a subway for pipes, electric-light wires, &c., and a footpath 3ft. wide was provided on either side. An electric-light installation had been erected for the permanent illumination of the tunnel and the supply of current for working the drainage-pumps, &c.

#### THE REPORT ON THE L.C.C. WORKS COMMITTEE.

THE report of the Special Committee appointed by the London County Council to inquire into the management and financial position of the Works Department was submitted to the London County Council on Tuesday, but its consideration was adjourned till after the Easter recess. The report cites a statement of Mr. E. Waterhouse, one of the assessors, that the total amount of the fabricated entries was £7,229; they had no reference to any misappropriation of moneys, but were simply false statements as to the cost of various works, the apparent cost of some being decreased by amounts which were included in the cost of others. The committee state that on this subject they have nothing to add to the remarks of Mr. Waterhouse. They concur with the recommendation of both the assessors that, with a view to the prevention of similar practices, the

bookkeeper should be made independent of the manager. On the general question, the committee are satisfied that some definite organisation for the direct employment of labour and the direct execution of public works by the Council is desirable and beneficial. They think that both engineering and architectural works can be undertaken by the Works Department, at any rate without loss, and on the whole with advantage. It is significantly stated that the relations of the Council with contractors are not at present the most advantageous. They recommended the substitution for the Works Committee of a Works Board, including one representative from each of nine committees of the Council, and offer other recommendations for the better control of works undertaken by the Board and of the expenditure incurred. They proposed that any committee desiring to propose to the Council the carrying out of any works without the intervention of a contractor shall, in the first instance, obtain an estimate from the proper officer, and then refer such estimate to the Works Board for their consideration before reporting to the Council. That the standing orders be amended by the insertion of words coupling the unions of employers, where such exist, with the trade unions in reference to the rate of wages and hours of labour. The minority of the special committee have prepared a long report, contending that the operations of the department in regard to architectural works have resulted in a loss, setting forth objections to the methods and proceedings of the Works Committee, and advocating the abolition of the Works Committee and the placing of the Works Department under the chief engineer of the Council.

#### MANCHESTER ROYAL INFIRMARY.

[WITH ILLUSTRATIONS.]

THIS is the elevation, and these are the principal plans, of the design by Messrs. J. W. Simpson and E. J. Milner Allen, which has been chosen, and was awarded first place in the late select competition, on the advice of the referee, Mr. Alfred Waterhouse, R.A. There can be no doubt as to the admirable character of the scheme thus depicted. The site of the buildings is that occupied by the present hospital, which stands on an isolated plot facing Piccadilly, and flanked by Portland-street and George-street, with Parker-street to the rear. The problem presented to the architects was a by-no-means easy one, seeing that the materially enhanced accommodation, both for patients, and consequently for an increased staff, had to be as nearly as possible restricted by the extent covered by the old buildings, so as not to encroach upon the open spaces on all sides, and at the same time not to needlessly increase the height of the infirmary as a whole. The in-patients on the medical side number 90 males and 80 females, on the surgical side 160 males and 90 females, giving a total of 420. Two operating theatres, adjacent to one another, and a lecture theatre for 200 students, form part of the scheme. The chosen plan is a remarkably good one, and the reduction of the open space is only a fraction over 5 per cent. of the present area. The open space now is 13,440 yards superficial, and the plans for the new building show the open space as 12,744 yards superficial, a reduction only of 696 yards superficial. Although so little ground is covered, the wards are only three or four stories high, and the administrative block is of five stories. Thorough and easy intercommunication is combined with distinct isolation. The walls of the wards and rooms of main building will be lined with smooth cement, painted and varnished; the floors laid with oak parquet, paraffin polished. The interior of the out-patients' hall, chapel, and central entrance-hall will be of washable terracotta. Oak or American walnut will be used throughout for the joinery. The work of rebuilding is divided into five contracts in a very convenient and well-thought-out manner, so as to permit the work of the hospital to go on in the mean time, and the site will by these means be spared from encumbrance by the erection of temporary buildings. The total estimated cost is stated at £126,923 15s. 10d., an equivalent of less than £300 per bed.

Plans for the rebuilding of the church and tower of St. Giles, Rowley Regis, Staffordshire, at a cost of about £10,000 have been submitted and approved. Messrs. Lewis Sheppard and Son, Worcester, are the architects.



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## Our Illustrations.

## MUNICIPAL BUILDINGS, DOUGLAS, ISLE OF MAN.

IN our issue of Feb. 12 last we illustrated the view and plans of the selected design by Mr. Arthur Ardron for the above building. To-day we publish the design which was awarded the second premium, of which Messrs. Wigg, Oliver, and Hudson, of London, and Mr. Frank L. Heslop, of Douglas, are the joint authors. The awards were made on the recommendation of Mr. John Woolfall, vice-president of the Liverpool Architectural Society. The ground and first-floor plans which accompany the view sufficiently elucidate the arrangements.

## ABERDEEN MUNICIPAL LODGING HOUSE.

IN planning this building the chief aim has been to obtain throughout perfect natural light and ventilation, together with such an arrangement as would prove thoroughly convenient, and at the same time permit of proper supervision and control with as few attendants and in as economical a manner as possible. In such a building it will be found that the form of dormitory, to a large extent, influences the general arrangement of the remainder of the building, and it will be here noticed by those acquainted with the details of such buildings that the Aberdeen plan differs in respect to its arrangement of dormitories from most lodging-houses, and that not without advantage. At the outset it was deemed by the architects to be imperative, if the building was to be equal to, or better than, the most recent of its class that each cubicle or sleeping-place should be against an outer wall, and be provided with an independent window, and that there should be good cross ventilation in all the dormitories, as well as top light and ventilation to such rooms as the lodgers' kitchen, latrines, laundry, &c., where it is desirable that the fumes from the cooking, steam, &c., should be quickly got rid of through the roof. To do as here proposed, which means the abandonment of the "island" cubicle, with its many objections, so common in Glasgow and other Scotch lodging-houses, several methods have been adopted, as, for instance, in the case of Lord Rowton's building at Vauxhall, where the dormitories, with a single row of cubicles on either side, are arranged on the four sides of a quadrangle with the single-story, top-lighted portions in the inclosed area; or, as at the County Council lodging-house in Drury-lane, where the dormitories are much wider, and the cubicles opening off galleries are arranged in tiers round a central well-way, extending

from the first floor to the roof, and having an opening lantern at the top. This latter plan is no doubt an excellent one, but in Aberdeen would not be appreciated, owing to the similarity between the gallery cubicles and the cell arrangement of the prisons in that district; in any case, the shape of the site does not lend itself to such an arrangement, so that, with the same object in view as were evidently sought after by the designers of the examples referred to, a somewhat original plan is obtained, based, in the case of the upper floors, on what is usually termed the pavilion system, while the intervening spaces on the ground floor are occupied in part by those rooms requiring top light and ventilation. Entered in about the centre of the front pavilion a roomy corridor runs right through the three blocks to the rear of the buildings, where a large cemented airing-court is provided for the use of the lodgers, and containing barrow-shed, &c. From this corridor, continued up on all the floors, access is gained to all that portion of the buildings devoted to the use of lodgers, the staircase being in the centre, and the whole under the observation from the office of the caretaker on the ground floor, and on the dormitory floors from the warders' bedrooms, situated at one end of the upper corridors. The accommodation is for 250 men, there being three floors of dormitories, all practically alike. One of the smaller dormitories opening off the staircase will not be divided up into cubicles, but is to be reserved as a sick-room. All the dormitories are disconnected from each other by the cross-ventilation in the corridors connecting them, so that in the event of a case of infection any single dormitory might be temporarily cut off from the remainder. A staff staircase, linen shoot, and a lift, running the full height of the building, connect the dormitories with the laundry and staff department at the rear, and a private door adjoining the warders' rooms on the upper floors shuts this portion off from the lodgers' apartments during the night, and at daytime allows free access to the dormitories for the staff without the necessity of their coming into contact with, or passing through, any of the rooms occupied by the public. A gate at the foot of the stairs precludes admission to the dormitories during the day, but for the convenience of the lodgers, clothes-changing rooms are provided, which do away with any necessity for access to the dormitories during the day. A large recreation and reading-room, measuring about 42ft. by 38ft., and a combined dining-room and kitchen, fitted up with hot plates, hot-water fountains, sinks, and lockers, are provided near the front, the former overlooking East North-street, and containing platform and lockers. Lavatories, baths, feet troughs, and other sanitary arrangements, as well as a boot-room and good wash-house, fitted with drying-horses, troughs, &c., are easily accessible to the lodgers. Necessary cooking utensils will be lent to the lodgers as required, and, without leaving the dining-room, they will be in a position to obtain soup, tea, potatoes, and such provisions as are on sale at the shop which is provided in charge of the office attendant. A good staff washhouse, ironing-room, linen store, dirty linen receiving-room, as well as a disinfecting room, are so arranged as to permit of the work being carried out in proper routine, without confusion or retracing of steps; the linen to be cleansed would be thrown down the shoot mentioned above, into the receiving-room, taken direct to the disinfecting-room, if necessary, thence to the washhouse, passed through the ironing-room into the linen store, and from there to the lift, near to which, on each floor is placed a dormitory store, where it would be stored until required for subsequent use. The caretaker's rooms occupy the ground-floor of the front pavilion to the left of the entrance, and his living-room communicates with the office and shop. The whole of the warming and hot-water supply will be provided by means of a low-pressure steam boiler, the flue from which would be carried up in the centre of a large air-shaft into which vitiated air-trunks from the dormitories will be connected, the heat of the boiler-flue causing a constant suction, and so carrying off the products of combustion and respiration. Apart from the opening windows, fresh-air will be admitted under the window-sills, and in passing over the steam-pipe before entering the building would be warmed in winter. The buildings will be erected in granite, and the floors will probably be of fireproof construction. The estimated cost is between £10,000 and £11,000. The accompanying illustrations will give a good idea of the external appearance and the internal

arrangements. The architects for the work are Messrs. Marshall and Dick, of Newcastle-upon-Tyne, whose design was selected in open competition, and who were also appointed architects for a similar building for the Newcastle Corporation, which has not yet been proceeded with.

## THE MILLENNIAL EXHIBITION BUILDINGS, BUDA-PEST.

WE have little to add to what was said last week, when we gave the first sheet of our illustrations of these most interesting exhibition buildings, designed by Mr. Ignác Alpar, of Buda-Pest. To-day we print two more photographs, showing the Mediæval gateway and the French Renaissance pavilion. The fountain adjacent to the Gothic hall adds to the picturesqueness of the grouping of the courtyard. Some of the general views of these exhibition buildings seen over the water are exceedingly pictorial, and, indeed, are wonderfully good.

## HOUSES AT MANSFIELD.

THESE houses have recently been erected on the summit of an eminence about a mile out of the town, and the windows command extensive views over the surrounding dales. The house in foreground, erected for Miss Chadwick, has the walls faced externally with the yellow limestone from the neighbouring quarries at Mansfield Woodhouse, and the roofs are covered with red pantiles. The builder is Mr. John Greenwood, of Mansfield; and the architect Mr. H. Harrington, A.R.I.B.A., of London.

## MANCHESTER ROYAL INFIRMARY.

(For description see page 522.)

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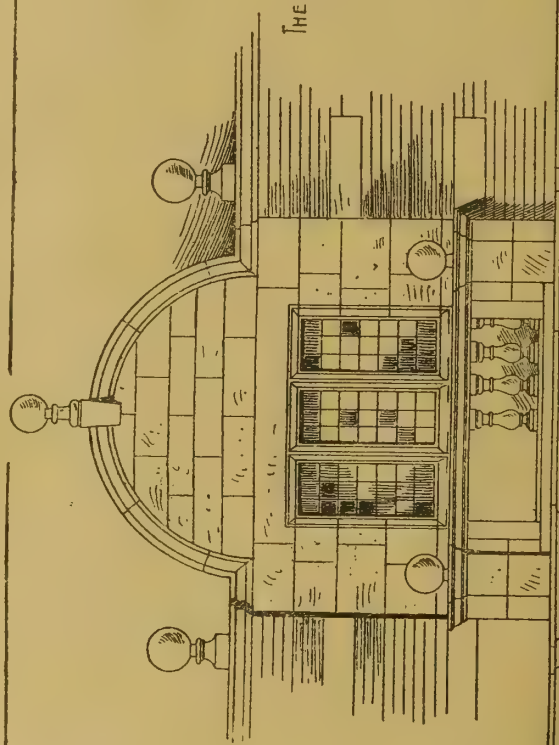
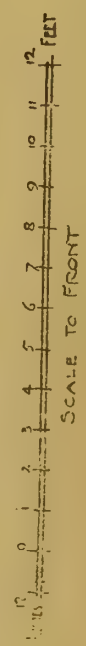
TO-MORROW (Saturday), the 10th inst., Mrs. Humphrey Ward, the celebrated authoress, is to lay the foundation-stone of this building, which is now in course of erection on a fine corner site in the main high road at Edmonton, in memory of Charles Lamb and John Keats, whose famous names are so prominently associated with the locality for the advantage of which Mr. Passmore Edwards is presenting this public library. The accompanying perspective view and the plans given, with a large-scale detail of the entrance front, clearly illustrate the external design and internal arrangements of the building, which stands, together with an ample garden plot, well set back from the roadway. To the left of the entrance-hall is a large reading-room facing the south, thus securing a sunny aspect. The glazed screen in the central archway opening into the hall is provided to facilitate supervision. The lending library is situate to the right of the entrance, with an extensive counter and borrowers' lobby, at the end of which is placed a show-case, where presentation volumes and any special books can be on public view. A staff lavatory, &c., is contrived to the rear, beyond the officers' stairway leading to the book-store. On the first floor the magazine-room comes over the news-room, and the reference-room opening out of the book-room overlooks Lower Fore-street. Upstairs again the library department rooms are continued, as shown by the second-floor plan. The librarian's residence entrance is on the south front; his living-room is on the first floor while the kitchen, &c., and bedrooms are located over. Compactness of plan was essential in contriving these arrangements, and the condition that the utmost space available for the public use should be secured very largely determined its apportionment. Lawrence's red brick facings are being used for the walls, with Portland stone porch, and the other masonry is in "St. Aldhelm" Box Ground. The metal casements are by Messrs. Burt and Potts. The heating by Messrs. Strobe. The quarry glazing by Messrs. Aldam Heaton and Co. The glazed bricks are by Messrs. Cliff and Co. The builder is Mr. Arthur Porter, of Tottenham, and the clerk of the works is Mr. Jno. C. Laight. The architect is Mr. Maurice B. Adams, F.R.I.B.A. The site was purchased by the District Council of Edmonton, who, with Mr. Passmore Edwards's aid, are erecting the building as described. The fittings are to be executed in pitch-pine.

Contracts have just been let for the extension of the technical school at Huddersfield. The cost of the structural alterations to be undertaken will, with the fittings, be about £12,000.



PASSMORE EDWARDS  
PUBLIC LIBRARY.

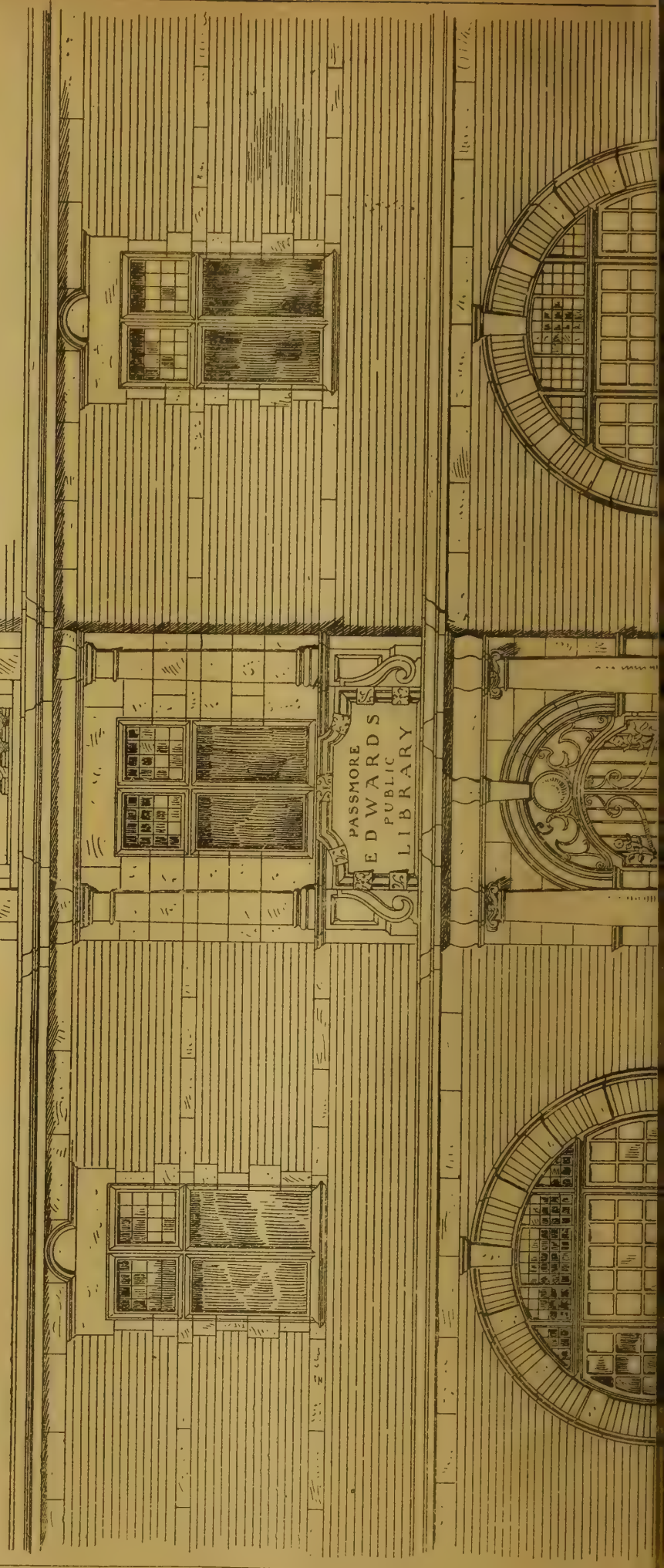
LOWER EDMONTON  
MAURICE B ADAMS FRIBA ARCHT



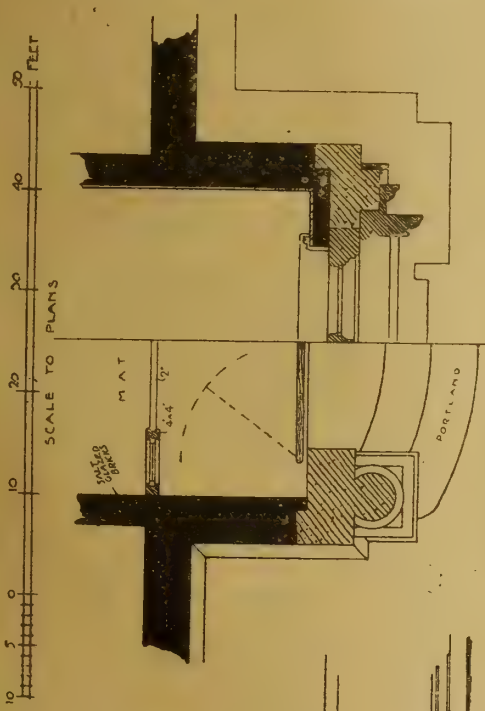
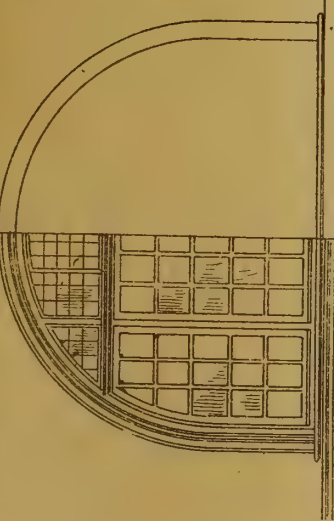
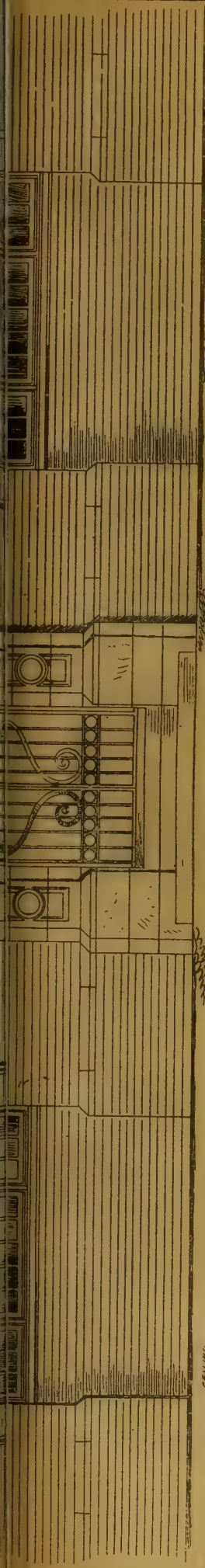
LAMB & KEATS  
MEMORIAL

THE FOUNDATION STONE TO BE LAID APRIL 10<sup>TH</sup>  
BY  
MRS HUMPHREY WARD

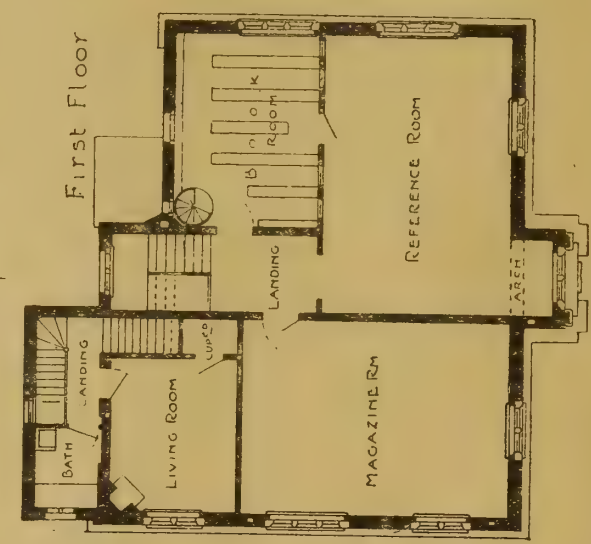
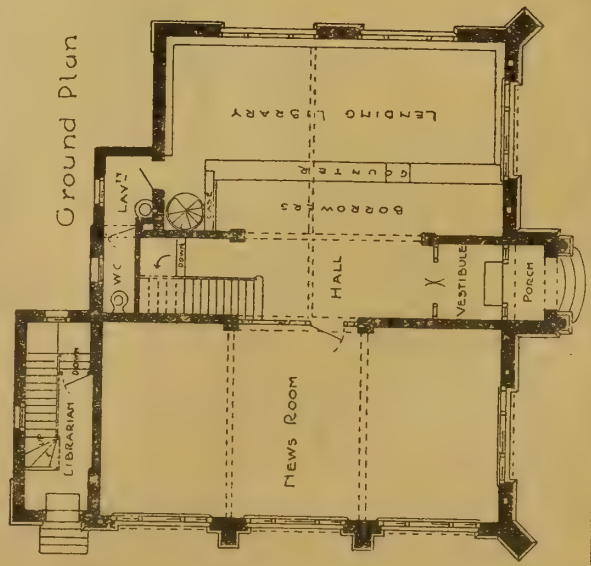
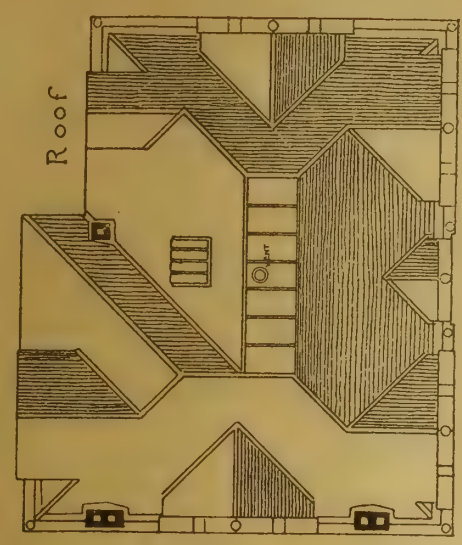
DETAIL OF FRONT







SCALE TO PLANS  
0 10 20 30 40 50 FEET



W.



FEDERATION OF WEST OF ENGLAND  
MASTER BUILDERS' ASSOCIATIONS.

A CONFERENCE of representative master builders of Bristol, the West of England, and South Wales was held in Bristol on Tuesday for the purpose of considering the advisability or otherwise of forming a federation for this district. The chair was occupied by Mr. A. Krauss, president of the Master Builders' Association, who was supported by Mr. W. Church (vice-chairman), Messrs. G. Humphreys, C. A. Hayes, R. Wilkins and Son, and Mr. A. S. Scull; Cardiff was represented by Mr. W. Symonds and Mr. James E. Turner; Bath by Mr. Jesse Hayward and Mr. C. H. Long; Weston-super-Mare by Mr. W. Dyer and Mr. C. Addinott; Taunton, Mr. A. J. Speller; Bridgwater, Mr. J. Harris and Mr. W. H. Ketch. The Chairman said it was now a month since they had last met, and in the mean time the various associations had been furnished with a copy of the Lancashire Federation rules, and he should be glad to hear from them the opinions of their respective association as to the formation of a federation for the West of England and South Wales. The meeting then proceeded to the discussion of the rules for the federation, the principles of which are conciliatory to the operatives, and provide that in all cases of dispute with them the federation should do its utmost by arbitration or otherwise to avoid strikes or lock-outs. If the operatives refuse any equitable settlement of the dispute affecting any member of the federation, the matter will be brought before the executive committee, and if they decide that the members affected are to be supported, each branch and every member thereof will do their utmost to bring the dispute to a successful issue. The general constitution will consist of a union of district associations connected with the building trade throughout the districts referred to, and also such individual members of the trade as are not members of any district associations. The mode of election of representatives and the government of the federation were discussed, and it was arranged that the rules as submitted at the meeting should be printed and circulated amongst the various associations, and that the first meeting of the federation should be held in Bristol on the 18th May.

WASHABLE DISTEMPER AND OXIDISED  
ENAMEL.

WE have received from Aspinall's Enamel, Limited, of New Cross, S.E., samples of their "Wapicti" and "Wapicti Liquid," which will be found useful by all painters and decorators. The "Liquid" is a preparation for stopping the suction of walls and other surfaces, and for priming all kinds of new woodwork, saving coats of much more expensive paint, and much labour in the preparation of ordinary priming. It will not decompose, chip, crack, or peel off, as size frequently does.

The "Wapicti" is a washable distemper, easily used, and for cheaply covering large surfaces where the cost of paint is an item has many advantages. It is used mixed with an equal quantity of the "liquid," the mixture being laid on as a fresh coat. For the second coat the "Wapicti" is beaten up with water to a creamy consistency, and as thick as it can be worked freely. If very decided colours are used, or the work is to stand weather, half "liquid" and half water should be used with the second coat, as in both cases the "Wapicti" requires greater binding property to stand washing. If a fine finish is wanted the last coat should be stippled. The "Wapicti" is made in all colours. The sample we have tried is a very pretty light azure.

The sample of "Oxidised Enamel" sent us is a very useful general decorative white, made thin, so as to work easily and flow under the brush. It dries moderately quickly, eventually becoming very hard. It is ready for use, and only needs a little turpentine if it gets thick by exposure to the air. If wanted to dry more slowly a little turps and linseed oil can be added.

There is no doubt that the readiness of application of "Aspinall" is one of its chief recommendations to the ordinary public, but we do not at all regard the various preparations as fit only for the amateur. Architects, builders, and decorators are finding it greatly to their advantage to specify and use them, on account of their always good-alike quality, the economy of useless labour, and the avoidance of waste. They are largely used by the London County Council, the

Corporation of London, and other public bodies, and the "Wapicti" is specially suitable for use on the walls of asylums, churches, hospitals, prisons, &c. The "Enamel" is absolutely non-poisonous, and a gallon will cover about 70 square yards on a non-porous surface, and is equal to about three gallons of ordinary paint.

## BOOKS RECEIVED.

*The Law Relating to Civil Engineers, Architects, and Contractors*, by L. LIVINGSTON MACASSEY and J. A. STRAHAN (London: Stevens and Sons, Ltd., 12s. 6d.), was first published in 1890, and was intended primarily for professional readers. It, however, deservedly obtained considerable acceptance among lawyers, local authorities, and public companies concerned with contracts for works, and in this, the second edition, the authors have attempted to make the book more fitted for legal readers. The references to cases are fairly comprehensive, and the sensible avoidance, as far as possible, of the ordinary technical language, renders the book easily comprehensible. A useful chapter is added on Arbitrations.

## CHIPS.

At Attleborough, near Nuneaton, a new Liberal clubhouse was opened last week. It has cost over £1,000, and has been built from designs by Mr. F. J. Yates, architect, of Colmore Chambers, Birmingham. The contractor was Mr. J. T. Stanyon, of Attleborough. The front is Late Domestic Gothic in style, and is of Heather bricks with stone dressings.

The Unopposed Bill Committee of the House of Commons on Monday passed the Great Western Railway Extensions Bill, which has already been sanctioned by the House of Lords, authorising the Great Western Railway Company to construct a railway twelve miles in length from Truro to Newquay, thus placing Newquay within easy access of Falmouth, the Lizard, and Penzance, via Perranporth, St. Agnes, and Scorrier. The time given within which to construct this railway is five years.

Mrs. Matthew Gray has undertaken to build a new church for West Hartlepool, at a cost of £10,000, in memory of her late husband, the eldest son of Sir William Gray, the shipbuilder, of West Hartlepool.

The building trade at Cleethorpes is in a very brisk state just now, the comparatively mild weather which has prevailed having been taken full advantage of by the builders. A large number of houses have been erected in various parts of the town, while along High-street a number of business premises have been erected.

To the west front of Salisbury Cathedral has been added a figure representing the prophet Daniel, the gift of Mr. J. Bennett Stanford. The effigy has been designed and executed, with the approval of Sir Arthur Blomfield, by Mr. Nicholls, of Lambeth, who designed Bishop Moberly's monument. The figure occupies one of the niches in the topmost tier. Mr. Bennett Stanford has intimated his intention of enriching the cathedral with further gifts of this kind from time to time.

The General Post Office in Victoria-street, Liverpool, is approaching completion. It was designed by Mr. Henry Tanner, F.R.I.B.A., of H.M. Office of works, who is locally represented by Mr. G. H. Woolven, clerk of works. The style is Italian Renaissance, and the building has a frontage of 280ft., and side façades of 300ft. each, the site being isolated. The contractors are Messrs. Thornton and Sons, of Liverpool, and the carving is being executed by Mr. E. O. Griffith, of the same city.

Chancellor Fergusson, of Carlisle, recently unveiled two windows in Brampton parish church, to the memory of the late Rev. Henry Whitehead. The windows have been designed by Sir Edward Burne-Jones, and the principal one consists of four lights, representing the Prophets, and is placed in the baptistry. Another stained-glass window, known as the "Children's Window," was also unveiled. The subject is Eli and Samuel.

At the annual distribution of prizes to the successful students at the School of Art, Durham College of Science, Newcastle, Mr. Archibald M. Dunn, president of the Northern Architectural Association, gave an address on the subject of "Art in Relation to Architecture and our Everyday Life," in the course of which he remarked that, "without art, architecture is dead, lifeless, a mere mass of bricks and mortar."

A testimonial is about to be presented to Mr. W. S. Till, on his retirement from the office of city surveyor of Birmingham, and in acknowledgment of the administrative ability, courtesy, and high personal qualities he has displayed throughout his fifty years of public service in that city.

## OBITUARY.

MR. PHILIP JOHN MESSENT, C.E., the engineer to the Tyne Improvement Commission, died in Westbourne Park, W., on Monday. Suffering from a painful internal complaint, he proceeded to London a few weeks since to consult a specialist, and had been staying at the house of his sister, where he passed away, at the age of 67. Mr. Philip John Messent was born at Dover, Dec. 7, 1830, and educated at Wickham. He served his articles with Messrs. Walker, Burgess, and Cooper, of London, and was twice married, and had two sons and five daughters. One of the sons is Mr. P. G. Messent, Civil Engineer to the Bombay Port and Harbour Trust. Before coming to the Tyne, Mr. Messent was engaged superintending the improvement of Harwich Harbour and the construction of Harwich Breakwater, the construction of Dovercourt Lighthouse, and the construction of an iron bridge across the river at Yarmouth. Mr. Messent went to the Tyne on April 3, 1855, and assumed sole charge of the work, as representative of Messrs. Walker, Burgess, and Cooper. The work of constructing the piers commenced on Oct. 2, 1855, and in the case of the North Pier was carried out by Mr. Lawton, under contract, which expired in 1864. Since that time the work has been done by the River Tyne Improvement Commissioners, under the sole charge of Mr. Messent. The South Pier was commenced under the same conditions as the North Pier, the work beginning in 1856, and the contract in this instance was also carried out by Mr. Lawton till 1864, and afterwards by Messrs. Oldroyd and Marshall, of South Shields, till 1868, after which time the work was carried out by the Tyne Commissioners, under the charge of Mr. Messent. In 1870 Mr. Messent was appointed also to take charge of the river works, with the late Mr. J. F. Ure as consulting engineer. On the death of Mr. Ure, in 1882, Mr. Messent was appointed sole engineer to the Tyne Improvement Commissioners, and he has had sole charge since that date. He designed the mammoth crane for extending the masonry superstructure of the piers without staging. Besides the piers construction, Mr. Messent designed the lighthouse on the South Groyne, at the entrance to the Tyne, and he also designed and constructed the lighthouses on the North and South pierheads. When he came to the Tyne the river from Shields to Newcastle was a series of shoals, and first under Mr. J. F. Ure—who prepared a comprehensive scheme for the improvement of the whole of the tidal portion of the river—and then under Mr. Messent, the works that have changed the stream, and made it one of the chief commercial waterways, have been carried out. As arbitrator or consulting engineer, Mr. Messent was well known, and among others he was engaged at the following large works:—Thirsk Waterworks arbitration, Manchester Ship Canal construction, Tees Conservancy Commissioners' Piers and Harbour Works, Stockton Corporation Jetty, Southport, Ribble Navigation, Aberdeen Pier and Graving Dock Aire and Calder Navigation, Hartlepool Dry Dock, Barrow-in-Furness, Skinningrove Harbour, Warkworth Harbour, Newport Harbour, Swansea Harbour, Scarborough Breakwater, Cardiff Docks, Port Talbot, Berwick Corporation, Edwards' Dock, South Shields; Lower Thames Navigation, Mercantile Dry Dock, Jarrow; Cork Harbour Commissioners, Albany Harbour, West Australia; Hopetown Harbour, Tyne Pontoons and Dry Dock Company's Dry Dock, Wallsend Slipway and Engineering Company's Dock, Forsyth's Dock, South Shields; Smith's Dock, North Shields; Tyne-mouth Corporation, Newcastle Corporation, and many other large dock and river works.

MR. CHARLES JESTY, who died recently at Bere Regis, in his 98th year, came of an old Dorset family, one of whom practised vaccination as a preventive of small-pox before Jenner's famous discovery was made known. The late Mr. Jesty made several roads in the West of England under the direction of Mr. J. L. Macadam, who died as long ago as 1836. He afterwards made the Wimborne and Piddletown turnpike road, and parts of the Southampton and Dorchester and Wilts, Somerset, and Weymouth Railways, but had long ago retired from active business as a surveyor. His son is the present Mayor of Weymouth.

The Marquis of Bath laid the foundation-stone, on Monday, of the Weymouth House Schools, Bath, for the erection of which £5,500 has been subscribed by the supporters of voluntary schools.



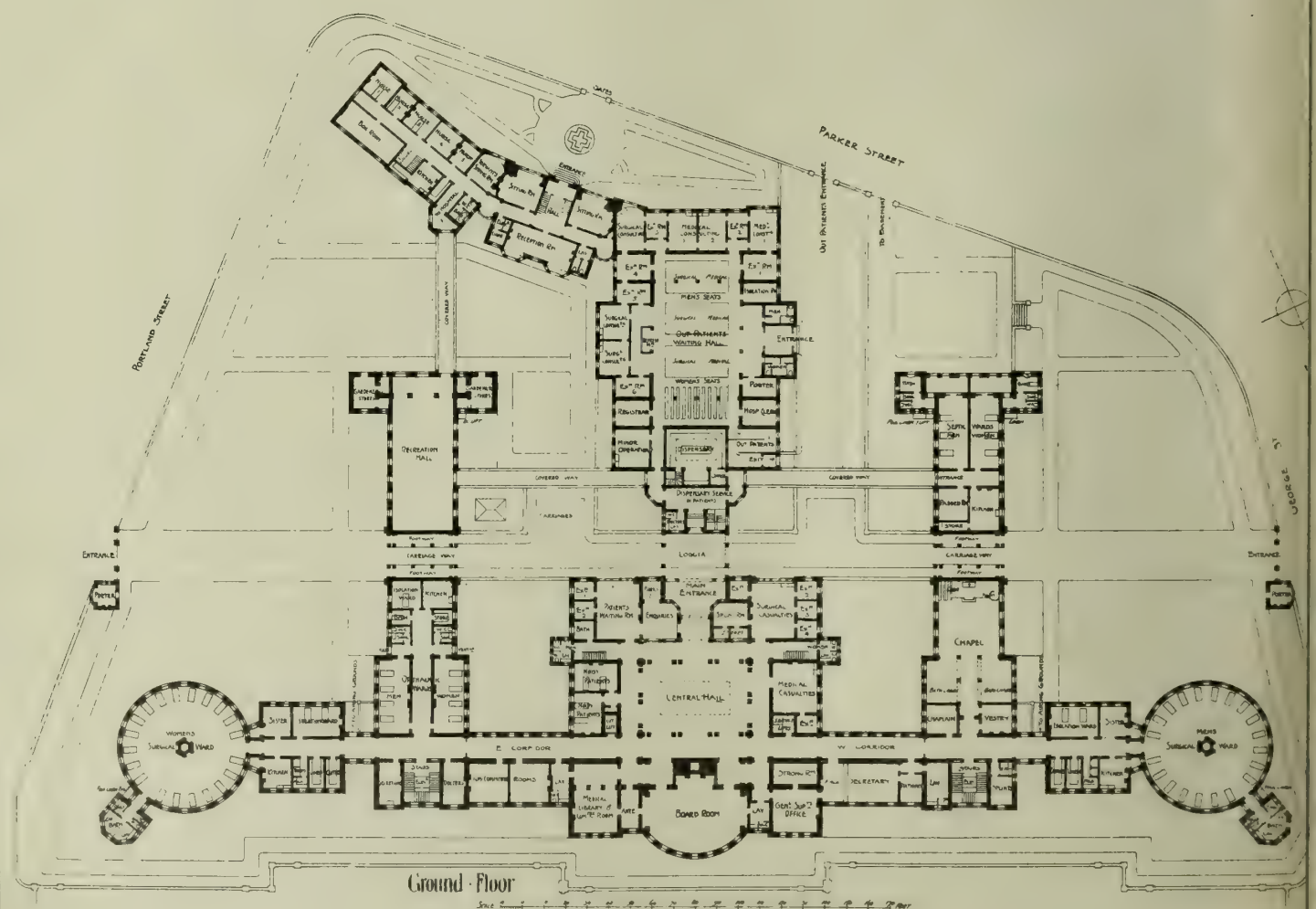






# ROYAL INFIRMARY

SIMPSON & ALLEN



Ground Floor

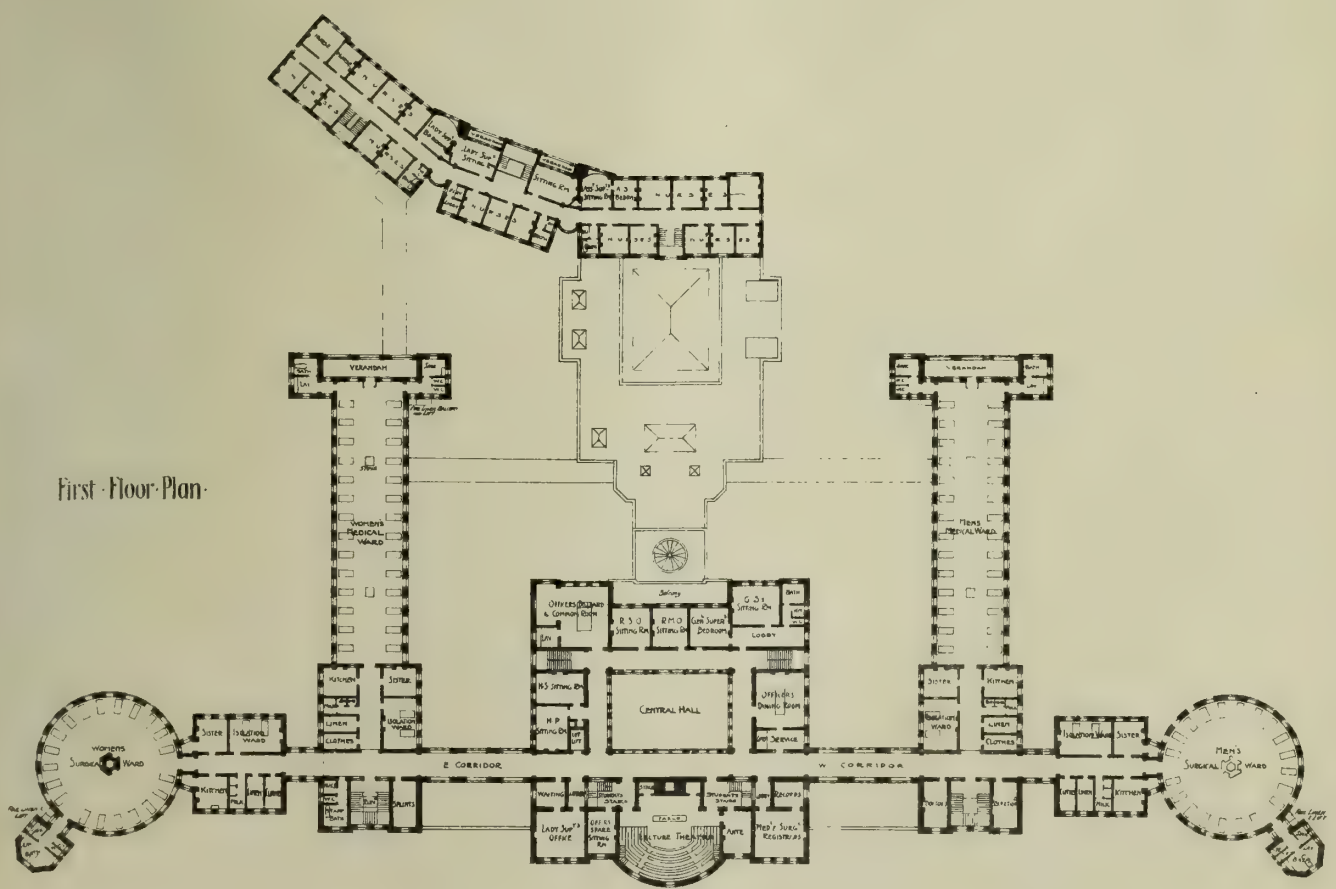


Elevation to Piccadilly.

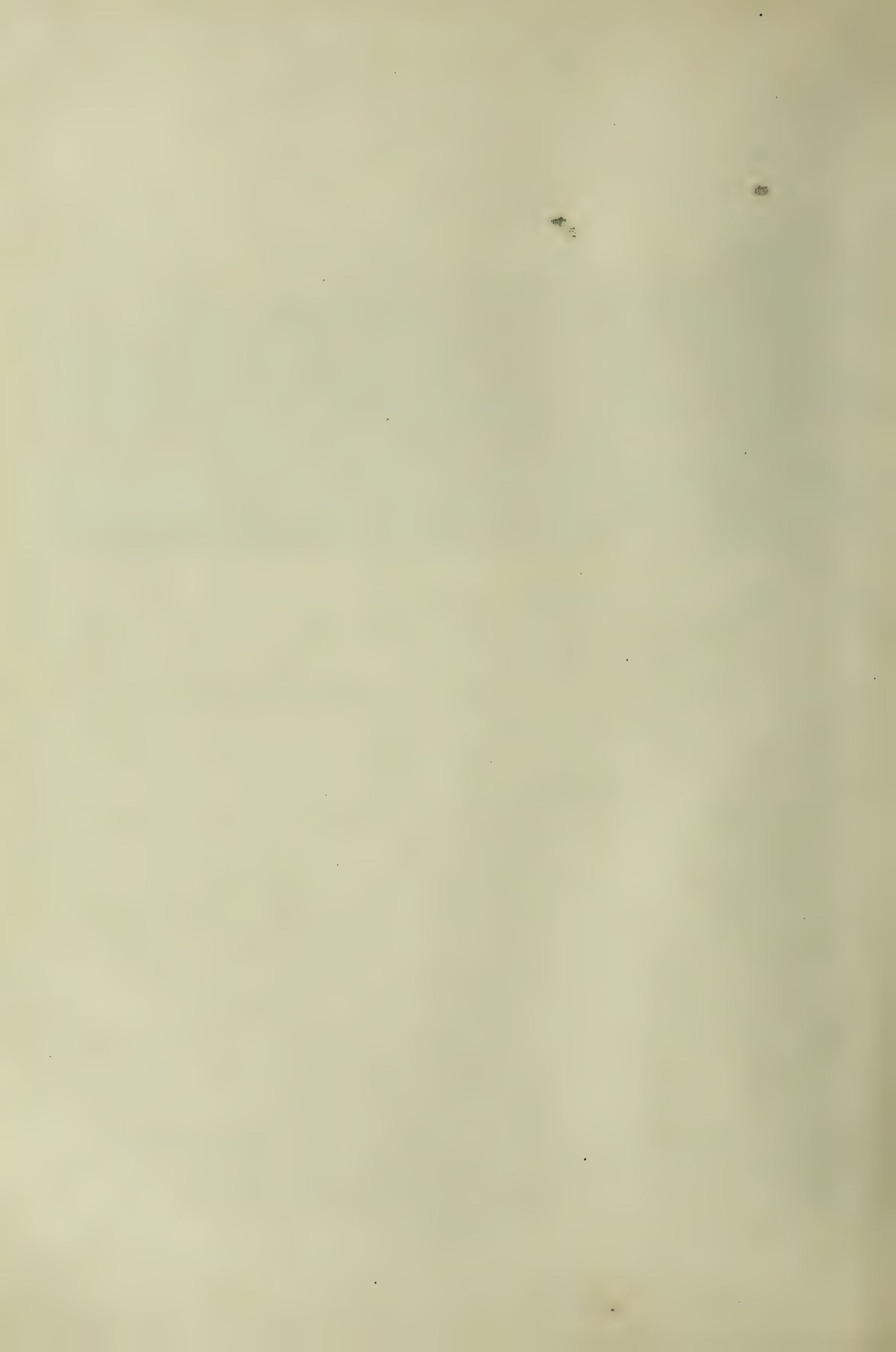


MANCHESTER.  
ARCHITECTS.

First Floor Plan.













MESSRS WIGG, OLIVER & HUDSON, LONDON,  
AND FRANK L. HESLOP DOUGLAS,

MESSRS WIGG, OLIVER & HUDSON, LONDON,  
AND FRANK L. HESLOP, DOUGLAS,

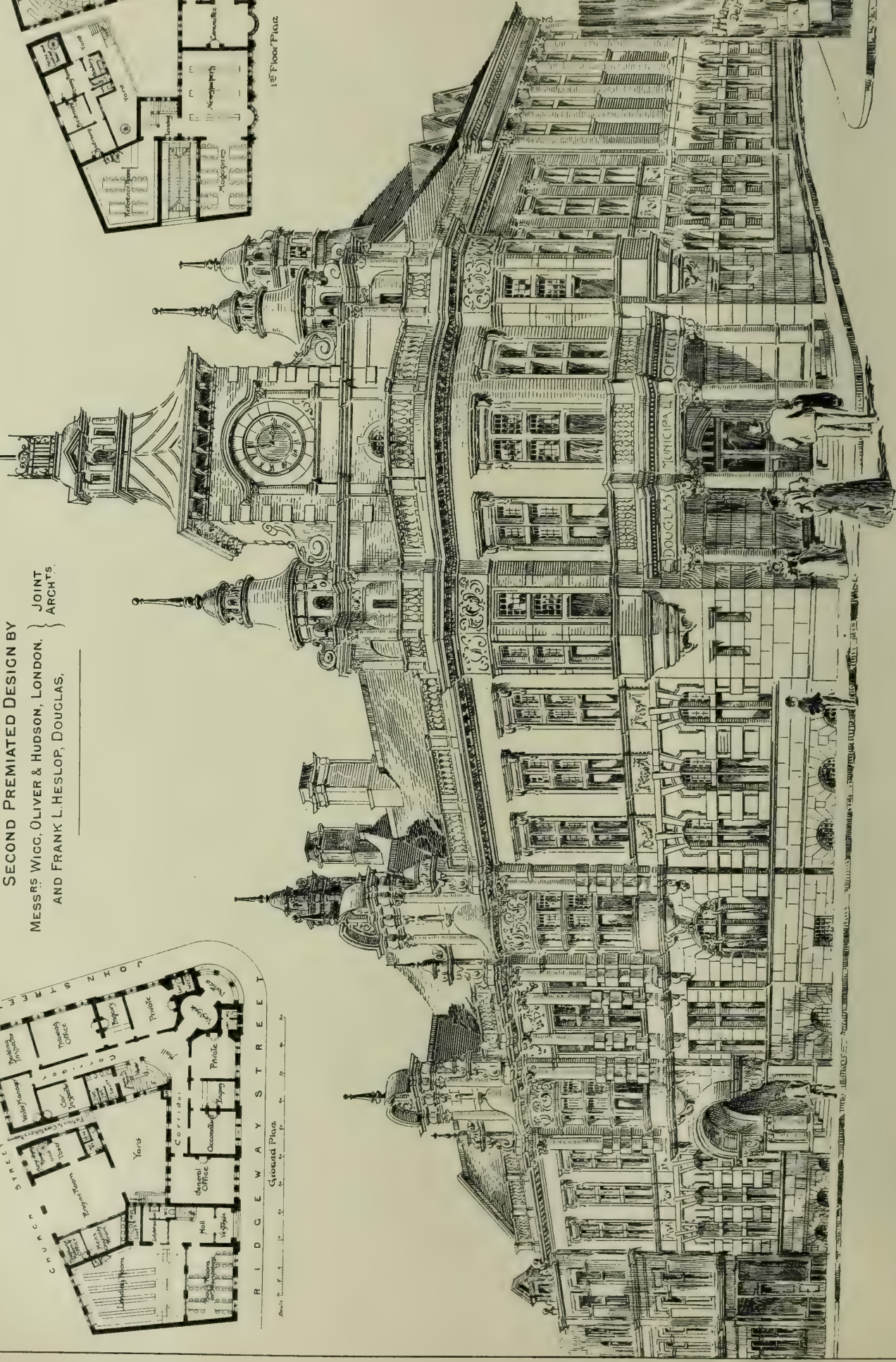
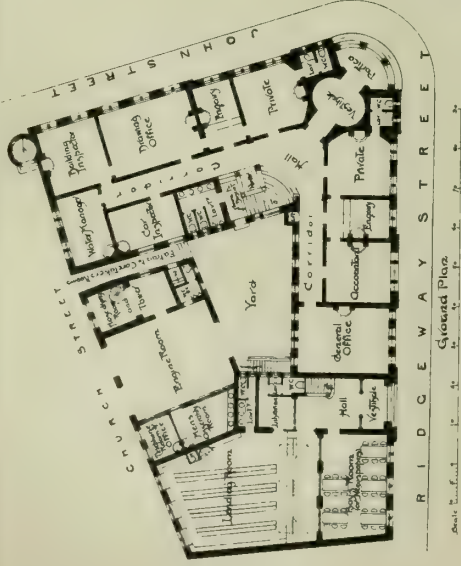
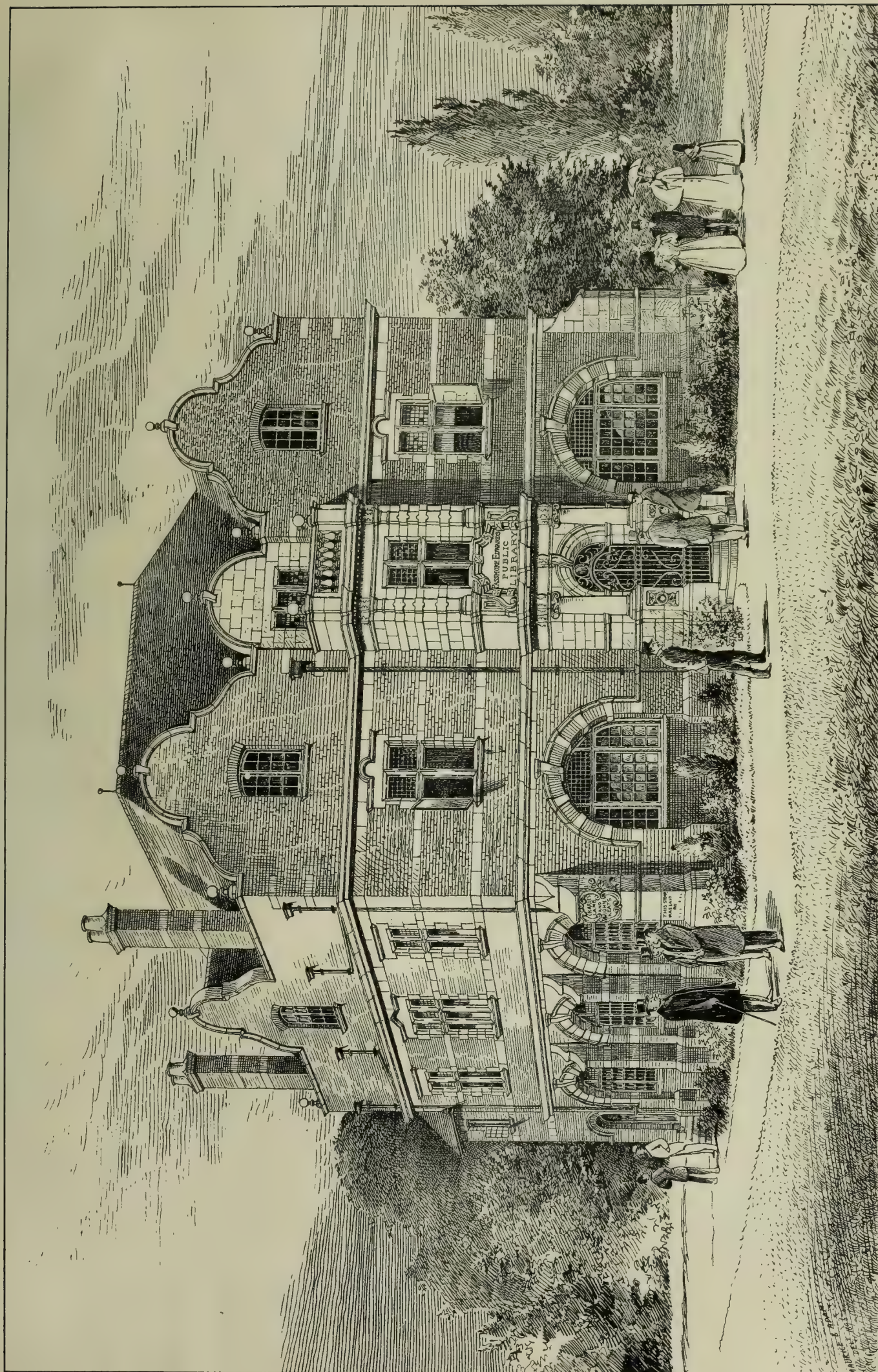


Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.





CHARLES LAMB & JOHN KEATS MEMORIAL

Agents: Messrs. H.B. & Co.

PASSMORE, FRANKS & DUNN, LTD., ARCHT., EDMONTON

MAURICE B ADAMS F.R.I.B.A. ARCHT.

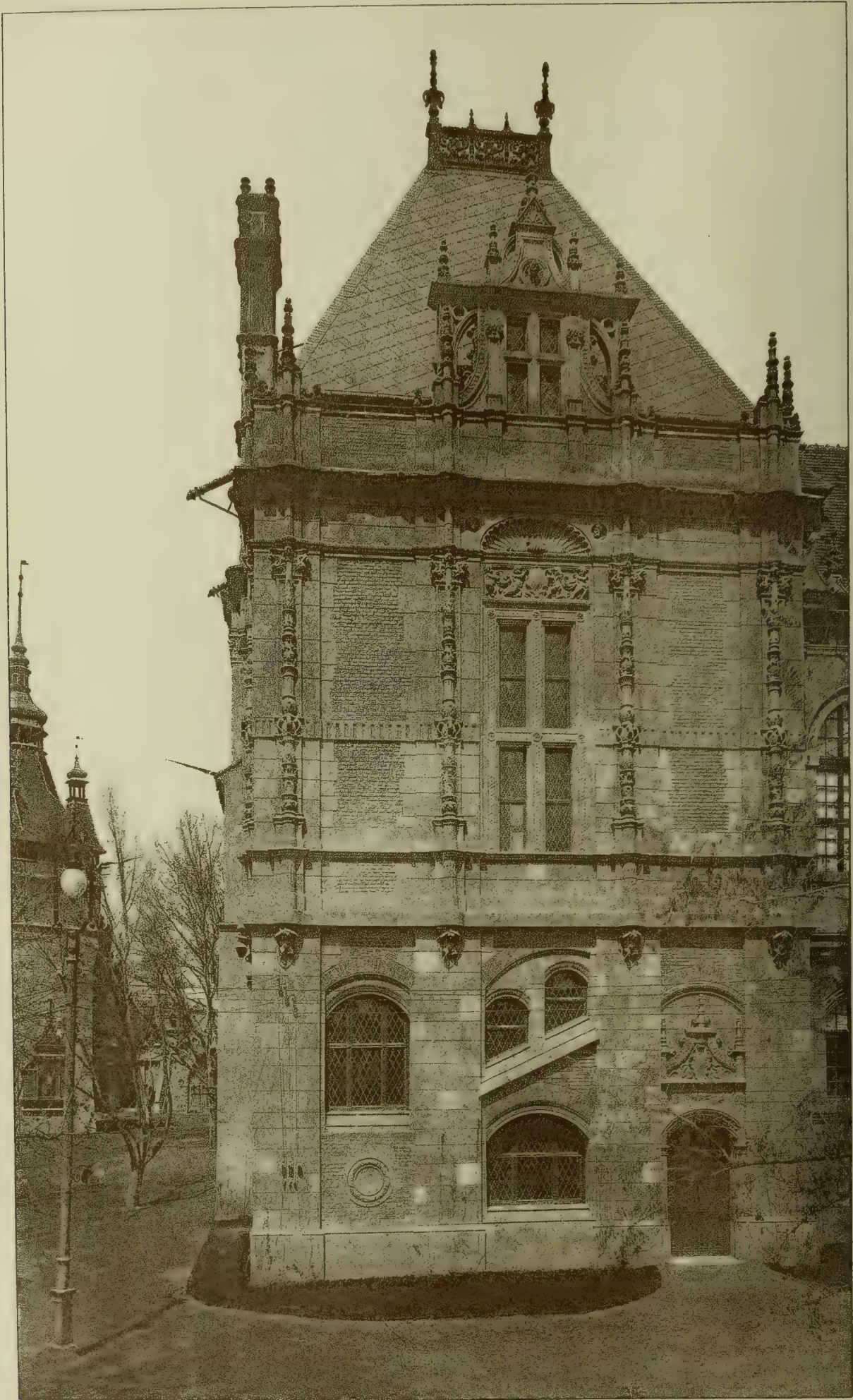












THE MILLENNIAL EXHIBITION BUILDING



APRIL 9. 1897.



"PHOTO-TINT," by James Akerman. 6, Queen Square London, W.C.

GS · BUDAPEST · IGNÁCZ ALPÁR · ARCHT



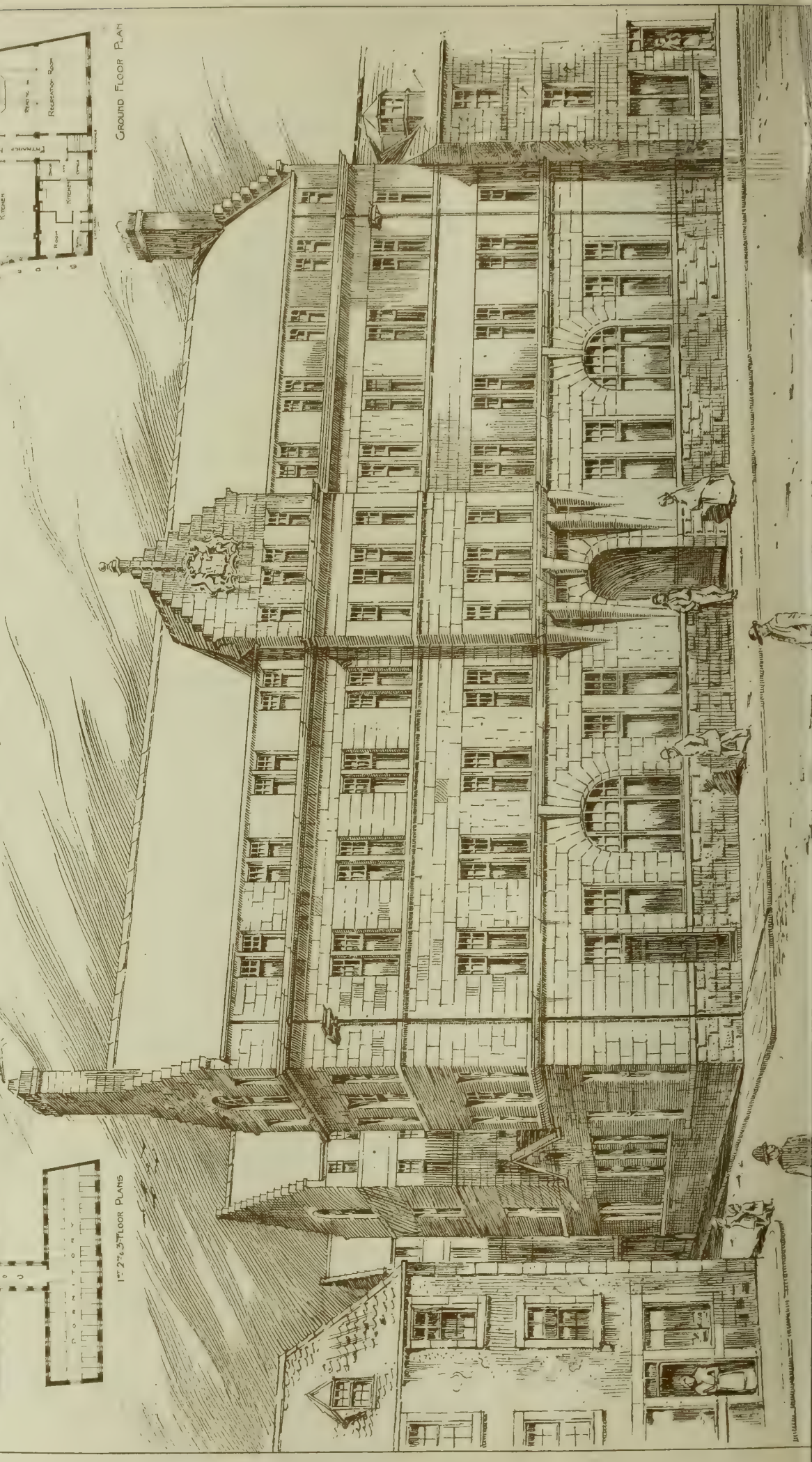
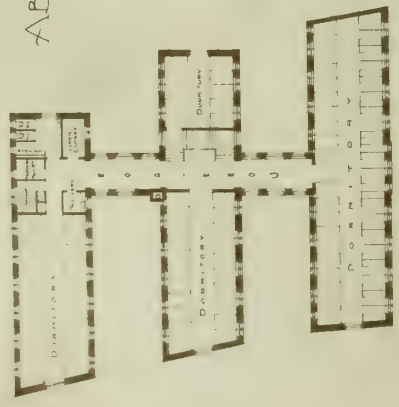






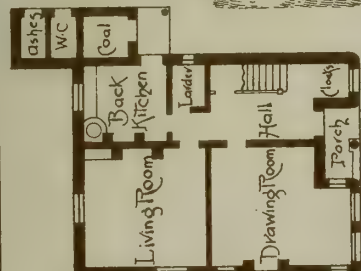
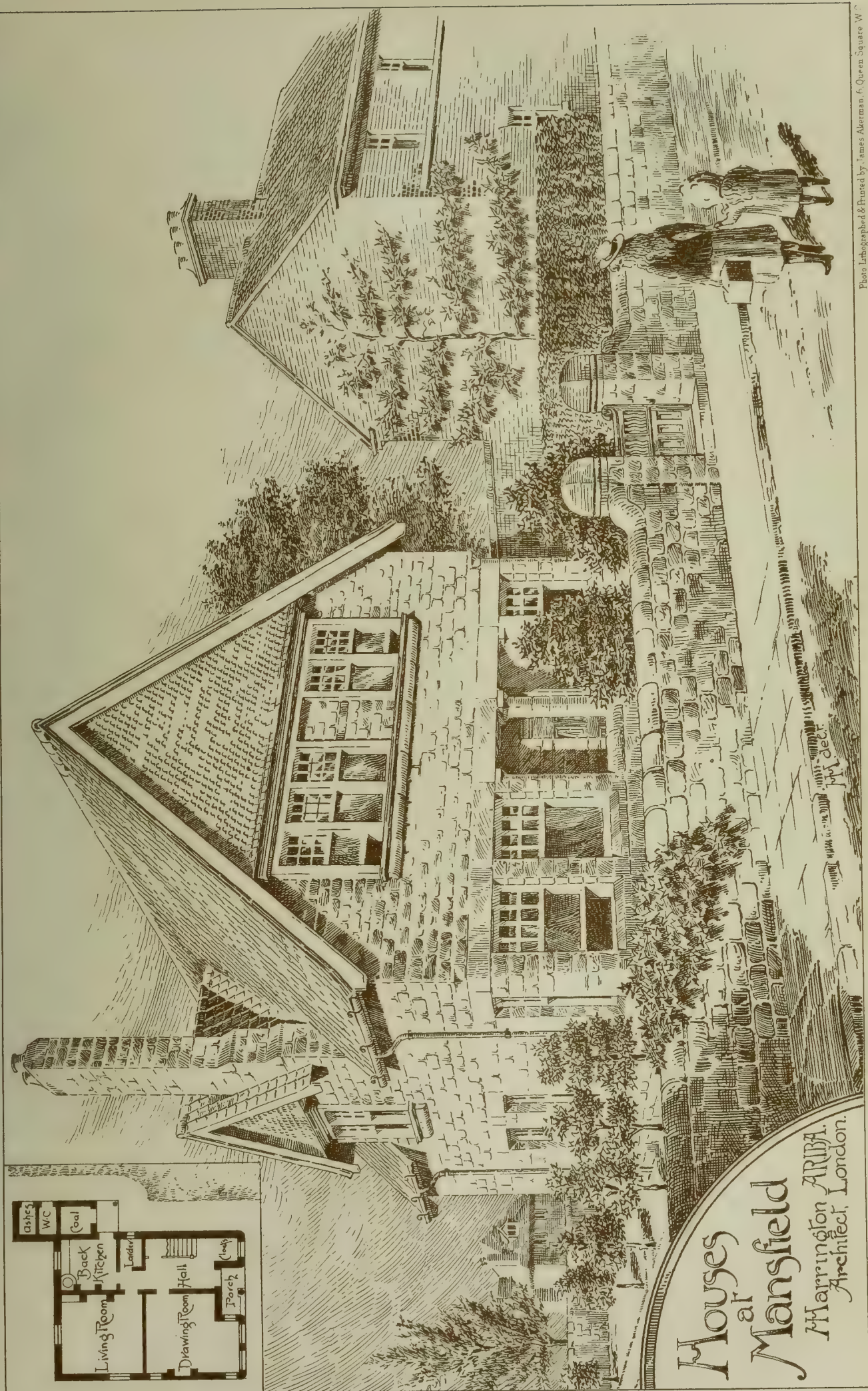


ABERDEEN MUNICIPAL LODGING HOUSE FOR MEN MESSRS MARSHALL & DICK ARCHTS





R. BURNS DICK



Houses  
at  
Mansfield  
Harrington ARBUTHNOT  
Architect, London.

Photo lithographed & Printed by James Alderman, 6, Queen Square W.







## Building Intelligence.

**FAVERSHAM.**—The preliminaries with regard to the new railway-station which is to be built at Faversham were advanced another stage on Thursday in last week, when Mr. G. B. Roche, chief engineer, and Mr. Barker, assistant engineer of the L.C. and D.R. Company, visited Faversham, with the plans of the new station, and met the members of the corporation in conference. After considerable discussion the Town Council approved the entire scheme. The new station will be built on ground now occupied by sheds and a siding, close to Preston-street. The subway or foot-bridge will be constructed just beyond Forbes-road, and from that point the line will spout out into four roads. There are to be two island platforms, each 650ft. in length by 35ft. wide; booking-offices will be provided on both the up and down platforms, and the platforms will be partially roofed. Subways, each 9ft. wide, leading to the different platforms, are also to be constructed. The carpenters' shops will be removed to Whitstable-road, where cattle-pens will also be provided; and the site of the existing carpenters' shops will be utilised to provide carriage accommodation. The total estimated cost is £75,000, and the work is expected to be commenced this summer.

**HEXHAM-ON-TYNE.**—The new branch bank, which has been erected in Priestpottle, Hexham, for Messrs. Lambton and Co., of Newcastle-on-Tyne, was opened for business last week. The building, which has a frontage of 70ft., comprises a banking-room, manager's room, large strong cellars, manager's residence, five offices, and a shop. The walls of the ground floor are faced with grey Aberdeen granite in pitch-faced blocks, and above are faced with T.L.B. bricks and dressings of Prudham stone. The woodwork, including fittings, of the bank is oak, and the floor mosaic and wood blocks. Messrs. W. and J. Darlington have erected the buildings. The whole of the works have been designed by and carried out under the superintendence of Mr. John W. Dyson, M.S.A., of Newcastle, the architect to the bank, and who is now preparing plans for the erection of another branch at Elswick, Newcastle.

**LEEDS.**—The new South Ward Liberal Club in Norfolk-street, the foundation-stone of which was laid on March 14 of last year, is now nearing completion. Constructed of brick, with stone dressings, the premises are two stories high, with a cottage at one corner for the caretaker. On the ground floor is a billiard-room, smoke-room, a room for games, and a reading-room. In the centre is a hall 32ft. long by 18ft. wide, and bar. The basement contains a kitchen, a bath-room, wine and beer-cellars, and heating apparatus. On the second floor is a large assembly-room, which is capable of accommodating 600 persons. It is entered by a stone staircase, surmounted by an octagonal tower, with a bell-turreted roof. Exclusive of fittings, the building has cost £3,500, of which £520 was spent on the site. The plans have been prepared by Mr. Windsor Thorp, architect, of Commercial-street, Leeds.

On Thursday evening in last week, Mr. W. Lax, builder and contractor, of Gladstone-street, Crook, Co. Durham, died at his residence after two months' illness. He claimed to be the oldest resident in Crook. His whole life was spent in that place, and for about fifty years he was established in a business of his own. He leaves a family of ten, two of the sons being employed in business of their own at Crook.

The Unopposed Bill Committee of the House of Commons on Friday passed a Bill reviving and extending the powers for the construction of the underground electric railway from Charing Cross to Hampstead, which was originally authorised by Parliament in 1893.

On Saturday afternoon, at the Esplanade Hotel, Penarth, Cardiff, an arbitration, presided over by Mr. H. F. Edwards, was convened into the claim of Messrs. Mayoh Brothers, contractors for the Penarth Pier, for extras in addition to the contract, and the counter-claim of the Pier Company for delay, &c., in carrying out the contract. After taking evidence the arbitration was adjourned, but it was anticipated that in the mean time matters would be amicably settled.

The latest offer made by Mr. J. Passmore Edwards is to erect an actors' orphanage in London. Representatives of the dramatic profession will meet at an early date to consider the offer.

## Engineering Notes.

**KENTISH TOWN.**—The Midland Railway Company are widening their main line from four to six tracks for a mile and a quarter south of Kentish Town, from Carlton-road Junction to St. Paul's-road. The work involves the demolition of a hundred houses, the excavation of about a quarter of a million yards of stiff London clay, the construction of bridges or covered ways under fourteen streets and two railways, the erection of a retaining wall a mile and a quarter in length and 25ft. in average height, the rebuilding of three passenger stations and a main sewer, and the expenditure of about half a million of money. Messrs. John Aird and Sons are the contractors, the works being carried out under Mr. J. A. Macdonald, engineer in chief to the Midland Railway Co. The resident engineer is Mr. G. Macdonald.

### CHIPS.

A deputation from the Birmingham Architectural Association waited on the Lord Mayor of that city on Friday, their object being to impress upon the municipal authorities the importance of the city council taking power to itself under the Birmingham Churches Bill to prevent the replacement of Christ Church, should that building be removed, by any building unworthy of so important a site. The deputation was heard in private.

Mr. R. Walter Knapp, borough surveyor of Christchurch, has been appointed borough surveyor to the urban district council of Farnborough, Hants, at a salary of £200.

A Local Government Board inquiry was held at Woolston, near Southampton, on the 1st inst., by Mr. Rienzi Walton, M.Inst.C.E., into a petition from the rural district council of South Stoneham applying for a provisional order to empower the council to put in force, with reference to certain lands required by them for purposes of sewage disposal for the parishes of St. Mary Extra, Sholing, and Bitterne, the powers of the Land Clauses Act with respect to the purchase and taking of lands otherwise than by agreement. Mr. Wentworth Shields, the engineer of the scheme, explained the proposals.

The Prince of Wales 'aid yesterday (Thursday) the first stone of the new buildings to be erected for the British hospital at Canne.

The official returns from the Estate Exchange show that the aggregate of business at the Mart last week was £115,013, as against £63,788, registered for the corresponding week of 1896. Although the transactions were numerous, the individual sales were not of an important character.

In Friday's list of receiving orders the name appears of Alexander Henry Attwater, of Newlyn House, Aldgate High-street, E.C., and Brighton, architect and surveyor.

The town council of Dumfries have remitted to a committee consideration of a scheme for erecting a new town hall and municipal offices, the outlay suggested being about £10,000.

An inspector from the Local Government Board held an inquiry at Stockport, on Thursday in last week, into the application by the Town Council to borrow £95,000, chiefly for sewage and gasworks purposes. A point in the inquiry was the fact that part of the loan is required for the cost of providing a water-gas plant. This work is done; but the Local Government Board declines to advance the money because of the dangerous character of water-gas.

The mayor of Middlesbrough formally opened on Friday additions to the North Riding Infirmary in that town. The additions comprise a new operating room, two special wards, a lift, and a receiving-room, and had been built and furnished at a cost of about £2,000.

Foundation-stones were laid on Saturday of new church day schools in Leicester-street, Wolverhampton. The buildings will accommodate 600 children, and will cost £3,500.

The large east window in the chancel of St. Giles's parish church, Newcastle-under-Lyme, has been filled with stained glass as a memorial to the late Alderman W. Mellard, mayor of Newcastle in 1856 and 1877, and for some years a warden of the parish church. The principal subject of the window is the Crucifixion, and the work has been executed by Messrs. Hardeman, of Birmingham. The total cost being nearly £1,000.

In the case of James Andrew M'Loughlin, late of Camplin-street, New Cross, S.E., now Coburg-road, Old Kent-road, S.E., builder and decorator, the discharge from bankruptcy has been suspended for two years, ending March 12, 1899.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The seventh ordinary sessional meeting of this society was held on Monday evening in the Law Library, Union-court, Liverpool, Mr. Culshaw presiding. Mr. W. Henman, F.R.I.B.A., of Birmingham, the architect of the new General Hospital in that city, read an interesting paper on hospital construction, and showed a number of working drawings. A discussion afterwards took place, in which Dr. Rushton Parker, Dr. Mitchell Banks, Mr. Moore (of the Royal Infirmary), and Dr. Hope (medical officer of health) joined. Dr. Banks claimed that the most satisfactory form of ventilation for hospitals was the natural one of doors and windows: he had no faith in artificial ventilation by means of apparatus. Regarding the question of heating, he was of opinion that open fireplaces were the most acceptable. These were in use at the Liverpool Royal Infirmary, and gave great satisfaction. A most important point to consider in the construction of hospitals was the kind of material necessary for the walls and floors. In respect to the former he considered glazed bricks, carefully arranged, were not only the cheapest, but the most serviceable.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The members of this society paid a visit on Saturday afternoon to the new building of the Prudential Assurance Company, in Pinestone-street, by arrangement with the architects, Messrs. Alfred Waterhouse and Sons. There was a considerable attendance of members, among whom were Messrs. T. H. Waterhouse, C. Castle, W. Parkin, Alwyn H. Holland, E. Winder, jun., Thomas Winder, C. J. Innocent (honorary secretary), Joseph Smith, C. B. Flockton, J. R. Wigfull, W. J. Hale, and C. F. Innocent. Mr. Haigh, clerk of the works, as representative of the architects, conducted the party over the building, and explained the arrangements and the materials employed. On the motion of Mr. T. H. Waterhouse, seconded by Mr. W. Parkin, and supported by Mr. Joseph Smith and the honorary secretary, a hearty vote of thanks was accorded to the architects and to Mr. Haigh.

The foundation-stone of the Museum of Egyptian Antiquities, which is to be erected to the north of the Kasr-el-Nil Barracks, at Cairo, was laid on Friday by the Khedive.

The President of the Royal Academy was presented with the honorary freedom of the Painter Stainers' Company, and made a member of the Court at the Hall, Little Trinity-lane, on Wednesday.

A Presbyterian lecture-room, schoolroom, and classrooms are being erected at Roath, Cardiff, at a cost of £2,300. The architects are Messrs. Habershon and Fawcner, Pearl-street, and the contractors Messrs. Knox and Wells, Bangor-street.

At a meeting of the Darlaston Urban District Council on Tuesday, it was announced that Mr. Dorsett, of Edgbaston, had made a free gift to the town of upwards of eighteen acres of land in the centre of the town for a people's park and recreation grounds; also land for four entrances to the park. It was decided to accept the gift, and to raise funds to defray the cost of laying out the ground to be opened on Jubilee Day.

Mr. George W. Willcocks, C.E., held a public inquiry on Friday on behalf of the Local Government Board, in the Court-house, Stockport, as to an application for power to borrow £45,000 in respect of sewage works, £36,079 for gasworks purposes, £7,183 for street improvements, £3,000 for improvement of the public baths, £2,016 for the erection of weights and measures office, and £1,922 for the erection of police parade room, making a total of £95,000.

Mr. Wyke Bayliss, the president of the Royal Society of British Artists, will give a lecture in the Galleries, at four o'clock to-morrow (Saturday) afternoon, on "Art in England in Shakespeare's time." Visitors to the gallery on that day will be invited to remain to the lecture.

The governors of Giggleswick Grammar School have accepted an offer by Mr. Walter Morrison, M.P., to build a school-chapel as a memorial of the Queen's Diamond Jubilee. The cost will be from £15,000 to £20,000.

Major Carr, the chief engineer of the London Docks, died on Tuesday evening at Bournemouth, whither he had gone in search of rest. Major Carr, who was 69 years of age, was a member of the Limehouse District Board and a Churchman and Conservative. He was an active supporter of the Volunteer Service, and took a personal interest in social work in East London.



## COMPETITIONS.

**BELFAST CITY HALL.**—After a long discussion regarding the proposed City Hall, the corporation of Belfast accepted, on Tuesday, the plans of Messrs. E. Thomas and Son, Westminster, whose estimate was £150,000. There were three plans approved of by the assessors—viz., those of the following firms: Messrs. E. Thomas and Son, Messrs. Malcolm Stark and Rountree, of Glasgow, and James Miller, of Glasgow. The assessors thought it right to go over the plans themselves, and take the measurements, and give their ideas as to the cost. The site of the new building will be on the quadrangle previously occupied by the old Linen Hall, and on the site facing Donegal place.

## CHIPS.

The British Astronomical Association have accepted the offer of a site in Regent's Park for the erection of a new observatory.

At a sale of old masters, by Messrs. Robinson and Fisher, on Friday, a portrait of a gentleman by Franz Hals, dated 1679, realised 3,350 guineas.

On Saturday, the laying of the memorial stone of the new senior public school for West Calder, N.B., was performed with Masonic honours. The school will cost £5,000, and will accommodate 460 scholars and have a hall for secondary education.

At Bristol Police-court, on Friday, Thomas Francis Ball, assistant surveyor, employed by the Bristol Sanitary Authority, was charged with stealing £135, the moneys of the corporation. It was alleged that the prisoner committed thefts by making up fictitious wages sheets. His salary was £182, and when arrested he had a balance at the bank and the title deeds of property he had purchased, valued at £4,000. A sanitary inspector named Pearce was also charged with theft, and both prisoners were remanded, the prosecuting solicitor intimating that he intended to bring a charge of conspiracy against them.

From the shore of Lake Ngami is announced the accidental death of Mr. John Cameron Christison Beddoe. Mr. Beddoe was by profession an architect, but he had considerable colonial experience, especially in Queensland and in Africa, having served the Chartered Company with credit in their earlier days. He recently undertook the command of the rear-guard of Major Lugard's exploring expedition, involving a march of five months through mostly desert country. This was, however, accomplished, and he arrived at Major Lugard's camp in the Quabao Hills, south of Lake Ngami, on January 9. Three days afterwards he died from injuries received in an accidental fall.

Mr. T. H. Gardner, son of Mr. Richard Gardner, surveyor, Langley Moor, has been appointed assistant-surveyor and inspector of nuisances to the Sedgfield Rural Sanitary Authority. There were upwards of 100 applicants for the post.

At Southwark Police-court, on Friday, the Metropolitan Industrial Dwellings Company were summoned, as the owners of eight blocks of model dwellings in Red Cross-street, Borough, for failing to comply with statutory notices for the abatement of nuisances dangerous to health. For the prosecution it was alleged that there was virtually a cesspit at the entrance of one of the blocks of dwellings, that the closets were filthy, and that there were other insanitary conditions. The death-rate in the tenements was said to be 37·8 per 1,000, as compared with 22·9 for the rest of the parish. Ultimately the hearing was adjourned for a week.

Major-General H. D. Crozier, R.E., Local Government Board inspector, held an inquiry recently at Farsley into the application by the urban district council to borrow £14,700 for purposes of sewerage and sewage disposal.

At Monday's meeting of the Cheltenham Corporation the town improvement committee reported that Mr. E. R. Robson, F.R.I.B.A., had prepared alternative plans and elevations for new buildings on the winter garden site, providing as far as possible similar accommodation to that offered by the plans which came before the council in January. These alternative plans were now submitted to the council, with a recommendation from the committee that tenders should be advertised for in sections. Mr. Ward-Humphreys, in proposing the adoption of the report, said Mr. Robson's estimate of the cost of the second of the alternative schemes was £48,000 for the proposed municipal offices and for the kursal, the total being rather less than the estimated expenditure on scheme No. 1. An amendment was proposed that the further consideration of the schemes for a kursal and municipal offices be adjourned till the May meeting of the council, so as to give the burgesses an opportunity of seeing plan No. 3, and that a public meeting be called by the mayor to ascertain the feelings of the burgesses; but scheme No. 2 was adopted by 15 to 6 votes.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 6s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLII., XLVI., XLIX., LI., LIII., LIV., LVIII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

## GOOD FRIDAY.

Next week the BUILDING NEWS will be published on Thursday. All advertisements for the next issue, therefore, must reach the Office by 3 p.m. on WEDNESDAY next, instead of on Thursday, as usual.

RECEIVED.—J. Thompson.—Designer.—J. B. and Co.—H. B. T.—British Lion.—J. B. Carlton.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED FOR DISTRICT COUNCIL HALL.—"Orb," "Look," "E. G.," "Agon," "Nut," "Geisha."

## Correspondence.

## INSTRUCTION AND CONSTRUCTION.

To the Editor of the BUILDING NEWS.

SIR,—I see that the members of the Architectural Association have lately been to see the works at a new theatre in course of erection, and their attention was drawn to the mode of spanning the proscenium opening—described in the A.A. Notes as "an interesting example of modern fire-resisting construction." There appears first to be a heavy wooden beam of 20in. square, and over that a brick arch in three ribs, whilst from the summit of the arch depends an iron rod to hold the beam up.

I do not know what is the usage with the members of the A.A., but it seems to me that it would be a good practice, after visiting a building, to deliberately discuss what they have seen—of course, in a friendly spirit, but with perfect freedom. Now, Sir, in this instance, what is the use, I would ask them, of this particular beam? I have looked at it on all sides, and I can see no justification whatever for it. The architect, with an appearance of wisdom, says that he put a wood beam instead of a wrought-iron one, as it has been proved that in case of fire wood resists heat better than iron. That is worth discussing. It is not the general opinion, or iron must needs be

discarded for a multitude of cases where now used. In this place, however, I should say that iron would be perfectly safe. If fire occurred, the curtain and scenery would be consumed in a jiffy, whilst the stage and other combustible material below it, and the roof, &c., above, are too far off to place it in jeopardy.

But why should there be a beam there at all? What good does it do? If it had to support the wall above, that would be a reason; but the wall is carried by the arch, and the beam, in the architect's opinion, cannot even carry itself—else why the rod? Then if the brick arch is necessary to do the work, why not let it have the credit of doing so? Why not discard the beam, lower the arch, and let the construction be seen from the auditorium? An elliptical or segmental arch surmounting the opening would be a deal more pleasing than a flat lintel. For after a straight lintel has been put, architects are bent on disguising it by adding quadrants to the haunches and placing arms or other ornament in the centre to take off the unpleasant squareness. The real opening, it may be observed, is formed by the curtain furniture, either real or painted. As a matter of scientific construction, I am quite sure this "interesting example" of a beam would not commend itself to engineers.

I commend the matter to the intelligence of the A.A. Their motto was formerly Build with Truth. *Verbum sap.*—I am, &c., M.

## THE LONDON BUILDING ACT, 1894—THE AERATED BREAD Co. v. SHEPHERD.

SIR,—I cannot understand how surveyors could contend that a party-wall built in 1892 was a new wall within the meaning of the Act. Section 64, subsection 18, reads: "A flue shall not be built in or against any party structure unless it be surrounded with new brickwork at least 4in. in thickness, properly bonded."

The defendant's surveyor contended that a party-wall built in 1892 met this requirement as being new and sound brickwork, evidently forgetting the real object of the section, that the four sides of the flue should be built at one and the same time: otherwise the new work would in time be drawn away from the old by the heat of the flue. Mr. Justice North very properly decided that the flue must be surrounded with new brickwork, put there at the time of the building, and not to use a previously-built wall to form one side of the flue—a decision which is according to law and the experience of practical men.—Yours, &c., HENRY LOVEGROVE.

124, High-street, Shoreditch.

## Intercommunication.

## QUESTIONS.

[11647].—**Stability of Reservoir Wall.**—Will some of your readers kindly give the formula for determining the stability of a reservoir wall, independent of earthwork backing? Molesworth's formula does not say whether weight of wall means per foot of lineal length for moment of stability, and the same applies to the moment of pressure for overturning wall.—L.

[11648].—**Private Street Improvements.**—Will any gentleman kindly explain how the apportionments of private street improvement expenses are arrived at? Supposing the estimate for the making-up, &c., of a private street amounts to £751 11s. 5d., and the total frontage on both sides of the street measures 879ft. 5in., what price per foot should be charged? How can this be done accurately, so that when the several owners' separate amounts are added together, their sum total equals the estimate?—INFORMATION.

## REPLIES.

[11643].—**Drainage.**—The following books on house drainage can be strongly recommended—viz., "Domestic Sanitary Drainage and Plumbing," by W. R. Maguire, second Edition, 12s. (Messrs. Kegan Paul, Trench, Trübner, and Co.); "Sanitary House Drainage, its Principles and Practice," by J. E. Coleman, 6s. (Messrs. E. F. and N. Spon). Both books are copiously illustrated.—SANITAS.

A Local Government Board inquiry has been held at Portsmouth by Mr. R. Walton, C.E., touching applications to borrow £10,000 for electric lighting and £2,122 for works of street improvement.

The annual dinner of the Nottingham branch of the Amalgamated Society of Carpenters and Joiners was held at the Black Swan Hotel, Goose Gate, on Friday evening, when Mr. John Oseroff, late secretary to the branch, presided over an attendance of nearly 100 members. Mr. George Richards, late organising secretary to the society, occupied the vice-chair.



## LEGAL INTELLIGENCE.

**STREET OBSTRUCTION DISPUTE.**—YATES V. GRIMSHAW.—In this case, heard at Manchester on March 30, Vice-Chancellor Ball, Q.C., asked for an injunction to restrain the defendant, James Grimshaw, of Oswaldtwistle, from depositing stone, building and other materials, upon the site of a partly-formed street called Edmund-street, Oswaldtwistle, and from erecting or permitting to remain erected upon the said street any building or structure, and from in any other way trespassing upon the said site, or obstructing the said street. The plaintiff is the owner of certain land and houses at Oswaldtwistle, to which access is given by Edmund-street, the soil of which is owned by the plaintiff. The defendant is the owner of a plot of land fronting on to Edmund-street, and has had plans passed by the local authority for the erection of four houses on the land. The plaintiff alleged that the defendant had for some years past obstructed the street by depositing and storing there large quantities of building materials, and by erecting a building in the street. The defendant's case was that he was entitled to deposit in the street materials required in the erection of his buildings, and that his user of the site had not been more than this. The building in the street complained of was, he said, nothing more than a temporary shed for the protection of his workmen. He also denied that the plaintiff had suffered any inconvenience by the depositing of the building materials, as there had always been a clear passage along such street at least six yards in width. Among the witnesses called for the plaintiff was Mr. Hunter, the surveyor to the Oswaldtwistle District Council, who stated that the street in dispute had never been clear since 1886. During the hearing of this witness's evidence, Mr. Hughes offered, on behalf of his client, to remove the obstruction within such time as the surveyor should consider reasonable, and Mr. Maberly said his client would accept this undertaking. This left only the question of costs to be decided, Mr. Hughes maintaining that the action was frivolous and vexatious, and had been commenced merely with the object of annoying the defendant, and that the plaintiff ought therefore to pay the costs. The evidence was then proceeded with, in order to ascertain whether the plaintiff was justified in bringing his action. After hearing a considerable number of witnesses on both sides, the Vice-Chancellor delivered judgment, directing that the defendant should pay the costs of the action. His Honour said that, in his opinion, the defendant had been using the street unreasonably, and the plaintiff was justified in complaining to the court.

**A TORQUAY BUILDER'S CLAIM.**—In the Queen's Bench Division of the High Court of Justice, Mr. E. Pike, builder, Torquay, recently entered a claim for £320, balance due for work done, against Miss Cook, of Daleth, Torquay. The case was referred to Mr. H. J. Snell, of Plymouth, before whom evidence was laid at Torquay on Thursday in last week. Plaintiff alleged that he carried out work for defendant at her house to the extent of £470, of which he had been paid £150. Defendant objected to the employment of an architect, and he had to take all his orders from her. He laid wood flooring in accordance with a sample selected by defendant, and afterwards received orders for similar floors in the hall and upstairs. He suggested parquet flooring upstairs, but defendant persisted in having a solid floor. Plaintiff declined to draw plans for the conservatory, and at Miss Cook's request plans were prepared by Mr. Appleton, architect. Even then defendant refused to let the architect visit the premises. Workmen named J. Collings, S. Tickell, A. Brock, and J. Pike said the work was carefully done. Mr. G. S. Bridgman, C.C., Paignton, and Mr. G. Davey supported plaintiff's case. For the defence it was alleged that plaintiff did much unnecessary and useless work, and, further, that the work was negligently and imperfectly done. Defendant said she arranged for parquet floors to cost under £21, and did not stipulate for a solid floor. She denied superintending the work, but admitted that from time to time she discharged men in Mr. Pike's employ. She gave no order for the floors upstairs. The pieces of wood were a continual source of danger, as they tilted up at one end when anyone passed over them. She never ordered the work to the greenhouse. For the defence evidence was given by C. E. Ware, surveyor, of Exeter, who estimated plaintiff's work at £376 4s. 11d. The floors were as bad as they could be, and would have to be relaid, and this and other items would cost £170 14s. 3d. J. C. Watson, architect, Torquay; John Gibbard, builder, Exeter; J. Smerdon, builder, Torquay; and H. P. Rabbich, builder, Paignton, spoke of the bad work of plaintiff in laying the floors and otherwise. Defendant counter-claimed £175 for damages due to plaintiff's alleged negligence. The arbitrator will make known his award in due course.

**PARLIAMENT-STREET IMPROVEMENTS.**—The first of a series of large claims arising out of the demolition of the block of buildings between Parliament-street and King-street, Westminster, came before Mr. Christopher Oakley, vice-president

of the Surveyors' Institution, at the Westminster Palace Hotel, on Monday. Mr. Bosanquet, Q.C., was legal assessor. Messrs. Dyson, Parliamentary agents, claimed £18,000 in consequence of having to remove from No. 24, Parliament-street to No. 9, Great George-street. Mr. Cripps, Q.C., M.P., and Mr. A. Lyttelton, M.P., appeared for the claimants; the solicitor-general, Sir Robert Finlay, Q.C., M.P., and Mr. Vaughan Williams represented H.M. Office of Works. Mr. Robert Vigers, Mr. Arthur Gerrard, and Mr. Daniel Watney, president of the Surveyors' Institution, gave evidence, and the case was adjourned.

## STAINED GLASS.

**BLACKBURN.**—A stained-glass window has this week been placed in the east end of the Audley Range Congregational Church, Blackburn, in memory of the late Mrs. Eli Heyworth. The window is in the Gothic style, and consists of seven principal lights, illustrative of the 31st chapter of Proverbs. At the top of the window is the dove of peace, with angels encircled as cherubs on either side. On the three lower traceries are Faith, Charity, and Hope, and then came the seven principal lights already referred to. The Gothic ornament below bears an appropriate text from Proverbs, and at the base is an inscription. The window is from the studio of Messrs. Heaton, Butler, and Bayne, of 14, Garrick-street, Covent Garden.

## PARLIAMENTARY NOTES.

**NEW WAR OFFICE BUILDINGS.**—Mr. Akers Douglas moved, on Thursday night in last week, the second reading of the Public Offices (Whitehall) Site Bill. He said its object was to acquire the Carrington House site for the purpose of the erection of a new War Office. The site was on the left-hand side of Whitehall approaching Parliament-street, and afforded sufficient building-space for more than the War Office at present required, but not more than might be necessary for extensions in a few years. The Bill was based on the unanimous report of the Select Committee which sat last year and considered the question of sites for public offices. The freehold of the site was vested in the Crown, but it would be necessary to purchase it from the Commissioners of Woods. That would make no difference from the taxpayer's point of view, because the revenue would be obtained, instead of from the Consolidated Fund, from the Land Revenues Account, which was administered by the Office of Works. As far as he knew, the Bill was approved on both sides of the House. The motion was carried by 158 votes to 23.

## CHIPS.

The Corporation of Brighton have resolved to spend £12,000 on the protection of the Madeira-road foreshore. The works will embrace the widening of the roadway from the site of the Chain Pier to Royal Crescent from 40ft. to 60ft., and the erection of two groynes with breastwork of timber.

The St. Helen's Corporation having applied to the Local Government Board for sanction to borrow £1,050 for sewerage purposes, £1,000 for an improvement of the corporation slaughter-house by the addition of a refrigerator, and £15,000 for paving of certain streets with granite sets, Colonel Coke, M.L.C.E., an inspector of the Local Government Board, held an inquiry into the matters in question at St. Helen's Town Hall on Tuesday.

Mr. W. G. Callen, of Belfast, has recently extended and improved the model building and joinery works of which he is the proprietor, and on Saturday afternoon a number of gentlemen interested in building and kindred operations were invited to the new works in Carrick-hill to inspect the buildings and machinery.

The members' soirée of the Architectural Association will take place at St. George's Hall, Langham-place, W., on Thursday, the 6th May, at 8 p.m. A musical play, entitled "The Bounds of Art," written by Mr. H. B. Creswell, with music composed by Mr. Leonard Butler, will be presented. Ladies will again be included in the cast.

The annual dinner of the Building Trades Association of Manchester, Salford, and District was held at the Albion Hotel on Thursday in last week. In the unavoidable absence of the president (Mr. Councillor Holland) the vice-president (Mr. Geo. Macfarlane) presided, and was supported by Messrs. R. Neill, jun., W. Southern, I. Wilson, C. H. Normanton, John Cantrill, and others. A deputation from the Lancashire Federation of Building Trade Employers was present, by invitation, to advocate the adhesion to that organisation of the several trades represented in the Manchester Federation. Mr. Cunliffe, of Bolton, the president, and Mr. John Tomlinson, of Preston, the secretary of the Federation, as leaders of the deputation, appealed to the members to support that body.

## Our Office Table.

A DUBLIN correspondent of the *Times* states that the Custom House in that capital, designed by Gandon in the year 1781, is threatened with injury. Its custodians, the Irish Board of Works, "propose to alter the appearance of the front facing the river by filling in the arches of the east arcade with sashes that bear a strong resemblance to clumsy shop-windows, and over these again to fix iron gratings, in which glass is also to be inserted. The change is to be made on the pretext of acquiring the corridor space for office accommodation. Yet though the corresponding arcade on the west or city side of the central entrance is to be left open as at present, and the steps which lead to both arcades are to remain untouched, the local authorities strangely assert that these alterations will not affect the architectural beauties of the building."

THE Sanitary Institute have accepted the invitation of the Leeds City Council to hold their autumn congress and exhibition in Leeds next September. The congress will last for a week. The programme includes general addresses and lectures; sectional meetings for the reading and discussion of papers relating to sanitary science, engineering, architecture, chemistry, meteorology, and geology; and conferences of medical officers, engineers, and sanitary inspectors. Visits are to be arranged during the congress to the waterworks, sewage-disposal works, the hospitals, and other places of interest to sanitarians. There will also be a health exhibition, containing all the newest forms of sanitary appliances and machinery relating to municipal and domestic sanitation.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "The New Government Offices Scheme," by H. H. Statham. 8 p.m.  
TUESDAY.—Architectural Association of Ireland, Dublin. 8 p.m.  
Institution of Civil Engineers. Discussion on "The Blackwall Tunnel." 8 p.m.

The Norwich and London Accident Insurance Association will remove into new offices at 13, Waterloo-place, Pall Mall (as their West-end offices), as soon as the necessary alterations, decorations, &c., are completed. The fittings are by Mr. B. E. Nightingale, of Albert Works, Lambeth, and the builder's work by Mr. H. S. Stephens, of 228, New North-road, under the superintendence of Mr. Alfred E. Nightingale, architect, 52, Queen Victoria-street, E.C.

By permission of the Very Rev. the Dean, the members of the Bristol Association of Clerks of Works and Builders' Foremen paid a visit to the Bristol Cathedral on Saturday afternoon. Mr. Hayward, who proved a very able guide, conducted the party through, and in a very instructive and interesting manner explained some of the most notable facts relating to the founder and benefactors of the monastery, and also of the different periods and diversity of style of architecture in the different parts of the cathedral. This is the first of a series of visits to be paid during the coming summer to the various places of historical and architectural interest in the neighbourhood.

The Wesleyan chapel at St. Ives, Cornwall, was re-opened on Thursday in last week, after being renovated at a cost of £2,000. The pillars which stood in the centre of the chapel have been removed, and an iron roof now spans the entire building. The body of the chapel has been re-floored, and pitch-pine seats have been fixed throughout. The gallery has also been re-seated with pews similar to those below, and the floors have been re-arranged. The heating, ventilation, lighting, and sanitary arrangements have all received attention, and the organ has also been renovated and refixed. Mr. O. Caldwell, F.R.I.B.A., of Penzance, was the architect, and Mr. W. J. Winn, of Helston, the contractor.

The death of Mr. Robert Ingham, J.P., took place on Tuesday at his residence, Greenhill House, Wortley, Leeds, aged 76 years. The deceased was the son of the late Mr. William Ingham, of Wortley. For many years he was senior partner in the firm of William Ingham and Sons, firebrick and sanitary-tube manufacturers. He held that position till the business became part of the Leeds Fireclay Company, Limited. For a considerable period Mr. Ingham filled the office of chairman of the Bramley Board of Guardians. In March, 1880, his name was placed on the Commission of the Peace for the city, and in October of the same year he was appointed a member of the Licensing Committee.



## Trade News.

### WAGES MOVEMENTS.

**BRIGHOUSE.**—The members of the Brighouse branch of the National Operative Stonemasons' Association ceased work on Thursday in last week in consequence of a notice, served on the masters four months ago, demanding an advance in wages and the establishment of a code of working rules, having expired. The advance asked for by the men is 3d. per hour, which is equivalent to 3s. per week of 49½ hours—from 32s. to 35s. Between fifty and sixty masons are affected by the strike.

**COVENTRY.**—The plumbers struck work on Wednesday week on the refusal of the master builders and plumbers to accept a code of new working by-laws. The standard rate of remuneration is said by the employers to be 7½d. an hour, though this is denied on behalf of the operatives, and the men asked for a minimum wage of 9½d. per hour—an increase of 2d. Concessions were also sought in regard to Saturday work, walking time, overtime, and country jobs, and it was desired that three months' notice should be given of any alteration of the proposed new rules. The plasterers' labourers have also struck on the masters' refusal to grant an advance from 5½d. to 6½d. per hour.

**EDINBURGH.**—A mass meeting of Edinburgh joiners was held in the Oddfellows' Hall, Forrest-road, on Friday, for the consideration of the wages question. Mr. William Gall occupied the chair, and the hall was crowded. The secretary read the reply of the masters to a communication addressed to them by the employees on 14th January last, requesting the alteration of Rule 1 by substituting 9d. per hour for 8½d. per hour—an increase of ½d.; this alteration to come into operation on April 15. A further request was that the old municipal boundaries should remain as under Rule 3. The reply from the masters, dated March 3, stated that it had been unanimously resolved not to accede to the request for the rate of 9d. per hour. The masters were also of opinion that the new municipal boundaries should in future be the recognised boundaries. The meeting unanimously resolved to abide by the decision arrived at on January 14, and decided to assemble again on Wednesday, the 14th inst., to hear the reply of the employers. —A meeting of the masons of Edinburgh and Leith was held in the Oddfellows' Hall, Forrest-road, Edinburgh, on Friday night, to consider the question of an eight-hours day. An attendance of fully 150 was presided over by Mr. McBeith. The motion for the adoption of the movement was made by Mr. Scott, who pointed out that a principal reason why the hewers should take action in the matter was the fact that the average duration of life among them during the last twelve or fourteen years was as low as 38 or 39 years. What they wanted was an hour less every day, or a 45 hours' week. In the event of the adoption of the movement, a good many more masons would be employed. The committee might approach the employers, and ask that the matter be submitted to them along with the working agreement. An amendment was moved by Mr. Mackenzie, to the effect that the committee do not approach the masters until a vote be taken of the whole operatives of Edinburgh and Leith by a plebiscite. On the vote being taken, the original motion was carried by a large majority. A rider to the effect that the question of the eight-hours day do not be coupled with the working rules for the year was defeated.

**HUDDERSFIELD.**—Wages are being advanced in several branches of the building trade at Huddersfield, in a quiet and unobtrusive way, which speaks volumes for the steady upward turn which business generally has taken. Six months ago the men employed by the master plasterers in a considerable area around Huddersfield gave notice of several demands in order to improve their position. These were met some time before the notice expired, and practically to the letter so far as wages are concerned, and a strike been thus averted.

**IPSWICH.**—The carpenters and painters have given notice to their employers that they expect an additional halfpenny an hour on and after May 1st. This advance is asked for in order to keep pace with the bricklayers.

**KIRKCALDY.**—The joiners, in pursuance of their dispute with the masters for an increase of wages, weekly pays, and a year's agreement, came out on strike on Thursday in last week. The advance asked was ½d. per hour. The masters took up the position that they would grant the advance conditionally on the Edinburgh men granting it. The Kirkcaldy joiners would have no condition. A meeting of the Masters' Association was held on Friday, when it was agreed to accede to the men's demand in full.

**OXFORD.**—The carpenters and joiners met last week to consider what steps should be taken to obtain better wages. Mr. G. Parsons presided, and stated that notice had been served on the masters for an advance from 7½d. to 8d. an hour. It was pointed

out that of the 300 workmen in the Oxford district, only about 120 belonged to the society, and it was impossible for them to do anything in this matter, unless supported by the non-unionists. The meeting broke up without coming to a decision on the matter, but workmen were urged to join the local branch of the society.

**THE PENRHYN SLATE QUARRIES.**—Notices were again posted on Friday evening at the Penrhyn quarries inviting applications for work, and stating that Lord Penrhyn was prepared to investigate, through a deputation, any complaints which might affect the workmen. At the same time, there must be freedom of labour and no attempt by any committee to interfere with the management. It is believed there will be no response to the offer, and that the strike must continue. The men have already lost £200,000 in wages, and much distress prevails.

Mr. Dennis Gill, head of the firm of Gill and Son, builders, Doncaster, died on the 1st inst. Deceased, who was 62 years of age, had been ailing for some time. He was formerly a partner in the firm of Athron and Gill, the partnership being dissolved when Mr. John Athron retired a few years ago.

The new Gladstone Liberal Club in Boothroyd-lane, Dewsbury, was opened last week by Mr. M. Oldroyd, M.P. The premises consist of a reading-room, lecture-room, bar and lavatories on the ground floor, and a large billiard-room on the second floor. The work has been done by Messrs. Thornton, of Dewsbury, and the buildings, with furnishings, have cost about £1,100.



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Wrought-Iron Girder Plates.....	5 15 0 "	7 10 0
Bar Iron, good Staffs.....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 10 0
Do., Welsh.....	5 15 0 "	5 17 6
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South Staffs.....	7 17 6 "	8 5 0
Best Snedshill.....	10 0 0 "	10 10 0

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Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	£11 0 0
Best ditto.....	11 5 0 "	11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0	£8 10 0
Cast-Iron Stanchions.....	8 0 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6
Cast-Iron Socket Pipes—		

3in. diameter.....	5 10 0	5 15 0
4in. to 6in.....	5 5 0	5 10 0
7in. to 24in. (all sizes).....	4 15 0	5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned  
and bored joints, 5s. per ton extra.]

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to 110s.	
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.	

Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

Gas-Tubes.....	75p.c. Fittings 77½p.c.
Water-Tubes.....	70 " 72½
Steam-Tubes.....	62½ " 65
Galvanised Gas-Tubes.....	60 " 62½
Galvanised Water-Tubes.....	55 " 57½
Galvanised Steam-Tubes.....	45 " 47½

10cwt. casks. 5cwt. casks.

	Per ton.	Per ton.
Sheet Zinc, for roofing and work- ing up.....	£23 0 0	£24 0 0

Sheet Lead, 3lb. per sq. ft. super.....	13 5 0	14 17 6
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Pig Lead, in 1cwt. pigs.....	13 0 0	14 15 0
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Lead Shot, in 25lb. bags.....	16 0 0	17 0 0
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Copper Sheets, sheathing and rods.....	63 0 0	64 10 0
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Copper, British Cake and Ingot.....	53 0 0	60 15 0
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Tin, Straits.....	60 5 0	60 15 0
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Do., English Ingots.....	64 10 0	65 0 0
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Spelter, Silesian.....	17 15 0	18 5 0
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	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£3 15 0	9 15 0

Cut Floor Brads.....	8 10 0	9 10 0
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Wire Nails (Points de Paris).....		
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0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
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8/6 9/0 9/6 10/3 11/0 12/0 13/6 14/9 16/9		per cwt.
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### TIMBER.

Teak, Burmah.....	per load £13 10 0 to £16 10 0
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" Bangkok.....	" " 11 10 0 " 15 0 0
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Quebec pine, pitch.....	" " 2 0 0 " 4 0 0
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" Oak.....	" " 5 0 0 " 6 0 0
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" Birch.....	" " 3 10 0 " 5 5 0
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" Elm.....	" " 3 15 0 " 5 0 0
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" Ash.....	" " 3 0 0 " 4 5 0
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Dantsic and Memel Oak.....	" " 2 10 0 " 3 10 0
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Fir.....	" " 2 15 0 " 4 15 0
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Wainscot, Riga p. log.....	" " 2 5 0 " 4 10 0
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Lath, Dantsic, p.i.....	" " 4 10 0 " 5 10 0
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St. Petersburg.....	" " 5 0 0 " 6 10 0
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Greenheart.....	" " 8 0 0 " 9 0 0
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Sequoia, U.S.A. ..per cube foot	£0 1 11 to £0 2 0
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Mahogany, Cuba, per super foot	
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1in. thick.....	0 0 4½ " 0 0 6
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" Honduras.....	" " 0 0 5 " 0 0 6½
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" Mexican.....	" " 0 0 1 " 0 0 5
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Cedar, Cuba.....	" " 0 0 4½ " 0 0 5
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" Honduras.....	" " 0 0 4 " 0 0 5
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Satinwood.....	" " 0 0 7 " 0 1 0
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Walnut, Italian.....	" " 0 0 3½ " 0 0 7
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Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in.....	
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Quebec, Pine, 1st.....	£20 0 0 to £23 0 0
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" 2nd.....	14 10 0 " 16 10 0
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" 3rd.....	7 0 0 " 10 10 0
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Canada Spruce, 1st.....	9 10 0 " 11 0 0
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" 2nd and 3rd.....	7 15 0 " 9 0 0
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New Brunswick.....	7 10 0 " 8 5 0
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Riga.....	7 10 0 " 8 19 0
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St. Petersburg.....	9 10 0 " 13 10 0
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Swedish.....	9 0 0 " 16 10 0
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Finland.....	9 0 0 " 9 10 0
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White Sea.....	10 10 0 " 17 0 0
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Battens, all sorts.....	5 0 0 " 20 0 0
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Flooring Boards, per square of 1in.:	
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1st prepared.....	0 9 0 " 0 16 0
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2nd ditto.....	0 7 6 " 0 12 6
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Other qualities.....	0 5 9 " 0 7 0
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Staves, per standard M:—	
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Quebec pipe.....	35 0 0 " 42 10 0
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U.S. ditto.....	230 0 0 " 240 0 0
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Memel, cr. pipe.....	200 0 0 " 210 0 0
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Memel, brack.....	200 0 0 " 210 0 0
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### OILS.

Linseed.....	per ton £14 0 0 to £15 0 0
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Rapeseed, English pale.....	" " 25 5 0 " 26 0 0
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Do., brown.....	" " 23 10 0 " 26 15 0
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Cottonseed ref.....	" " 14 17 6 " 15 7 6
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Olive, Spanish.....	" " 29 10 0 " 30 0 0
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Seal, pale.....	" " 23 15 0 " 24 0 0
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Cocanut, Cochín.....	" " 27 10 0 " 27 15 0
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Do., Ceylon.....	" " 23 10 0 " 23 10 0
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Palm, Lagos.....	" " 22 9 0 " 23 10 0
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Oleine.....	" " 13 0 0 " 20 0 0
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Lubricating U.S.....	per gal. 0 6 3 " 0 7 6
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Do., black.....	" " 0 4 9 " 0 6 6
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Tar, Stockholm.....	per barrel 1 2 0 " 1 5 0
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Archangel.....	" " 0 12 6 " 0 15 0
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Turpentine, American.....	per ton 21 0 0 " 21 10 0
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## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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## MODERN PHILISTINISM.

OF all professional men the architect is the only one whose opinions and judgments are not accepted with deference or authority. Why it should be so it is perhaps difficult to say, except that his opinions deal largely with questions not of absolute fact or certainty, but of evidence of a more or less conflicting kind, and with matters of taste. People are apt to measure the opinions and judgments of others by their own standard. Undisciplined and uncultured as many persons are on questions relating to building and art, they are yet prone to imagine that all matters of this kind are very much of the nature of guesses, and have no basis or principle to rest upon. Even in a question relating to workmanship, performance of contract, a certificate on completion of work, a client often intrudes his opinion, or disputes his architect's decision with an arbitrary hauteur that is almost ridiculous. Persons not in the habit of deciding nice questions depending on evidence or on matters of experience, often rush to a conclusion, or express an opinion very wide of the mark about almost anything. The old maxim, "Fools rush in where angels fear to tread," is particularly true of that large class of people who form building committees and employers of architects. To very few is given the faculty for discriminating between true and false, the beautiful or tasteless; and as "taste" is the sense of discrimination, those who cannot distinguish between qualities and things must be devoid of taste. Yet they are just the persons who are sure to hazard an opinion where they can do so without committing themselves to ridicule. In all art matters they imagine they have their opportunity and can exercise their prerogative. But with what consequences to the poor architect!

One of the greatest difficulties the modern professor of architecture has to contend against is that of convincing a client or a committee that he or they are wrong, or are not competent to form an opinion on any question of arrangement or design. How is he to be so impolite as to tell them plainly they know nothing about the matter, or even to hint that their taste is wrong? Such an intimation would amount to an insult to a man who believed that "taste" was only another name for individual fancy or caprice; to one who knew that there was such a thing as a standard of beauty, or certain laws upon which good design rested, the correction or the opinion of the architect would come with less irritation, and he would be inclined to admit his architect was right after all. In fact, it is precisely in proportion to the utter incompetence of the person that the architect's design or opinion is undervalued or disputed. People who use the often-repeated phrase, "It is only a matter of taste," are they of whom the professional artist has most to be aware, for they are just the people who think their own opinion and judgment as good as any other in such matters. There is a vagueness which stands for definite correct teaching, not only in politics, theology, church history, and the like; but in architecture amongst them. Mr. Brown or Mr. Smith is satisfied with what he has picked up about these questions from early school books, visits to picture galleries, and the like, and never troubles himself to examine into the grounds of his beliefs, or his supposed facts. They have been sufficient for his fathers, and they are enough for

him, and this is the way more than half the world thinks and acts. The architect amongst other professional men has to bear the brunt of this prejudice and ignorance whenever any of them have to deal with the proverbial Mr. and Mrs. Grundy, who know all about everything, and are determined at every turn to thrust their own taste forward. What can be more vexatious to the architect who has made a design in which he has exercised his skill and taste to be told that he must take out this feature, or alter that, to make it agree with a very commonplace, or, perhaps, tawdry, design of some builder? We can well imagine the local Mr. Smith wishing his architect to introduce into the design for his stable or cottage ornamental timber framed work, or cut ornamental bargeboards when the hapless designer has been trying all the while to avoid extraneous features, and to be as simple and broad in treatment as the materials and cost suggest. In vain he argues the question that, as brick is the local material, it is better to avoid imitations which are not real and constructional, or that effect is better gained by simple methods, that the introduction of ornamental timber framing is unnecessary and expensive. The architect strives to put his principles into practice; but his tasteless client will insist that his views are carried out. There is no appeal. It is either yielding or offending. The medical practitioner can say, "If you do not adopt the course I prescribe I will not guarantee your cure"; the lawyer can plead the inexorable fiat of the law; but the architect can hold out no such threat for non-compliance. He must forego his own taste or decline to carry out his client's wishes, which may be only caprice. Many times he has to wage a perpetual war to maintain his ground; more often the client scores a succession of little victories, the result of which is to rob the design of all its character and merit. As may be imagined, this conflict of opposite taste is most disheartening to a conscientious designer, whose every line and detail are the result of thought and intuition, who places his window here and arranges his blank wall there, or introduces framed work only with a definite object in view, and not as a mere whim. All this is very hard to bear. He can endure little changes of plan which do not affect the general scheme; but when the client asks for alterations of design, or introduction of features that are meaningless, it is time to protest. One case came to our knowledge some time ago. An architect prepared designs for a country villa, in which the windows were mullioned casements, as agreeing with the style; but his client would have them all substituted by ordinary sash windows with large sheets of glass. Vainly the architect remonstrated that the change would entirely spoil the character of the design. The architect's taste was here repudiated. The question occurs, Why employ an architect if his advice and ideas are so heedlessly ignored? We know also of employers who will have half-timbered work. What is the result? The architect finds it impossible to introduce the real thing, and a compromise is made, which means that the "timber" studding is a mere superficial imitation of boards, and we have, in fact, the "bogus half-timbered house" which a well-known architect declaimed against as artistic dishonesty. The modern client of Philistine views generally likes something "showy" or ornamental, and is a sort of person particularly obnoxious to the man of art. That sort of superficial respectability, which goes down with the uncultivated, is one of the hardest things for the architect to overcome. It has been said, "It is impossible to be religious in the Army"; barrack-room combination and comradeship is destructive to such a spirit. Is it not quite as true that we cannot instil the atmosphere of art amongst

the Philistines of the day? They will have something they have been accustomed to see; the showy house and appointments are with such persons the chief object. Why should the architect more than the painter, the sculptor, or the musician be subjected to these arbitrary dicta of the employer? Why, indeed? Does not the architect undertake a more responsible duty than either of his brother artists? Why should a man have more reason to interfere in the plan of a building or an elevation than he has in the painting of a picture or a portrait? Imagine a painter altering his composition or rearranging his colour scheme in obedience to the whim of his patron!

One reason why the ordinary employer prefers to have his own way and exercise his taste in building matters is accounted for by the want of interest the public take in architecture. It is unpopular, the average man and woman know very little of the subject, and their taste must always be much lower than that of the architect. They cannot see things in the same way because they are on different levels or planes. What is beautiful and "artistic" to one is supremely ugly and tasteless to the other. In matters of furniture or decoration—the question of good or bad both in form or colour—it is quite impossible for Mr. or Mrs. Jones to accept the taste of their architect; quite impracticable that they should agree as to the design of a firegrate or a wall-paper. And if this be so in matters of decoration, it is not difficult to understand how impossible it is for them to admire a piece of architectural design in which constructive fitness and other abstract ideas are involved. It is just as impossible for them to appreciate it as to imagine a reader of a trashy novel could seriously enjoy the pages of Walter Scott, George Eliot, or other writer whose descriptive or logical powers were of so much higher a standard.

It is not by coming down to the popular level, but by endeavouring to raise the standard of taste, that the hope of architecture is to be found. An architect who is so indifferent as to what concerns his art as to complacently fall in with his client's ideas when all the time he knows he is wrong is unworthy of his calling, and is hopelessly giving himself away. Perhaps it is a plan that is altered or spoiled, by acceding to the owner's views without a protest; or it may be a too-ready compliance with the taste of his wife in a matter of design, as if it did not matter a straw what style or kind of feature is introduced. There are too many practitioners of this kind. They make elevations and perspectives "to order" in any style, like a costumier, and their ideas of accommodating their designs to the varying whims of people are unscrupulously elastic, and serve to make the profession a sort of mechanical trade. Of course, the principle of compromise may be carried too far. It may be reasonable for an architect to consult his client's wishes about plan, or his taste in a general manner; but to commit himself to carry out all his views, promising to supply his wants just as a tailor would do, is to lower the status of the profession in the eyes of the public. What is an architect employed for but to contribute skill and taste in the design of buildings? But really there are many in the profession who are bringing the art down to the level of draughtsmanship, or a business to carry out buildings to an employer's own liking. The compromising spirit is partly owing to the want of that status which other professions enjoy. It proceeds from a loss of independence, which the doctor and lawyer possess as the administrators of sciences founded on fact and experience; but it proceeds also from that uncertain and hesitating mind about questions of art and taste, which appear to most people to be matters more of opinion than anything else. Let those who practise an art founded on



science and experience, as well as upon taste, do the best to overcome this acknowledged difficulty in architectural practice. Popular tastes and prejudices vary, and have to be boldly encountered; and if the architect desires to do his duty unflinchingly, he must be content to be unpopular, to accept unpopularity as a lesser evil than apostasy to art.

### THE MASTER CRAFTSMAN'S IDEAL OF ARCHITECTURE.

**A**RATHER uncomfortable feeling must have stolen over a large number of those who listened to the thoughtful paper read by Mr. T. G. Jackson, R.A., at the Architectural Association the other day, when he tried to realise to his audience what the practice of architecture used to be in its palmiest days, and what it ought to be now according to many of the leading lights of the art who have taken the anti-professional view of architecture. We suspect the realisation of the Greek or Middle Age system—that which Pythias contended for: the system which makes an architect skilled in the practice of all the arts and crafts—was rather too much for the nerves of many of the students and followers of modern professionalism, especially of those who take the lucrative commercial view, and who practise architecture as a respectable mode of undertaking a variety of other businesses; surveying, estate agency, and quantity taking. We can hardly expect men who live by percentages and commissions derived from duties which have no connection with architecture, and who, like other professional men, prefer to dwell in comparative ease away from daily toil and grind of work, can view with favour this doctrine. Lucrative architecture nowadays is a very different sort of occupation to that which the architects of our great Mediæval and Renaissance buildings knew. All is pleasantly ordered in a prim set of offices in some respectable street or square; the "ghost" or the assistant does all that there is of art; the "quantity surveyor" makes everything on the new building square, or may even write the specification; the "professional" architect has simply to see clients, discuss matters which are carried out by some one else, receive tenders, and to give general directions to his clerk of works. His occupation, in a word, is more as a general adviser or consulting agent, engaged in interviews, granting certificates, and adjusting business relations. Instead of setting out buildings, superintending masons, carpenters, and other workmen, making rough, full-size details on the actual building, and himself performing sundry operations, as master builder, his task is before a drawing-board, his tools the compass and the tee-square, and his companions artful pupils or assistants. Instead of being on the actual building, he is perhaps 100 miles away, and directs his resident clerk through the post. Imagine, we say, a modern architect exchanging his mode of life and office labour for this kind of superintendent of work. It seems impossible. And yet there are reasons why it would be a decided advantage, if the modern architect took a closer interest in the actual building, if he could not only design the work on paper, but see it carried into execution, and would, in fact, unite the duties of a supervisor with those of a clerk of works. Mr. Jackson very truly remarks a man cannot be expected to produce good designs who seldom or never comes into contact with the materials out of which his designs have to be constructed. Suggestions in design more often arise by handling the actual material, or in trying to convert it to a given purpose, than by reading books and attending classes. And there can be no doubt that "an hour spent in the workshop or on the scaffolding will often teach the student more

than a week spent in a library." Everyone who has made working drawings of stonework knows how difficult it is sometimes to understand the actual way a stone should be cut for a given position in which there are several conditions to comply with. On the building he sees exactly the problem or the proper shape the stonework ought to assume. In carpenter and joiner's work the difficulties of making practical details are quite as great. In setting-out or converting the timber, one sees a way of doing the work which can hardly occur to the draughtsman in the office removed from actual contact with the building. And here we have the value of an architect on or near the work. No wonder the bishops and chapters of the old days bound the architect to an intimate association with his work. He and his family were required to live in the locality close to the building, and to devote his time and attention solely to the work; there were no opportunities for him to engage in other works, for he was required to be a practical mason or some other craftsman, and to spend a specified time per day on the building. As we read the by no means exaggerated account given by Mr. Jackson as to the mode adopted in the days of Henry VI. or Lorenzo de Medici, we can understand the care and patience bestowed on the details of old buildings, we admire and copy so much. The architect did not spend his time on high stools amidst dusty rolls of paper; he had no working drawings to make, no visits from a variety of clients, no arrears of correspondence to get through before post time, no long railway journeys on which more than half the time is wasted, no specification or agreements, but all his time was spent in the actual superintendence of men engaged by himself. This isolated attention was not without its advantages; there were none of those disturbing influences and interruptions, calls, and other duties which now distract the busy architect's mind and disillusion him for the artist's work. He could give his mind entirely to his art, undisturbed by questions of quantities, costs, and other commercial duties. It is quite impossible for the busy London architect to devote his thought and study to several buildings at the same time. Here we have one of the momentous questions which are suggested by the subject. Is it not better that the architect should confine his attention to one building at a time and see it carried through from its inception to its completion, than that he should be occupied with a number of buildings, and delegate his duties to clerks? No doubt the modern professional will find an apology; he will probably say that the modern architect, by confining his attention to design and general supervision, can control with more efficiency the actual operations of building than if he had to assist on the work, and that in this way he can just as well direct a dozen buildings as he can one. This is the modern way of looking at all trades and professions, and is in accordance with the principle of division of labour; but we have yet to learn that art has benefited by it. From a practical point of view, the old Greek and Mediæval system works well. The architect can try his experimental study on the building before he decides upon it. When anything looks wrong he can at once stop the work and substitute some detail or thought that is better, without any trouble about "extras" or breaking the contract.

Coming to the question whether such a system can be again brought back, we must admit with the reader of the paper that it is very doubtful. Modern conventions and habits cannot easily be broken through. The practice of preparing sets of drawings full and complete has taken a deep root; people like to see what they are going to pay for before committing themselves to bricks and mortar. Then, as Mr. Jackson

pointed out, in even the days of the Italian Revival, working drawings were very slight, and, in fact, often mere diagrams. The schools and guilds of masons and other craftsmen insured a body of workmen who could be fully intrusted with the architect's rough drawings. They could fill in details themselves according to the architect's intention; but now all this is changed. Working masons and joiners could not now be relied upon to carry out the details or the ornament; they have not the artistic training. Drawings are, therefore, necessary, and must be supplied; but we certainly may do more to bring ourselves in touch with the real work. If we do not actually become amateur handicraftsmen, and learn how to excavate and build walls, cut stone, frame doors, and the like, with our own hands—and some of these trades, as Mr. Jackson said, do not help to improve our ideas of design—the young architect may, at all events, learn the practical operations of the workshop, the way the tools are handled, the materials converted. He ought at least to be able to model the clay so as to show roughly how a capital or a piece of stone carving is to be done to meet his approval. The value of knowing how the trades are executed is that it gives confidence to the designer, and enables him to be sure that his detail can be carried into execution without any doubt in his own mind as to its practicability. Surely this standard of architectural proficiency ought not to be beyond the powers of anyone who aspires to be something higher than a mere agent for carrying out architectural work.

### THE NEW GOVERNMENT OFFICES.

**A**T the fortnightly meeting of the Royal Institute of British Architects, held on Monday evening, the President, Professor George Aitchison, A.R.A., in the chair, a paper on "The New Government Offices" was read by Mr. H. H. STATHAM, F.R.I.B.A. The lecturer treated his subject from an architectural point of view, both in regard to the most effective treatment of the buildings themselves, as an important element in our national architecture, and to those questions of alignments of streets which came under the head of "public improvements." It was obviously important both for architectural effect and convenience of communication that the Government offices should be concentrated, and should be rebuilt from time to time in accordance with a definite scheme to which each new building would be a contribution. Such a scheme, on the grandest scale, had been drawn out by Sir Charles Barry in 1857, not only for the concentration of the Government offices, but for the improved laying-out of the whole Westminster and Whitehall district. The greater part of that scheme was now rendered impossible by what had been done in a piecemeal way since; but one or two points in it were still capable of realisation. In 1856 took place the great competition open to the world, for a plan for the concentration of the Government Offices, and for separate and special designs for War Office and Foreign Office buildings, as the result of which the War Office was abandoned, and Sir Gilbert Scott, who obtained the second premiums in both competitions, received the commission for the Foreign Office. It had been attempted to show that the Foreign Office was a complete failure, and a proof of the mistake of erecting palatial Government offices designed by an outside architect; but this was exaggeration; the faults which it had could easily be avoided in a future case; it was at all events a dignified building, and its quadrangle, of the dimensions of 240ft. by 170ft., was on such a scale as to have a really fine effect. The argument that such buildings would be better produced by the official surveyors of the Office of Works was sufficiently answered by the buildings which were so produced, notably the post-offices, which were nearly all in a poor and commonplace style of architecture. In 1882 the competition for new War and Admiralty Offices was announced, not on the Great George-street site, as had been expected, but on a site near Spring Gardens, in which a part of the new building was relegated to the rear



of the houses. The opportunity afforded for widening the upper end of Whitehall by throwing back the west line of the street was entirely ignored. The next step was that this scheme was abandoned, the building of the War Office was again postponed, and the committee of 1887 reported that the Admiralty could be economically provided for by retaining and adding to the old Admiralty buildings. Nothing short of entirely gutting the old Admiralty could enable it to be made a satisfactory building, and the architectural exterior was not worth that. The new buildings, though well planned, represented a design originally commonplace, though rich and costly, cut down to a cheap brick structure with stone dressings; the superficial richness being removed, only the commonplace remained. As a building for the administration of the greatest naval Power in the world, it was little short of a disgrace to the nation. Coming to the Parliament-street site, the new proposed buildings there would be well situated parallel with the Foreign Office, but in order to produce their proper effect the design ought to range in its main lines with that of the Foreign Office, and harmonise with it in character; to erect an inferior type of building would be to destroy the whole architectural effect. The alternative proposal to set back the Parliament-street part of the new buildings at an oblique angle, merely with the object of getting a full view of Westminster Abbey from a point 80 yards higher up Parliament-street, was absurd; it would be spoiling the whole building and throwing away part of a site, already too small, for an almost imaginary benefit. Coming to the question of the War Office, the fact that the money had been voted for the Carrington House site surely did not bind the Government either to build War Offices and no other on that site, or to decline enlarging the site by the purchase of further property. It would be quite possible still to build the War Offices on the Downing-street site, and to provide for the departments now on that site on the Carrington House site. This would realise, with some modification, Barry's fine conception of the War Office and the Admiralty Office as symmetrical blocks on either side of the parade ground, the Horse Guards occupying the centre. Probably none of the buildings on the Downing-street site could be permanently retained in such a case—the interior of the Treasury building even was too old-fashioned to retain; but the little domed vestibule of Dover House ought to be respected in any case, and could easily be worked into a new building. The vote for the Carrington House site had been unexpectedly taken, and no architectural evidence at all had been heard on the scheme. The official plan for the building on this site was a double mistake. In the first place, the shape of the building was to be settled by the irregular shape of the intersecting streets. In the next place, the site would be overbuilt both for architectural effect and sanitary conditions; the largest quadrangle, into which rooms would look, was only 105ft. by 100ft. for a building five stories high. They might compare that with the quadrangle of the Foreign Office, the same height, and 240ft. by 170ft. There was nothing to prevent the Government acquiring some further property north of Whitehall-place, and treating that portion of the building in symmetrical architectural relation with the courtyard of the old Admiralty, if that was to be retained. There was no objection to building up Whitehall-place, as it was an unnecessary street as far as traffic connection was concerned. The rest of the building could be planned symmetrically on the greater portion of the Carrington House site, the building line on the south side being brought in a little so as to make Horse Guards-avenue central with the Horse Guards. The lecturer proceeded to sketch out what he termed a really stately scheme for the combined treatment of the Admiralty and War Office. Let them suppose the old Admiralty removed; the new block already built might be lengthened outwards a little, and returned towards Whitehall, with a similar northern block built on the foundations now being laid. On the centre of the fourth side of the quadrangle thus formed, facing Whitehall, would be the First Lord's House, with a columned screen and entrance on each side of it. Opposite to this, all the east side of Whitehall should be bought up to Craig's-court, and the War Office planned with a similar, but shallower, courtyard facing the quadrangle of the Admiralty, and the Com-

mander-in-Chief's house or staff offices in the centre, facing the First Lord's House. The new block of the Admiralty would be retained in its interior plan, but faced with stone, to form part of a superior architectural design. The whole west side of Whitehall up to Charing Cross would be set back on a new line to give it an equal width all the way up, and above all to connect it with the axial line of Trafalgar-square, the Charles I. statue being moved a few feet to get it also on the point of meeting of the axis of Whitehall and the Square. The Mall would be continued through in a straight line into Charing Cross, the space between that and the Admiralty being occupied by buildings forming the offices of the Woods and Forests and other small departments. He had spoken plainly on the matter of the buildings, because it was a subject of national importance. Architecture was not everything, but the effort to produce great buildings was coincident with the greatness and ambition of a nation in other respects; it was when a people was going down hill that national architecture was neglected. The Government had one chance yet left to do something fine with a War Office, something to atone for the long series of blunders with public buildings in this country, in regard to which one might say, "They have made us a by-word among the people, a very scorn and derision to them that are round about us."

Mr. H. W. BREWER, in proposing a vote of thanks to the lecturer, said he found the prevailing opinion among Englishmen at the present time and for many years past had been that it was not worth while to provide public buildings commensurate with the importance and prosperity of the country. A niggardly policy of repairing and extending old buildings led to the destruction in 1834 of the old Houses of Parliament, and the alarm and sense of loss thus occasioned evoked for a time the display of a more liberal spirit. He thought the interesting board-room at the old Admiralty Offices ought to be retained in any scheme for their reconstruction.

Mr. WILLIAM WOODWARD, in seconding the vote of thanks, referred to the paper he read in that room some 12 years since on a somewhat similar subject. He considered Mr. Statham had been very hard on, and, indeed, distinctly unfair to, H.M. Office of Works. The plans which had been referred to were, the lecturer was well aware, prepared most rapidly to be produced before the Sites Committee when sitting last year; as Mr. John Taylor said at the time, they were merely sketch ideas. They related to the areas available only, and although Mr. Statham had had constructed a model on this block plan, showing buildings carried to a uniform height of five stories, and had criticised the ill-lighted courtyard that would result from such an arrangement, he could positively assert that not one single elevation or section of such buildings had ever been sketched, and there was not one tittle of evidence as to the proposed height to which the buildings would be carried. It was, therefore, full early to complain of the elevations. But before they indulged in wholesale denunciation of official architecture, he would ask the members to compare the buildings erected under the supervision of H.M. Office of Works and three edifices gained in competition by outside architects—viz., the Foreign Office, the Law Courts, and the Admiralty Buildings. He thought much of the criticisms of the lecturer fell to the ground. As to the preference shown by Mr. Statham for bridges to subways, the problem of gaining easy access to the higher floors of buildings was simplified nowadays by the general use of lifts. He should like Mr. Statham to name the members of that Institute whom he regarded as capable of instructing the officials of the Board of Works; he maintained that they were experienced men quite capable of designing the buildings required for Government use. The lecturer had pleaded for the retention of Dover House, and the plea evoked the enthusiasm of members of the Institute, as well it might, for a more wretched building did not exist. How any man could wish to keep this structure he could not understand. Then, passing from the lecturer's diatribes against Government officials, they came to the practical part of the subject, and Mr. Statham put forward an amended suggestion of his own, but he asked, Could they imagine anything more horrible in its effect than the room which projected as an excrescence into Parliament-square on the lecturer's ideal conception for the treatment of the site? In his scheme, Mr. Statham gave them a very magnificent

project, quite regardless of the enormous outlay that would be involved; but it was a scheme that had as much chance of being adopted as the speaker had of being appointed Prime Minister. The whole scheme was wasteful and extravagant, but there was a want of broad effect, and the architectural treatment of the two small blocks of official buildings would be very difficult. It was curious to note that the lecturer proposed to widen Craig's-court, but left it after all as a *cul de sac*. The speaker regretted that a paper on so important a subject should have been tinged with feelings and prejudices that had no reference whatever to the topic. The best solution of the problem would, he thought, be to intrust the planning of the new buildings and their sites to the Office of Works, and to throw open their architectural treatment to the profession.

Mr. E. W. MOUNTFORD thought the Mall should be carried through to the Strand its full width, and that the outlet should be turned further north than was proposed. It was most desirable to remove Drummond's Bank and widen the entrance to Whitehall at that point. Mr. Woodward, in his criticisms on Mr. Statham's scheme, had taken the ordinary ratepayer's point of view. He feared Mr. Statham's was a grander idea than they were likely to see carried out. He agreed with Mr. Statham as to the extremely bad effect that would be produced by cutting back the new buildings on the west side of widened Parliament-street merely to show the Abbey. The best plan would be to keep the blocks of building rectangular, and make small gardens in front. It was hard to judge of the full effect of Scott's design for the Foreign Office, since the flanking towers had never been built. Again, the Government employed the greatest Gothic architect of his day, and compelled him to carry out an Italian design. However they might complain of Street's Law Courts, the group of buildings was a grand one, and its faults were largely due to Ayrton, and to the fact that Street was not allowed sufficient space for his buildings. He agreed with the lecturer in his plea for a more liberal and less utilitarian view of the provision of public buildings.

Mr. W. D. CAROE, F.S.A., pointed out that, as mutilated, the executed Admiralty Offices had cost more than Messrs. Leeming and Leeming's original design would have done, although he could not say that he appreciated that scheme. Possibly the best treatment for the improvement of the Admiralty Offices would be to build a narrow frontage, and fill up the entrance to the central courtyard. He trusted that no attempt would be made to transmogrify the old Admiralty buildings in accordance with the new block. Any attempt to build lofty piles of buildings on either side of the old Horse Guards would greatly injure the effect of that fine building, and, like the last speaker, he disapproved of Mr. Statham's suggestion of a projecting block into Parliament-square.

Mr. E. W. HUDSON deprecated the proposal to close and build over Whitehall-place.

Mr. JOHN BURNS, M.P., said he was a member of the Select Committee on the Sites of Government Offices last session, and that now sitting, but he judged this question as a citizen of London. It was not the intention of the committee to exclude outside architects from giving evidence on this matter. He would suggest that what that Institute ought to do would be to appoint a committee to formulate the views of the general body of architects upon the general rearrangement of the space between the National Gallery and the Houses of Parliament and as to the best means of utilising it; and, having done this, they should elect two of their members to give evidence before the committee. They would be heard attentively, and he might remind members that lately the Government had voluntarily met the requirements of the Building Act in their new post offices and other buildings although technically exempt from its provisions. He was not in favour of either Mr. Statham's or the Office of Works proposals, and should like to see an open competition of architects on the utilisation of the site. He would remind the lecturer that the select committee was only one dealing with sites, and not with buildings; and he might add that the committee could not be so much influenced as Mr. Statham imagined in the decision on the opening out of the Mall by the evidence of a superintendent of police. He held that there should be a fine sweep of offices from Charing Cross to King-street; he would remove 10, Downing-street,



notwithstanding its historical associations, and so open out views to St. James's Park, he would locate the new War Office on the site of Dover House, and the Treasury should be removed to the site of Carrington House. He believed that it was not yet too late for the Government to acquire the whole of Great George-street. He did not attach so much importance himself as some seemed to do to the £50,000 or £100,000 which these improvements would cost, so long as they were worth the outlay; he would be liberal and even generous in the ultimate interests of the country, for it was not creditable that the Government Offices should either resemble rat-holes or rabbit warrens, and if the buildings had been unsatisfactory in the past, it was because architects had not had the courage to press their views.

The PRESIDENT, in summing up the discussion, remarked that unfortunately neither the public nor politicians had the high view of the importance of architecture that prevailed in the small republics of Italy during the Middle Ages; but there were signs of an improvement in this respect, and he was hopeful of the future of public architecture.

Mr. STATHAM replied, defending his model, which he said was founded on the published block plan prepared by the Office of Works. It was impossible that such a plan could have been evolved without considering the elevations that were to be erected upon it, and as a matter of fact he understood it was proposed that, with the exception of the buildings next the Foreign Office, which would be four floors high, all the offices should be five stories in height. This scheme was not a finished idea, but merely a suggestion. He had often observed that Mr. Burns was on the side of æsthetic taste. He had expected to be called before the Sites Select Committee, but had been surprised to see that they had made an interim report. However, he was still prepared to give evidence unless they wished to call some more important architect. (A voice: "Hear, hear!") and laughter.)

Mr. BURNS explained that a Select Committee died with the session and thereupon reported at its close, but he would see that this session Mr. Statham was not overlooked.

#### THE WIDTH OF STREETS AND PASSAGES IN LIVERPOOL.

A LOCAL GOVERNMENT BOARD inquiry was held at the Town-hall, Liverpool, on Friday, before Mr. E. P. Burd, as to the application by the Liverpool Corporation for power to modify their building regulations so that new streets shall have a minimum width of 36ft. and back passages a minimum width of 9ft. Mr. W. Pierce, assistant town clerk, appeared in support of the application, and Mr. A. G. Steele for about seventy property owners who opposed the proposed increase in the width of passages. Mr. Pierce, in stating the case for the Corporation, said the existing by-laws, framed under the Liverpool Sanitary Amendment Act of 1846, required all new streets to be of not less width than 30ft., and back passages of not less than 3ft., except when exceeding 100 yards in length. In the latter case the minimum width must be 4ft. In 1895, when the boundaries of the city were extended, it was found that in the districts of West Derby and Wavertree the by-laws in force required a width of 36ft. for streets and 9ft. for back passages; and similarly in Toxteth and Walton the least width of streets allowed was 36ft., although there was no regulation as to passages. What was now proposed was to apply to the whole of the extended city the regulations as to streets and passages in force in Wavertree and West Derby. In those districts these regulations had not involved hardship. The Liverpool Land and House Owners' Association, the Liverpool Architectural Society, the Liverpool Master Builders' Association, and the North Liverpool, Bootle, &c., Property Association held in June last a joint conference to consider these and other proposals of the Corporation. Certain proposals of a contentious nature were taken exception to by these associations, and the Corporation had decided not to proceed with them. As regarded the width of streets, however, the conference approved of the minimum of 36ft., provided the regulation applied only to new streets and not to the rebuilding of old ones. As to back passages, the same meeting agreed to the 9ft. width, provided



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the Corporation would adopt and maintain such passages in repair. These suggestions the Corporation agreed to, but the Local Government Board was of opinion that the adoption of the passages was a matter of arrangement between the Corporation and property owners. He was authorised to say that the Corporation would take over and maintain these back passages if constructed to their satisfaction. Mr. Boulnois, city engineer, stated that 9ft. back passages were desirable as facilitating scavenging, and as promoting public health. In reply to Mr. Steele, he said that he was not aware that these back streets became regular fowl runs, were left in a dirty state, and blocked at night by hawkers' carts. Mr. Steele produced plans with a view to show that the new regulation would bring the backs of houses 5ft. nearer, since the eaves of each row of houses were at an angle of 45° from the foot of the backyard wall of the opposite row. It was, however, pointed out by Mr. Pierce that the amount of yard space, 150sq.ft., was not to be minimised. Mr. R. S. Reynolds, veterinary superintendent, was called to show that the new regulation would do away with the necessity for tipping ashpit refuse in the streets before taking it away. Dr. Hope, medical officer of health, strongly urged the value of wider back passages on the ground of health. Mr. G. Norton, president of the House and Land Owners' Association, stated that the property owners approved of the regulation, provided the Corporation would relieve them of the obligation to keep these passages in repair. Mr. Pierce said there was a resolution of the council agreeing to the arrangement. Evidence was then called by Mr. Steele in opposition to the Corporation. Mr. T. T. Wainwright and Mr. T. H. W. Walker, architects, both spoke of the 9ft. passages as conducing to nuisances and the annoyance of tenants. Mr. F. Stewart, architect and surveyor for Lord Salisbury, and Mr. W. F. Beavan, house agent and auctioneer, gave similar evidence. Mr. Joseph Wilson, as a property owner, also opposed the application as curtailing backyard space and favouring accumulations of refuse. The inquiry then terminated.

#### CHESTER CATHEDRAL CHURCH.

MR. CHARLES HIATT has compiled a most compact little volume giving a succinct description of the fabric of this famous church, together with a brief account of the history of the Episcopal See of Chester. The book forms one of the Cathedral series which Messrs. George Bell and Sons, of York-street, Covent Garden, are now producing, under the editorship of Mr. Gleeson White, who, in the preface, acknowledges his indebtedness, amongst other authorities, to Murray's "Handbooks to the Cathedrals."

This present guide is illustrated by process-block reproductions of photographs, a key-plan, and a couple of old engravings, one showing the cathedral at the end of the 17th century, and the other illustrating it as it was a century later. The frontispiece of the book shows the church from the same point of view as it appears to-day. This illustration accompanies our present notice. It includes the conical roof over the apsidal end to the south aisle of the choir, as rebuilt by Sir Gilbert Scott, who carried out, at Chester, much restoration work. His overbearing pinnacles surmounting the turrets flanking the eastern gable of the choir are very much out of scale; but the re-erection of the unique stone roof just mentioned was more than justified. The remark of the writer of this guide, that it looks "like an elaborated chimney" might be intended to pass as smart up-to-dateness. The effect, no doubt, of this roof is unusual in England, of course, and as it becomes "moulded by time" an added grace will modify its sharpness of form. Architecturally, it certainly enhances the interest of the building, and recalls to the memory some churches in Normandy. Sir Gilbert's lucid descriptions of the fabric in general have proved themselves very acceptable to the writer of this handbook, who has had the good judgment to give Scott's own words verbatim where any special point is touched upon.

To recapitulate the history of the cathedral on this occasion is uncalled for, and, besides, such an attempt would exceed our available space, although its existence as a cathedral church only dates actually from the Patent issued by Henry VIII. on August 4, 1541, when John Bird, Bishop of Bangor and Provincial of the Order of Carmelites, was made first bishop. The chief characteristics concerning the church and its precincts are very well described, and the author has taken care to keep his notes clearly grouped under leading headed lines for ready reference when visiting the buildings. The volume is well got up in an artistic cover, and the printing is excellent. The second view which we give shows the entrance to the vestibule leading to the chapter-house from the cloisters, in some respects reminding one of the arrangement at Westminster. Besides some particulars of the conventual buildings, a note is added on the Collegiate Church of St. John the Baptist, so intimately associated with the See of Chester, although it is located outside the city walls. These volumes are quite unlike the ordinary guide-book in all respects except in the matter of their portability, a convenience which is always a great recommendation to an itinerary.

The town council of Ramsgate have decided to construct a sea-wall in front of the Victoria Gardens at a cost of £8,000.





ENTRANCE TO THE VESTIBULE OF CHAPTER HOUSE, CHESTER CATHEDRAL.

## FIREPROOF STRUCTURES.

IN a recent issue of *Stone*, under the heading of "The Fire-trap Modern Sky-scraper," William Sooy Smith, a Chicago engineer, reviews at some length the fires that have occurred in this class of buildings, and makes the following observations as to the action of iron and steel when subjected to heat, and suggests later the use of stone, protected by more obdurate materials, in these buildings. He says:—

The rate of expansion or contraction of iron and steel, which are practically the same, is one 130in. per foot for a change of temperature of 100°. If a vertical post or column of iron or steel is 150ft. in height, the total expansion for a change of 100° in temperature will be 1 1/4 in.; and for a change of 1,000° (to red heat), 15in.; and this change frequently occurs during a fire.

While a column changes its length 15in., the integument of stone, brick, or tile expands or contracts much less, and so a "war to the death" takes place between the component parts of what we call "steel buildings."

There may be steel buildings in which the fireproofing has been so well done that they will pass through an ordinary fire without such failure; but if the steel becomes even moderately heated, its stiffness will be measurably diminished, and the strength of the upright members so reduced as to cause them to bend and yield. This is more likely to occur, as the horizontal beams and girders will at the same time expand (unequally from the different degrees of temperature), and throw the posts out of vertical and into buckling positions. This is the third difficulty.

It is as if a man were required to stand upright and take upon his shoulders all he could stand under, then take a strong dose of physic, and have his knees pushed from under him.

Under these circumstances, if floors were built of perfectly rigid materials, the unequal settlement would crack them into pieces and ruin them. The elasticity of the steel beams now used in the

floor systems partially obviates this difficulty, but not wholly, as many floors in which they are employed, notably those of our post-office and custom-house buildings, are badly demoralised and broken up by unequal settlements. Here is the fourth difficulty, and our present system does not provide for it satisfactorily.

Now, supposing that we have succeeded in overcoming the great difficulties already pointed out—if steel and iron are used as principal parts of our buildings, and these parts are not perfectly protected from corrosion, the building will be comparatively short-lived.

There are many imperfections in minor details, such as weakness of brackets and their fastenings, want of proper provision for resistance to strains resulting from wind pressure, &c., which we need not here describe or discuss. They are only alluded to because they are liable to occur in the class of building we have under consideration, unless they are guarded against by the architect who designs, and the superintendent or contractor who builds the structure. There is little danger of such defects in the buildings planned by many of our excellent Chicago architects, and erected by first-class Chicago builders. The well do not need prescriptions: they are only for the sick.

Having thus considered the difficulties of our problem, let us endeavour to discover proper remedies for them, for we perform the most valuable service when we do not merely discover a difficulty, but when we point out the best way to overcome it.

The third difficulty, resulting from the expansion and contraction of the metals employed in the construction of tall buildings, may be obviated by protecting these metals absolutely from any considerable change in temperature, if this be possible, or by throwing out the metals altogether and substituting tile, brick, and stone, as far as may be practicable. As the weights to be borne by the vertical members of buildings, such as we have described, are very great, it becomes necessary to use materials and models of

construction which will make these vertical members as small as may be in cross-section, consistently with the loads they have to carry and the strains they have to resist, in order to economise floor space, which is the revenue-producing part of the building.

Now, first-class cut stone masonry laid in hydraulic cement mortar has about one-fourth the compressive resistance of the stone of which it is composed. If, therefore, the stone themselves can be placed in absolute contact, without the interposition of mortar, it is fair to presume that much greater compressive resistance of the material would be obtained. To test the truth of this supposition, I had a square pillar of Lemont limestone made by the Western Stone Company, 1sq.ft. in cross-section and about 9ft. high. It was composed of seven stones, taken from their thickest stratum, and so cut as to lie on the natural bed in the pillar when this was set up. The bearing surfaces of the blocks were planed perfectly true. I sent this pillar to the Government testing machine at Watertown, Mass., and asked that it be set up by simply washing the beds with a very thin grout of the very best English Portland cement. This pillar was subjected to the entire crushing power of the machine, 800,000lb., and it was only when the full strength of the machine was employed that the pillar showed the slightest symptom of yielding. Then small flakes were chipped off the outside surfaces of two of the blocks, which is proof that the pillar was on the point of yielding. If pillars or columns having a cross-section of 4sq.ft. instead of 1sq.ft. were used, the total resistance of such pillar to crushing would be far more than four times 800,000lb., for it is a well-known fact that the crushing resistance of any substance increases in greater ratio than the area of cross-section of such substance.

If, however, we assume that the strength was increased in that simple ratio, a pillar 2ft. square of Lemont limestone, made as already described, would sustain a weight of 3,200,000lb. One-third of that load, or, say, 1,000,000lb., would be a safe load for such pillar. If we add a covering 2in. thick on all sides of a pillar, which is sufficient to afford it all necessary protection from fire, if a method is used which will shortly be described, the whole size of the pillar so protected would be but 2ft. 4in. each way, which is but little larger than many of the steel columns now used with their fireproofing. These pillars would, of course, decrease in size as the loads decrease, story by story, from bottom to top of the building. The blocks of which they are composed may be doweled by a steel rod running down through the centre of the pillar, and connecting cap plates of cast iron that should be put on the pillars at the level of each story.

If limestone, or any other kind of stone, which does not resist heat well is used, it can be protected by a covering of agolite or any other very refractory, non-conducting and non-expansive material. I have seen a slab of "agolite" only 1in. in thickness that was held over a flame at white heat half an hour, and then turned over and carried off on a man's hand, without burning it. With such material properly put on and secured to a non-expansive stone column, there would be little danger of any injury to it by fire. But to avoid absolutely the injury that might come to it by any cause that might crack or remove the covering, and so cause its destruction (as in the case of the steel column), a strong and very refractory stone should be selected for the columns, such as that used in the lining of blast furnaces, which resists for months the white heat to which it is exposed. Of course, such stone would need no fireproofing.

Plates or cap stones can project sufficiently to furnish a support to arches of tile or béton coignet, which should be used for the floor systems. In wide buildings the pillars should be set in line at right angles to each other, and at suitable distances to make it practicable to construct the whole floor by a groined arch or dome system supported by these pillars.

This system of floor construction is by no means new, as it has been in use for centuries in Spain and Italy. It has been recently introduced into America by a Spanish engineer, Mr. Guastavino, and has rapidly come into use in Eastern cities. It has been found practicable to make strong floors with a very slight rise of the arch in proportion to its span. Steel rods have recently been built into the material of the floors thus constructed, protected from heat or corrosion, and so



placed as to take and resist the horizontal thrust of the arches.

There is a balancing and neutralising of this thrust throughout the entire system of arches except the exterior ones next the outside walls, and it is only in the case of these exterior arches that special provision must be made to take up this thrust.

This may be done by building in twisted steel or rods as above described, or by horizontal tie-rods thoroughly protected from the effects of fire by a thick covering of agolite or asbestos. And the outside walls should for this purpose, and for better security from fire in an adjacent building, be made heavy and strong.

If the mode of construction here pointed out is adopted, the building would be practically unchangeable in its dimensions, indestructible by fire, abundantly strong, and as durable as the materials of which it is composed.

It also seems, from the best estimates I can make, that a building constructed in this way will cost less than one with steel and iron framing. Tile, brick, and stone do not corrode, and, while mistakes may be made, and imperfections in design and workmanship are quite as likely to occur in the use of these materials as in that of iron and steel, these can be obviated in both cases by skill and fidelity, without which no system of building can be made successful.

#### ADAPTABLE SPECIFICATIONS.

—XXXVI.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued.)

THE BUILDING NEWS has given, and is still giving, in another series of articles, so much detailed information about the making and testing of cast iron, wrought iron, and steel, that the superintendence of *Ironfounders' and Smiths' work* need only be very briefly dealt with at this point. In a large proportion of the architect's works he uses these metals in such small quantities that elaborate tests for them are almost out of the question. He knows that his cast-iron ought to bear a tensile strain of seven or eight tons to the square inch of section. He knows that a bar of it, 3ft. long between the supports and 2in. deep by 1in. wide, should not break under cross-strain with a less load than  $1\frac{1}{4}$  ton applied at the centre. But to make use of these tests, bars have to be cast on purpose, and it is by no means easy to make sure that the test-bars have really been cast from the same metal as the columns, or other features whose strength it is desired to ascertain. Practically, and where a very small amount of ironwork is in question, the architect has to take the founder's word for this, and he therefore generally finds it safest to get the work done by a founder whom he can rely on, and who, for the sake of his own reputation, will do the necessary testing himself. In a large engineering contract the case is very different; but elaborate tests for common everyday buildings hardly come within the range of practical utility. Some rough idea of the quality of cast iron may be formed by tapping its surface with a hammer. If this chips it, the metal is hard and brittle; but if this slightly indents it, the quality is likely to be satisfactory.

What may be termed accidental faults in castings are frequent. Hollow columns, if cast horizontally, are very apt to be thicker on one side than the other. This fault often results in a slight concavity on the thinner side, by which it may be detected. Air bubbles, which are another source of weakness, may often be discovered by the sound when the casting is lightly struck in different parts. The metal in that part of a casting which was highest when fluid is usually more porous than that which was at the bottom, and which therefore solidified under greater pressure. Unequal thickness of metal in different parts of the same casting is a prolific source of evil, and Mr. Horner, the author of the articles above referred to, has pointed out that the special section of cast-iron girder, which a generation ago was supposed to represent almost ideal scientific perfection, could hardly be cast straight without extraordinary precautions on the part of the workman. The inventor of the girder—once in almost universal use—had firmly grasped the fact that cast iron is immensely stronger against compression than against tension. Consequently, in an  $\Gamma$  girder he made the bottom flange five or

six times greater in area than the top one. Theoretically, this was all very well; but in practice the result of having so much more metal in the bottom flange than the top one was that the girder, instead of being straight, came out of the mould with a visible curve or camber from end to end! The textbooks of the period did not mention this little imperfection of their pet girder; but the founder's workmen seem to have been familiar enough with it; and they often got over the difficulty by cambering their pattern to about the same extent, but in just the opposite direction. Cast-iron girders are, happily, almost things of the past. Cast-iron columns remain, and seldom fail from direct pressure. One-sixth of their theoretical strength is the very largest load that should be put on them. The lugs and brackets to support beams and girders, which are sometimes cast or even "burnt" on to their sides, are far less to be trusted than the columns themselves. Yet it is no rare thing for the lives of hundreds of people to depend on the tenacity with which these appendages adhere to the shafts they are stuck against.

Where iron columns stand one upon the top of another, the beds should be true and level, and the upper columns should, of course, stand directly on the lower ones or on an incompressible packing between, and not, for instance, on the wooden beams which may run across the bottom pillars. To set the bases truly on stone or granite templates, it is recommended first to set up the column truly and vertically on the stone by the aid of iron packings, and then to run the joint carefully with neat Portland cement. A temporary inclosure of brick in cement may be built round the base, and the liquid cement poured into this, so as to stand at a higher level than any part of the space between the iron and the stone. Beds between column and column which cannot safely be cemented in this way should be faced truly in a machine. Where cement is used, no heavy weight should be allowed to come on it till it has set hard—say, for a fortnight or more.

A great gain was made in safety of construction when rolled iron girders superseded cast ones. The latter, when they fail, which is seldom, do not, as a rule, fall suddenly. They give warning of their weakness, and they are seldom, therefore, responsible for loss of life. Rolled iron, however, has its weak places, often caused by the presence of "scale"; and welds, in wrought iron work, are seldom as strong as they are supposed to be. From their superiority to defects like these, and from their greater strength in proportion to their price, mild steel joists and girders have now largely superseded rolled iron ones. When they first came into use, grave doubts were felt in many quarters as to their trustworthiness. These doubts resulted in the general application of severe tests to nearly all steel used for structural purposes, and the issue has been that mild steel is now less liable to suspicion than rolled iron itself. It used to be supposed that there were considerable differences in steel when tested with and across its grain. This happens with wrought iron, but experience has now led to the conclusion that in steel the strength either way is about the same. Steel, moreover, is much more uniform in quality in different parts of the same detail than wrought iron. A piece cut out of one part of a steel plate will bear about as much as a similar piece cut out of any other part of the same plate, and testing so far be safely relied on. In the same rolled iron plate, on the contrary, one portion may be of excellent quality, while another may be scaly or laminated, and a test-piece from the first section might cause the iron to be thought much better, and one from the second much worse, than it really was on the whole. For good structural work mild steel should break with a tensile strain of not less than 26 tons and not more than 30 tons per square inch. Pieces 8in. long and  $1\frac{1}{2}$ in. wide are usually tested, and they ought to elongate at least 20 per cent. before finally giving way under tension. The Admiralty also require that test-pieces of this size, after being heated uniformly to a low cherry-red, and then cooled in water, shall bear, without injury, being bent double in a press, to a curve the smallest radius of which is one and a half times the thickness of the sample. Steel should never be worked at what is called a "blue heat"—that is, between about 400° and 600° Fahrenheit. When this is done it loses its ductility, and is liable to break quite suddenly instead of stretching by degrees.

In small structures, and sometimes in large and monumental ones too, the architect has more to do with the smith than with either the iron founder or with the manufacturer of steel and iron girders. The quality of the material is of the utmost importance in delicate works of wrought metal. The modern blacksmith buys his iron in rods or bars: the ancient one had to make his bars for himself, out of lumps of wrought iron. The consequence was that his productions were less mechanical and more obviously "handmade." They differed from the doings of the 19th-century art-workman just as the irregular twigs and branches of a natural tree differ from the rectilinear ones in Mr. Ruskin's diagram of "A tree by ye clerke of ye workes." The modern smith, when he cares enough about his decorative work to try and put a little life into it, will sometimes begin by working up and hammering the rigidly straight bars or rods which are supplied to him, so as to get a little variety in their lines. If they are to serve his purpose they must be tough and fibrous, so that it may be possible to twist and bend them about to the utmost extent without breaking them. He has to bear in mind, too, the direction of their fibre, and not, for instance, to work his tenons the wrong way of it.

In Early Mediæval times the different parts of a work in wrought iron were chiefly joined by welding them together, at a white heat, into one solid mass. Sometimes, however, where a number of stems or rods had to be joined at the same point, and welding was difficult, they were united by an iron collar or band, shrunk on while hot. In later periods, less permanent and workmanlike modes of joining came into fashion. Wrought-iron work, at one time, was closely modelled on the types appropriate to joinery, and in putting it together, mortises and tenons, rivets and bolts were found convenient. In inferior modern work even a lower point than this may be noticed. Scrolls and other ornaments are simply screwed on, and no one with two or three ordinary tools in his pocket need find his way barred for many minutes by one of these 19th-century screens or grilles. Thin iron bars bent cold are another device in favour just now with those who produce colourable imitations of genuine smith's work. The more iron is worked and twisted when cold, the harder and more brittle it becomes. Stamping leaves and similar ornaments out of thin sheet iron is another expedient beloved of those whose lives are passed in trying to produce the largest amount of show for the smallest possible amount of money. The only things that result from dodges like these are flimsiness, flatness, and wearisome mechanical uniformity. A little bit of honest smith's work, hammer-made, and welded, is better than a factory full of these cheap and nasty pretences, and, with anything like fair treatment, too, it will remain perfect for ages after they have dropped to pieces and gone to rust.

#### STREET-CLEANING ON THE CONTINENT.

STREET-CLEANING in Paris and Berlin is the title of an article in the *Engineering Magazine*, by Mr. Robert Grimshaw. The writer compares the uncleanly streets of the American cities with those of Paris and Berlin. The visitor to the first is impressed with the cleanliness of the road surfaces, spite the fact that its streets are constantly crowded. The work is now under the control of the Prefecture of the Seine, and it is found that great economy has been effected. The street-cleaning department is under the control of four bodies; the first has to purchase and maintain the materials, the second employs the men, the third does the sprinkling, and the fourth removes the offal and rubbish. Dealing mainly with the second division, the author says the first sweeping and scrubbing is done in the early morning at the expense of owners or tenants at the rate of about six cents per square yard; while the day cleaning is paid for by the city. Men and women are both employed on the street-cleaning corps, which is divided into 149 brigades. In the heart of the city one of these brigades consists of a chief, one assistant, and 25 labourers, who may be men or women. The major portion work only in the morning. During the second half of the day "cantonniers" are employed, whose duty is to clean the streets, urinals, police stations, markets, and cab-stands. Both the hand-broom and the sweeping-machine are in use, the latter being chiefly used upon stone-paved streets, the former





NEW PREMISES, BLACKFRIARS ROAD, S.E. for Messrs W. & F. Faulkner, Ltd.

upon asphalt and wooden paving. These machines are of two kinds, the Sohy and the Blot. The former has a cylindrical brush 75in. long, and sweeps a strip 74in. wide on the first trip, after which the parallel strips run from 48in. to 64in. width. At the rate of travel of about 240ft. per minute, each machine will sweep 7,200 square yards hourly. The "Blot" machine has a shorter brush, not so obliquely placed, and is drawn by a horse. The hand-brooms are of the "piassava" a tough South American palm fibre. On the asphalt roads the work is done thoroughly. Rubber squeegees, 32in. long, are also used. In the early morning the hydrants are opened, and the asphalt is flooded, then the squeegees are used, also the brooms; after this early cleaning the work is light. Sprinkling is always done by hose, watering-carts, scoops, or pots before the sweeping. Between 4 a.m. and 6.30 the side-walks and streets are cleaned and sprinkled, sand is strewn on the asphalt, and the cab stands washed and disinfected. The sweepings are removed afterwards, and this work is done by contract. In Berlin the street cleansing is done by the municipal authority, and is done thoroughly, the asphalt being sprinkled and cleaned twice or more a day. Mr. Grimshaw's article is also worth attention by many authorities in London and elsewhere.

#### NEW PREMISES, BLACKFRIARS ROAD.

THESE premises are being erected for Messrs. W. and F. Faulkner, Limited, tobacco manufacturers. The building shown in the illustration faces Blackfriars-road, and will contain the offices, packing department, stock-rooms, &c., with the principal entrance. Externally, the materials used are red brick and Portland stone. The main factory is in the rear, with extensive frontages to New-street and Warwick-street. The general contractors are Messrs. Holloway Bros., of Queen's-road, Battersea, and the engineers Messrs. Maudslay, Sons, and Field, of Lambeth. The architect is Mr. R. J. Thomson, A.R.I.B.A., of Wimbledon.

#### A HINT FOR A PUBLIC FOUNTAIN.

ABOUT half a mile above Franklin, up the Erie Railroad track, is to be seen one of the most curious sights in the United States. Approaching a small, sluggish stream, we were surprised to see rising from the surface of the water a number of bubbles, which glistened in the sun like glass. It was a beautiful sight. The iridescent spheres, revolving swiftly, after the manner of soap-bubbles, floated rapidly upward, some breaking at a height of 10ft. or 20ft., others soaring away

above the tree-tops and out of sight, resembling, more than anything else, gorgeous toy balloons. These bubbles were all sizes, from 1in. in diameter to more than 1ft. They were apparently much stronger and a good deal more brilliant than ordinary soap-bubbles. A gas-line and an oil-line had passed under the run at this point, within a few inches of each other, and in each pipe was a small leak. The digging and refilling of the trenches has made a dam which held a few barrels of stagnant water. There was some alkali in the muddy bottom, which, in combination with the oil, formed saponule, a kind of soap. This, while not being a perfect soap, was sufficiently saponaceous and cohesive to make beautiful bubbles when churned by the escaping gas. The fact that the bubbles were full of gas caused them to ascend more swiftly and the presence of the oil made them more brilliant, many-coloured, and unusually beautiful.

The Committee of the Colonial and Continental Church Society has bought a site for an English church at Lucerne, to commemorate the Diamond Jubilee. The site is on the north side of the Haldenstrasse, the main street running through Lucerne, and in the midst of the hotels and pensions. The cost of the site and the erection of the church, which is to seat 450, will be about £7,000.



## WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XIII.\*

THE fact that the weights and sectional dimensions of rolled iron and steel are so limited involves the building up of all large masses in detail. There are advantages as well as disadvantages in this. Building up is expensive work; but this is compensated by the facilities which it affords for such arrangements of material as best correspond with the stresses at

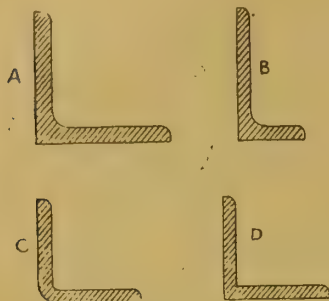


FIG. 38.

different sections. This result is not so practicable of attainment with cast metals, because severe shrinkage stresses occur in localities where heavy and light masses occur in close proximity. Also, the facilities which some sections afford over others for the attachment of primary and secondary members has to be borne in mind in building up elementary parts. And rolled sections have this very great advantage over cast work, that webs and flanges are able to receive connections in which the stresses are directly tensile. Such connections have to be made in most work, and therefore those sections which afford such facilities are often selected on that account.

There are few sections rolled which are sufficiently rigid in themselves for heavy duty. Plates and flat bars are too weak to sustain any severe stress. Yet when buckled, or arched and concreted, thin plates will sustain heavy road traffic. No large plates, however, can be used for other purposes without due external stiffening. The joists and the channel bars are the best examples of rolled sections which are stiff enough in themselves to withstand severe strains. Other sections are seldom used except as stiffeners, or when being stiffened. Hence plates, bars, rods, angles, resemble each other in this, that they are seldom used singly except for stresses purely tensile, because they are not rigid enough in themselves to sustain compressive or cross bending stresses. Yet, given a few elementary forms, each in a wide range of dimensions, nearly every desired combination can be produced.

There is one disadvantage in multiplying the separate parts in building up the elementary members of complex structures—viz., the loss of strength due to additional lines of rivets, besides the extra cost involved in the work entailed by riveting. It is therefore very desirable to utilise as far as practicable those sections which will answer with the saving of a line or two of rivets. Thus rolled joists are used for many girders,

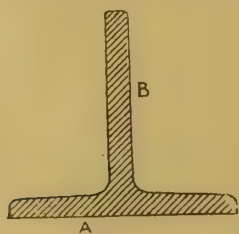


FIG. 39.

instead of building up plate girders. The joists are used single, or are compound, and in cases where loads are exceptionally heavy they are trussed. A great deal of riveting is saved in this way. So the zed section often serves instead of riveting two unequal angles back to back; the tee

often serves instead of two angles. In each case a single line of rivets is saved. The use of bulb sections in cases where the bulbs do not come in the way will often render unnecessary the riveting on of a stiffening square, or flat bar along an edge. The use of a channel bar will often prevent the riveting on of two angles on a wide flat bar. Many illustrations of these kinds will occur in the examples of built up work which will be adduced in the papers to follow.

Running through the different sections other than plates which are utilised in constructional work, the angle merits the first mention. The angle is valuable in two ways. Though of little use above, it is the most useful element of union between other sections, and it is one of the most useful stiffeners, both when employed for jointing, and when for stiffening only. Without it the building up of girders and structures would be most restricted. With it there is scarcely any desirable combination which is not easily practicable. It affords one useful example of the arrangement of the minimum of material to insure the maximum of strength. It is manufactured in many sizes, ranging between 1 in. by 1 in. and 8 in. by 8 in. Yet the essential forms are few. They are the equal angles, Fig. 38, A; the unequal sided angle, B; the round backed, C; the square throated, D; and the bulb angles, Fig. 40. These are the only forms used in constructional work, with the exception of what are termed splayed, or obtuse and acute angles, which are ordinary forms rolled with the webs set at other than right angles. In Fig. 38 C and D are used to a slight extent only; C is mostly for covering angles over joints, and for the corners of pillars; and D in the case sometimes of

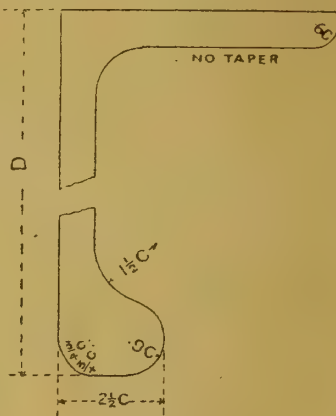


FIG. 40.

angles being superimposed. But the radius at the root, A and B, is so important an element of strength, that the cases are very exceptional in which square-throated angles D should be used.

Iron angles of ordinary sections are rolled to 30 ft. long only. But steel angles are rolled to 50 ft., without extras. Equal-sided angles, Fig. 38, A, are obtainable from 1 in. by 1 in. by 1/2 in. to 8 in. by 8 in. by 1 in. Every angle of a definite breadth of flange can be rolled to at least two thicknesses, one thin, the other thick, as 1/2 in. or 3/4 in., 3/4 in. or 1 in., 1 in. or 1 1/2 in. The limiting sizes of steel angles at ordinary rates are usually 6 in. by 6 in. by 1/2 in. to 1 1/2 in., by 50 ft. in length. The Butterly Co. roll iron angles up to 7 in. by 7 in. by 3/4 in. to 1 1/2 in. The Lillishall Co. roll angles in both iron and steel ranging from 3/4 in. by 3/4 in. by 3/4 in. to 1 1/2 in., to 6 in. by 6 in. by 3/4 in. to 1 1/2 in. From 10 to 11 united inches of section in steel and nine in iron is the usual limit for angles at ordinary prices. Over that, about 5s. per ton per inch of extra section or part of an inch is charged in steel, and 10s. in iron. But even sections within the limit are extras, if rolled with specially thin flanges. Thus the Scottish steel-makers charge extra for angles having as much as six united inches of section, and larger, if the thickness of flanges is less than 3/4 in.; 2s. 6d. extra per ton of the flanges down run to 1 1/2 in.; and 5s. per ton if to 1 in. All angles of light section are extras. The Scottish steel-makers put the lower limit at six united inches. The Butterly Co. put it for iron angles at three united inches. The light sections are charged extra, both for reduction in united inches and in thickness. In steel 7s. 6d. per ton per 3/4 in. or part below six united inches is

charged. Angles 3/4 in. thick are charged 10s. per ton extra, those 1/2 in. thick 20s. per ton. In iron, angles of three united inches, if 3/4 in. thick, cost 10s. per ton extra; if 1/2 in. thick, 20s.

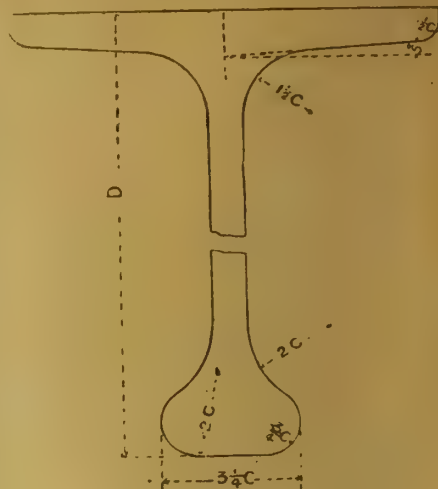


FIG. 41.

per ton, and price increases slightly with diminution of size and thickness. An angle of 1 1/2 united inches, 3/4 in. thick, costs 15s. per ton extra; if 1/2 in. thick, 25s. per ton. Since all thin angles cost more per ton than thick ones, it is often cheaper to use a single large thick angle than two smaller ones of equal strength. The extra for angles charged by Messrs. Bolckow Vaughan are: for those under six united inches, 10s. for each 1/2 in.; for those over 10 united inches, 10s.; these terms applying to plain and bulb angles. Also, angles thinner than 1/2 in. and not less than 1/4 in. are 10s. In addition, bulb angles are 20s. per ton over ordinary angles. Unequal-sided angles, Fig. 38, B, occur in dimensions from about 2 in. by 1 1/2 in. breadth of flanges, up to 14 in. by 3 1/2 in. But 6 in. by 5 in. or 7 in. by 4 in. is the ordinary maximum limit. Round-backed angles C and square-throated angles D do not occur in a large range, nor are they rolled by all houses. Their use is limited, and their dimensions also, being confined to about 2 1/2 in. by 2 1/2 in. to 5 1/2 in. by 5 1/2 in. Bulb angles are often used when angles are used as ribs or stiffeners, the bulb being imparted to stiffen the weak edge. They range from 5 in. by 3 in. to 11 in. by 3 1/2 in., with two thicknesses in each size.

The plain angle, equal or unequal, is the elementary basis of other sections. Two angles placed back to back form a tee, four angles the cruciform section, two angles at the edges of a

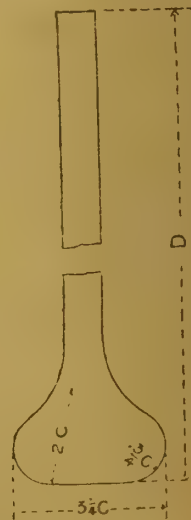


FIG. 42.

flat bar form a channel, four angles and a flat bar a joist. Two angles united with flanges turned in opposite directions form a zed. By these combinations riveting is saved, and full strength of section maintained.

\* This instalment should have appeared before that which, by an error, was printed on p. 448 in our issue of March 26. Readers will notice this, and will oblige by remembering that that is No. XIV. of the series, and not No. XIII., as wrongly headed.



Flat bars are used extensively in all classes of bracing, and for ties, being often for the latter purpose much more convenient than rounds, because they lay closer, and the ends are more conveniently formed into eyes for pins, or punched for rivets. Flat bars range from  $\frac{3}{8}$ in. to 12in. wide, and are obtainable as wide as 18in. Thicknesses range from  $\frac{1}{8}$ in. to  $\frac{3}{4}$ in. Iron flats of ordinary section are rolled to 25ft. in length without extra charge, over that special agreements have to be made. They are charged extra as follows: over 6in. to 7in. wide, 10s. per ton; over 7in. to 8in., 20s.; over 8in. to 12in., 30s. Small iron flats are charged highly, especially when very thin. Thus, if under  $\frac{1}{8}$ in. wide, and from  $\frac{1}{8}$ in. to  $\frac{3}{8}$ in. thick, the extra is 160s. per ton. If  $\frac{3}{8}$ in. wide, and  $\frac{1}{8}$ in. thick, it is 40s. Bars from 3in. to 6in. wide, if very thin, as  $\frac{1}{8}$ in., are 10s. extra. In steel, bars from  $7\frac{1}{2}$ in. to 12in. wide are only 5s. extra per ton, and up to 40ft. in length ordinary prices are charged.

Bulb bars are used for the same purpose as bulb angles—that is, for extra stiffness. They range from 6in. to 12in. in breadth, with a wide range in thickness, from  $\frac{1}{2}$ in. to  $\frac{3}{4}$ in. Iron bars are obtainable up to 10in., steel above that, and steel in the lower dimensions also. Every bar can be had either thin or thick, as  $\frac{3}{8}$ in. or  $\frac{1}{2}$ in., &c.

Tees (Fig. 39) are little less useful than angles, being often employed for similar functions. They are especially serviceable as connections and stiffeners. They serve as connections between plates and lattice-bars, as purlins for roofs, as ribs in many framed structures, and they often save the labour of riveting up angles. They are obtainable in lengths up to 50ft. and 60ft., and in various dimensions. The first dimension given is always understood to be that of the width of flange, A in Fig. 39, and the second the depth of stem or web B. The second seldom exceeds the first, most often being less, except in bulb tees, which, being used for special stiffness, have, as a rule, the depth of web much in excess of the width of flange. Tees range from  $1\frac{1}{2}$ in. by  $1\frac{1}{2}$ in. by  $\frac{1}{2}$ in. to 6in. by 3in. or 7in. by 3in. by  $\frac{3}{8}$ in. and  $\frac{1}{2}$ in., or 6in. by 5in., or 6in. by 6in., &c. Iron tees are rolled as large as 4in. by 4in., but steel tees up to 6in. by 6in. Equal-sided tees are obtainable from 1in. by 1in. to 4in. by 4in., and in some houses to 6in. by 6in.

Bulb tees, useful when special stiffness is required, range from 5in. by 4in. to 12in. by 6in., or  $6\frac{1}{2}$ in. in depth of web.

Bulb bars, though employed mainly in ship-building, yet fill a useful place in constructional work. The dimensions of the bulbs are not arbitrary, but are subject to rigid requirements. Lloyd's rules for the dimensions of bulbs are given in Figs. 40-42. The unit C is deduced from the depth D. The widths of the bulbs to be  $2\frac{1}{2}$  C for bulb angles and  $3\frac{1}{2}$  C for bulb plates and bulb tees, where C is  $\frac{D+3}{20}$  in the case of

bulb angles and  $\frac{D+1}{20}$  for bulb plates and

bulb tees. The form of the bulbs to be in accordance with the sketches. The standard thickness for regulating the width of bulb of beams and bars whose depth is not an exact number of inches should correspond to the depth in inches next below the actual depth, thus:—For T-beams and bulb plates 10 $\frac{1}{2}$ in. deep, the standard thickness to be used in determining the dimensions of the bulb should be  $\frac{10+1}{20}$  or  $\frac{11}{20}$ .

J. H.

## STABLE CONSTRUCTION AND SANITATION.—X.\*

### DRAINAGE.

THE principal materials used for stable paving having been considered, it becomes necessary to ascertain the best method of effecting the removal of the solid and liquid refuse. From the inevitable circumstances of the case, the excrement and other solid waste matters must be removed by hand at frequent intervals in order that the building may be maintained in a permanently sanitary condition; but with regard to the liquid portion of the refuse, particularly urine, it is essential that adequate means should be provided for its immediate removal, owing to the rapid decomposition which takes place, especially if some degree of heat and moisture be present.

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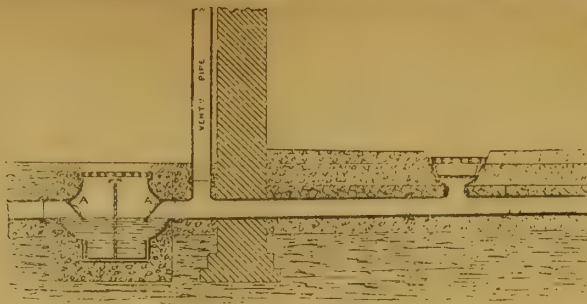


Fig. 87.

Frequently the liquid refuse is removed from stables by means of underground drains, the floor of the stalls and loose boxes being currented to one or more surface gullies or stable-pots conveniently situated for the purpose within the building. Sometimes the gullies inside the stable are trapped and directly connected with the general drainage system, but such a method cannot be looked upon as affording the best means of removing stable sewage. The seal of each trap consists of the most part of stagnant urine,

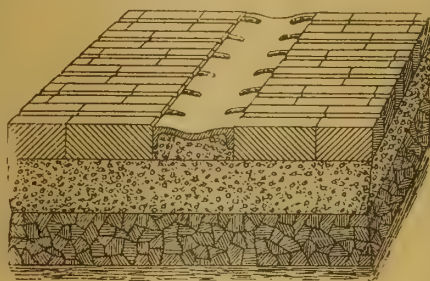


Fig. 88.

giving off unwholesome ammoniacal vapours, so that the air of the stable seldom smells fresh and pure.

In some instances the internal surface gullies are trapped, and discharge into a trapped gully immediately outside. Fig. 87 shows an arrangement of stable drainage as devised and carried out by a well-known firm. The internal trapless gullies are provided with perforated baskets to retain the straw and other solids passing through the surface gratings, the drain discharging into a trapped gully outside. Removable caps are provided at A A, to admit of the drains being inspected and cleaned when necessary.

From a sanitary standpoint, there are serious objections to any arrangement of underground drains within stables for the removal of liquid refuse. For permanent efficiency it is considered that the most satisfactory method of draining the interior of stable buildings is by means of surface channels discharging the whole of the waste

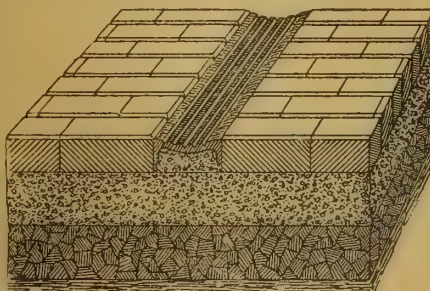


Fig. 89.

liquids directly into trapped gullies placed outside for the purpose.

Where rough and careless usage may generally be expected, as in stables for farms, tramway companies, breweries, general carriers, &c., it is necessary that the drainage arrangements should be of the simplest description, with an entire absence of movable gratings and loose perforated covers within the building, as such articles are liable in course of time to get broken or lost. The whole of the internal drainage should therefore be conducted to the outside by means of open

surface-channels, as shown in Figs. 1, 41, 43, and 44, the floor of the stable being laid to proper falls towards the channels. Figs. 73, 74, 85, and 86 are sectional sketches through the floor of a stall, showing the general arrangement of different varieties of paving bricks laid with an open channel in the centre. Figs. 88 and 89 also illustrate other forms of open-channel drainage for stalls, in which cast or wrought-iron gutters, firmly embedded in concrete, are substituted for brick channels. The surface of the iron guttering is either roughened or formed with a series of slight projections to prevent the horses slipping thereon. Open iron channels are, however, apt to be slippery, whilst if the surface of the iron is too much roughened or indented, the horse's limbs are liable to be bruised and cut in the act of getting up or lying down.

Fig. 90 is the plan of a stall showing a form of

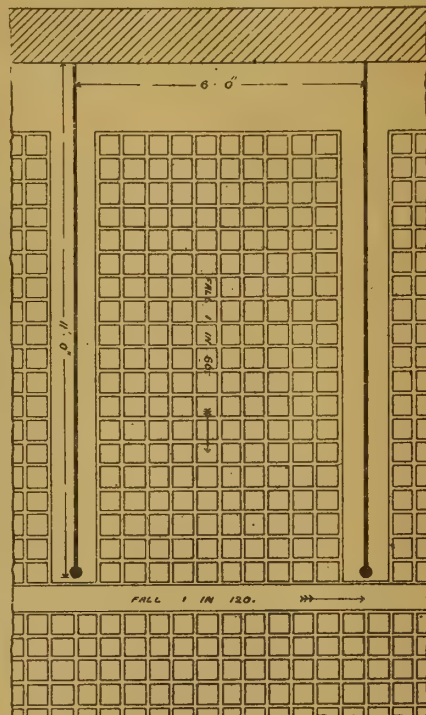


Fig. 90.

grooving and channelling sometimes adopted for a concrete stable floor. The surface is divided into a series of small squares by means of longitudinal and transverse grooves spaced about 5in. apart. The whole of the longitudinal grooves are arranged to fall directly towards the main channel. The greatest objection to this form of grooving for stalls and loose boxes is the difficulty experienced in thoroughly cleansing the floor owing to the numerous cross-grooves. A method of grooving and channelling frequently used for the concrete floor of stalls is shown in Fig. 91. The grooves fall towards a central channel, which in its turn empties into the main channel at the rear of the stalls. Fig. 92 shows a modification of the form just described. Instead of one central stall channel two grooves are substituted, having a plain surface of concrete between them. Each of these small channels receives the drainage of half the "standing" and empties directly into the main channel at the rear. By this means the centre portion of the stall floor—where the



heaviest wear and tear is experienced—is quite unbroken by grooves or channels, and a greater strength of material is consequently obtained at this point. Another arrangement of grooving and channelling is shown in Fig. 93, the object being to avoid the use of central longitudinal

deep. Such a section—having no internal angles—admits of being readily cleaned with a broom. The main channel at the rear of the stalls should be comparatively wide and shallow, so that it may not be a source of danger to horses when passing over it. Figs. 95 and 96 are sections

surface, so that the stall channels may discharge over it (see Fig. 100).

Generally, the invert of the main channel is parallel with the surface of the floor, both being

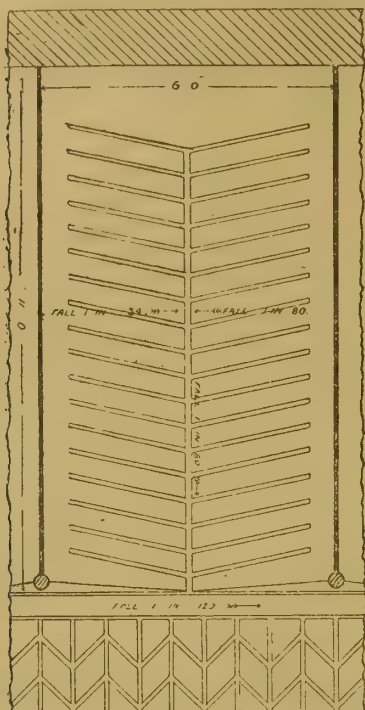


Fig. 91.

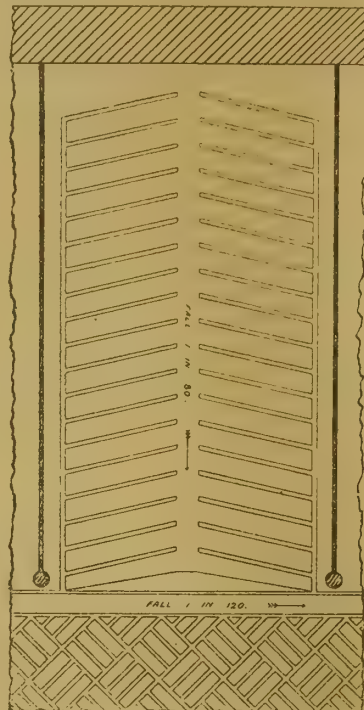


Fig. 93.

channels altogether, and so obtain increased strength of material at the centre of the stall floor. The paving is laid so as to slope slightly from the centre towards the sides, the grooves falling into a small longitudinal channel at each side. In order that the general slope of the stall paving may be as small as possible, the transverse grooves are made very shallow at the highest

showing the form of main channel generally used. In both cases the width of the main channel is 6½ in., with a total depth of 1½ in. On each side a splayed rebate about ½ in. deep is formed to receive the various grooves from the stalls and gangways.

In better class stables, where the unsightliness



Fig. 94.

of a large open main channel would be considered objectionable, and where a certain amount of care and cleanliness can also be insured, a very satisfactory arrangement may be obtained by covering the main channel with a perforated movable cast or wrought iron cover, the whole of the surface



Fig. 95.

channels within the stalls or loose boxes being at the same time left open (see Figs. 42 and 47). The section of main channel suitable for such a purpose is shown in Fig. 97, the upper surface of the movable grating being placed about ½ in. below the floor surface, so as to allow the grooves

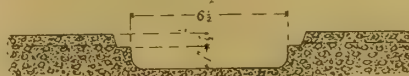


Fig. 96.

of the stalls and gangway to discharge over it. Where covered main channels are used in connection with brickpaving, it is usual to construct both the cover and channel of cast or wrought iron, as shown in Figs. 98 and 99. When the stalls are drained by means of open shallow channels, as seen in Figs. 74, 85, 86, 88, and 89; the grating of the main channel should be fixed at a slightly lower level than the general floor



Fig. 97.

arranged with a certain definite fall towards the gully outside the building. Iron channels fitted with a movable grating may, however, be obtained, in which the necessary fall is provided in the gutter itself, the depth of the channel being gradually increased towards the outfall, so that the cover and the adjacent surface of the floor remains level throughout; they are made in 2ft.,



Fig. 98.

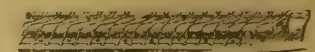


Fig. 99.

4ft., and 6ft. lengths with a fall of 1 in 120 (1in. in 10ft.) Fig. 101 shows an iron channel, having a depth of 3in. and 3½in. respectively at its upper and lower ends, thus giving a difference of level on the invert of ½ in. in a length of 6ft.

In some instances the owners of horses require that the channels of the stalls and loose-boxes, as well as the main channels, shall be provided with a perforated cover, as indicated in Fig. 45. By this means it is considered that the floor approximates more nearly to a plane surface and that a slight saving of straw results, inasmuch that the portion over the covered channel does not become fouled by the liquids flowing beneath as in the



Fig. 100.

case of an open channel; if desired, the stall channel, as well as the main channel, may be formed with covered iron gutters having a self-contained fall on the invert, so that a practically level floor is obtained.

Wherever covered channels are adopted the gratings should be frequently taken up, so that both the channel and cover may be thoroughly cleansed. It is an excellent plan to provide



Fig. 101.

facilities for flushing the entire length of main channel at stated intervals, either by hand or by means of an automatic flushing cistern. Such an arrangement is indicated in Figs. 42, 43, 44, 45, and 47. When covered channels are used for the stalls they may be continued the full length of the stall, and provided with a flushing pipe at the head of each channel; it should, however, be borne in mind that these flushing arrangements should only be considered as supplementing, and not taking the place of, the frequent removal of the channel grating for the thorough cleansing of the whole by hand.

The gradients that may be given to the floors of stables, in order that the surface may be properly drained, will depend in some degree on the nature of the paving material employed; for instance, a smooth, impervious surface of well-

level, and gradually deepening as they reach the stall channel. This last form of grooving is, however, but little used, the methods usually adopted being those shown in Figs. 91 and 92.

The indentations or grooves in a concrete floor should be of a shallow, saucer-shaped section, as indicated in Fig. 94, about 1½ in. wide and ½ in.



Fig. 103.

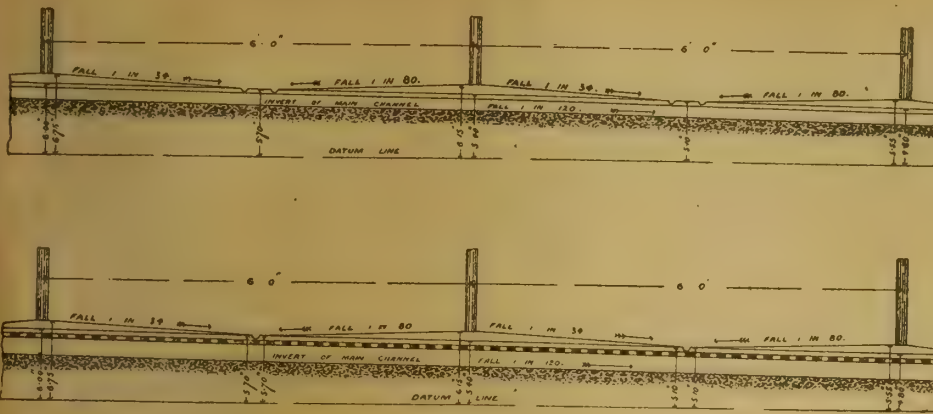


Fig. 102.

laid concrete would be well drained by a much less fall than would be found necessary for a floor formed with wood blocks.

In all cases, whatever the material used, it is desirable that stable floors should be formed with as little fall as possible, consistent with the provision of an efficient draining surface. It will be readily understood that horses rest much better, and are altogether more comfortable, when standing or lying on a comparatively level plane than on a steep slope. Where they are compelled to stand for any length of time upon the floors of stalls which are laid with excessive gradients from front to rear a painful strain is brought to bear upon the hind quarters of the animals, so that they will frequently be found endeavouring

1 in 80 as before, whilst both sides of the stalls would be arranged with a fall of 1 in 80 towards the central grooves. The invert of the main channel has a fall of 1 in 120, the top being placed perfectly level.

#### BOOKS RECEIVED.

*An Architectural Account of the Churches of Shropshire*, by D. H. S. CRANAGE, M.A., F.S.A. (Wellington: Hobson and Co.)—Part 3 of this work maintains the excellence of the examples described and illustrated. The work is illustrated with permanent reproductions taken directly from photographs specially taken by Mr. Martin J. Harding, ex-president of the Shropshire

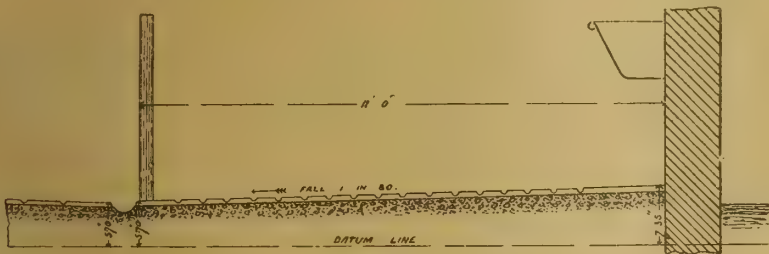


Fig. 104.

to stand diagonally or at right angles to the slope in order to obtain some relief; satisfactory results will, however, generally be obtained by arranging the stall floors to be laid with a total fall from front to back of  $1\frac{1}{2}$  in. to  $2\frac{1}{2}$  in.

Gradients which do not exceed the amount of fall mentioned are practically inappreciable for horses standing or lying upon them, and will be found to occasion no inconvenience; at the same time, sufficient fall is thereby obtained in the length of the stall to admit of the proper drainage of any material having a fairly smooth and non-absorbent surface.

For stalls and loose-boxes paved with brick or granite a fall of 1 in 60 (1 in. in 5 ft.) is considered sufficient; in a stall 10 ft. long this would represent a difference in level between front and back of 2 in. A slope of 1 in 80 ( $1\frac{1}{2}$  in. in 10 ft.) will usually prove ample for stalls having concrete floors. With regard to the main channel at the rear of the stalls and loose-boxes this should have a fall of not less than 1 in 120, or 1 in. in 10 ft.

Figs. 102 and 103 are longitudinal sections through the main channel of a concrete floor for two stalls, and showing the general disposition of the gradients and central stall grooves as indicated on plan in Figs. 91 and 92 respectively; the main channel in Fig. 102 is also provided with a movable perforated cover. A longitudinal section through one of the central stall channels is also shown in Fig. 104.

In the foregoing illustrations it will be noticed that the concrete floor has a fall of 1 in 80 ( $1\frac{1}{2}$  in. in 10 ft.) from front to back, and the main channel a fall of 1 in 120. One side of the stalls is given a fall of 1 in 80, whilst the opposite side has a fall of 1 in 34, so as to make an allowance for the general slope of the stable floor in the direction of the main channel; on the other hand, should the covered main channel at the rear of the stalls be arranged with a self-contained fall as in Fig. 105, the gradient from front to back of stall would be

steel beams to spread the bearing, first used in Chicago, the natural water level, and the necessity of boring to find it, the soft strata, its lateral escape under pressure, &c. In this city  $1\frac{1}{2}$  to 2 tons per square foot has been considered a safe load. In New York the steel grillages are often laid directly in the rock, to avoid occupying valuable cellar space, with large pedestals of masonry. The author also notices the use of caissons, as in the Manhattan Life Building, New York, and illustrates several kinds; also methods of shoring and sheathing used at the Standard Oil Building, &c. Other papers on Railroad Construction, Logging in the North-Western States are given.

#### CHIPS.

The St. Pancras Vestry have decided to pave the sides of the roadway in Gray's Inn-road with Jarrah blocks, at an estimated cost of £7,000.

The urban district council of Alton are applying to the Local Government Board for power to borrow £13,229 for works of sewerage.

A meeting of the Folkestone Racecourse Company was held last week. The chairman read the report of the architect, Mr. R. Pope, who stated that the work on the course was making progress. He had gone into the question of stalls, boxes, boys' rooms, stands, &c., and would shortly submit plans for their erection.

The arsenic burning flues and houses at Poldice, near St. Day, Cornwall, have recently been acquired for the Anglo-Peninsular Chemical Company, Fenchurch-street, London; and on Thursday in last week the managing director of the company laid the corner-stone of the new calcining and refining house. It is intended to spend about £2,000 in building. Mr. Joseph Allen, of Carharrack, is the contractor.

Mr. Joseph Smith, a well-known surveyor and valuer, of Bradford, died very suddenly at his residence, Heaton-grove, Bradford, last week.

The city council of Bath have resolved to appropriate the land between the Technical Schools and New Market-row as the site of an art gallery and the Guildhall Library, to be erected to commemorate the Queen's Diamond Jubilee, and undertook to maintain the same when erected. About £2,600 has been subscribed in addition to £3,000 received from the Roxburgh Fund. At a meeting of the committee, held on Tuesday, it was decided that only architects practising in Bath be allowed to compete for the building, and that Mr. J. McKean Brydon, of London, the architect of the Technical Schools, be asked to act as assessor, a proposal to throw the competition open to all the world being rejected by 19 votes to 12.

Colonel W. L. Coke, C.E., has held a Local Government Board inquiry at Hornchurch, Essex, into the application of the Romford Rural District Council for leave to borrow £3,000 for works of sewerage and sewage disposal in North-West Hornchurch.

The Highland Railway Company are engaged in pushing forward the first instalment of operations for the doubling of the line from Stanley to Aviemore. A large number of men are at present at work, half-way between Newtonmore and Dalwhinnie, constructing a loop line, three-quarters of a mile in length. Between the two stations the distance is about 11 miles, and in this length of line there is a climb of nearly 500 ft. The advantages of a crossing-place midway is therefore obvious.

A new scheme has been sanctioned by the Corporation of Aberdeen for increasing the capacity of the electricity mains to the extent of 20,000 lamps. The extension, which has been adopted on the recommendation of Prof. Alex. B. W. Kennedy, F.R.S., will cost £3,754.

The Works Committee of the Edinburgh and District Water Trust have had under notice the position of Mr. Coyne, C.E., superintendent of works, and they have now come to the conclusion that, owing to failing health, he is no longer able to efficiently discharge the duties of his office. They have therefore recommended to the Trustees that he should be retired from office as at 15th May next, and that, in consideration of his long and faithful services, he be granted an allowance of £200 per annum. The committee further recommend that Mr. William Black, who has given entire satisfaction in the management of the filtration works at Alnwickhill, and who has acted as clerk of works, be appointed to the vacancy thus created at a salary of £500 per annum. Mr. Coyne was appointed superintendent in the beginning of the year 1872, being selected out of forty candidates. The salary on his appointment was £210, which was raised to £400 and eventually to £500. The report and recommendations have been adopted by the Water Trustees.

Camera Club, medallist, &c., and the plans are well drawn by W. Arthur Webb, A.R.I.B.A., &c. The author, who is lecturer on architecture to the local examinations and lecture syndicate of the University of Cambridge, has described each of these interesting churches of Shropshire. Amongst those described is the interesting cruciform church at Wistanstow; St. Giles at Barrow, a pre-Conquest example, partially restored by Mr. Street. The question of date is rather uncertain. The oldest part or chancel probably goes back to the 9th or 10th century, and early Saxon and Norman work remain. Eaton-under-Heywood is interesting, and has a very fine flat carved chancel roof of rich Perpendicular character. The pulpit is Carolian, with canopy over it, dated 1670, and the pews have Jacobean carving. Hughley Church is also interesting for its woodwork and fine screen; the roof is a good specimen of a trussed rafter roof with seven cants. The churches at Shipton, Little and Much Wenlock—the latter a fine church, with long nave, 80 ft. long and 24 ft. wide, south aisle, chancel, and west tower and spire, Norman with Late Gothic insertions—are well worthy of attentive study. Those interested in old churches of a special local type will find much in Mr. Cranage's work to admire.

—The *Engineering Magazine* for April (London: George Tucker, Salisbury-court, Fleet-street), contains an article by CHARLES SOOYSMITH on "Foundation Construction for Tall Buildings," in which several bold problems are discussed. The author illustrates his subject by several photo-process blocks, showing, amongst others, the deep foundation for the Cathedral of St. John the Divine. The views given show the foundation rock excavation 55 ft. below the surface preparatory to laying the concrete, the concrete base 20 ft. thick to carry one of the four great tower piers. The author describes the Chicago and New York practice in laying foundations, the use of



## Building Intelligence.

**ST. PAUL'S CATHEDRAL DECORATION.**—The mosaic decoration of the choir of St. Paul's Cathedral, from the designs of Mr. W. B. Richmond, R.A., will be completed by Messrs. Powell's workmen by Easter. Afterwards work on the quarter domes will be commenced. The decoration of the choir has occupied six years. None but British workmen have been employed, and Mr. Richmond personally trained them in the early methods of laying the tesserae—small cubes of smalto or opaque glass, in some thirty different colours. During the period named, the decoration committee have replaced the Portland stone of the fluted pilasters with green serpentine and with Pavonazzo marble. In the apse, the space behind the reredos has been restored, redecorated, and named the Jesus Chapel. In it has been placed the recumbent monument to Dr. Liddon, for twenty years canon of the Cathedral. The three easternmost windows have been filled with stained glass from the designs of Mr. Kempe.

**STAFFORD.**—The handsome block of new buildings in connection with the Staffordshire General Infirmary will be opened on Wednesday next by the Countess of Lichfield. The work of restoration and enlargement has been carried out at a cost of about £20,000, from plans by Mr. Aston Webb, of Queen Anne's-gate, S.W. Before the alterations the infirmary consisted of a single block of buildings, with a central corridor and rooms used as wards opening out of it on both sides—a very usual arrangement 50 to 70 years ago, but making the central corridor dark and preventing any proper cross ventilation to the wards. At the south end of this central block was a wing used for fever patients. The sanitary arrangements throughout and the nurses' accommodation were most defective. It was decided to pull down all the old buildings with the exception of the central portion, and to devote this to administrative purposes, nurses and servants' accommodation. The provision for patients has therefore been entirely rebuilt, and is disconnected by open corridors from the administrative block, and in two pavilions to the north and south, making an elevation towards the high road of 370ft. in length. The patients are provided for in four large wards, facing east and west, containing 14 beds each, a children's ward of 12 beds, three isolation wards of two beds each, three isolation wards of one bed, and two day-rooms, making a total of 80 beds. Detached sanitary blocks are provided at the ends of the large wards, and the whole are built on arches, so that there is a complete circulation of air round them. Attached to the north block is a new operating theatre, served with a patients' lift and with a preparation-room adjoining. Each block is reached by a stone staircase, and at the further end is an external escape in case of fire. The out-patients' department, with its dispensary, consultation, and examination rooms, is placed under a portion of the south block, and a mortuary and post-mortem room have been arranged in the grounds. In the centre block are the kitchens, doctors', nurses', and servants' dining-rooms. On the ground-floor are situate entrance and board-room, receiving-room for patients, doctors', and matrons' rooms, while on the first floor are nurses' cubicles and sisters' and nurses' sitting-rooms, and on the floor over, servants' bedrooms. The building is heated throughout with hot-water radiators, the large wards having a combination of an open stove and hot water, the fresh air supply to these wards being drawn from the outside and warmed before its entry into the wards by passing through these radiators. The air is extracted by means of flues in the walls, collected in flues in the roof, and finished with Kite's extract ventilators. The walls of the wards have all their corners rounded and finished in Keene's cement and painted. The floors are laid in polished oak. Externally, the walls generally have been faced with rough-cast, partly for the sake of warmth and partly as an easy means of making the old central block harmonise with the new, red-brick facings being employed round the window and door openings. A new central porch has also been erected, and the external appearance has been further improved by the erection of a new boundary wall and entrance gates towards the road. The work has been carried out in two contracts, the first being the north wing, which was built by Mr. Espley, of Stafford; the second, including the south wing, the isolation and children's wards, and the remodelling of the

central block, being carried out by Mr. J. Gething, of Shrewsbury. Mr. Peabworth and Mr. Tanner have acted as clerks of works.

**THIRSK.**—The work of restoring the exterior of St. Mary's parish church will be commenced next week. In 1876 and 1877 the interior was restored and restalied, and the anticipated work is to cost at the lowest estimate £1,200. Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect. The church had been previously restored internally from the design of the late Mr. G. E. Street, R.A., but from want of funds the work was stopped before the remarkably fine south porch and the external stonework generally were in any way repaired. In 1886 an effort was made to raise the necessary funds for the restoration of the porch. The work embraced a new stone staircase to the parvise, oak ceiling to the porch, the re-leading and repairing the old oak roof, the removal of whitewash, the execution of general repairs to the stonework, and the fitting the parvise up as a clergy vestry, the church being at that time without one. The sum of £300 was soon raised, and the work accomplished. Since then little has been done either externally or internally at the church. The sum already promised towards the present restoration is £850.

A new Unionist clubhouse has been opened in Catherine-street, South Shields, from designs by Mr. J. H. Morton, of the same town. It is five stories in height, and has a frontage of 40ft., and a depth of 55ft. On the first and second floors are rooms each 43ft. by 40ft., the one used as a billiard-room, the other as an assembly-hall.

Mr. Willocks, Local Government Board inspector, held an inquiry at Leigh, Lancs, recently, concerning the urban district council's scheme to build ten houses for workpeople displaced by important street improvements, estimated to cost upwards of £100,000. It was stated that the population of Leigh was 36,000, assessable value £112,000, and the present indebtedness of the council £33,000, exclusive of extensive gas and water undertakings.

A proposal has been mooted at Hull for building an Art Gallery for that town, which is singularly lacking in attractive features. It is pointed out that Leeds possesses one of the largest galleries in the provinces, it cost only £12,327, and is self-supporting. Hull is said to be the one great borough in the kingdom which has absolutely no provision for the gratification of the love of the beautiful.

At a cost of £21,000, the G.E.R. Company are constructing four miles and a half of heavy goods line, though technically known as a "light railway," from a point of their system between Whitlesey and March, called the Three Horseshoes Siding, to Benwick, where it ends in docks at the side of the River Nene. By its means it taps the traffic, by water and light railway carriage, of over 11,000 acres of root and cereal-growing land of Cambridgeshire and Huntingdonshire. The construction of the line, which is absolutely level, is under the general superintendence of the head engineer, Mr. Jno. Wilson, and the active direction of Mr. Sherlock, district engineer, under whom is Mr. Wilson, jun. It is expected to be complete in September.

The National Schools, Tregarth, North Wales, are being warmed and ventilated by means of Shorland's patent Manchester stoves and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Western Branch of the Sanitary Inspectors' Association, which met in Bristol last year, will pay a visit to Weston-super-Mare on Saturday in next week. The delegates will be received by members of the town council, and during the discussion prominence will be given to the claims of Weston-super-Mare as a health resort. The sanitary works of the town will be described, and visits will be paid to places of interest in the locality.

Five of the freehold estates forming assets of the Liberator group of companies will be sold by auction at the end of May. The approximate value of the whole is upwards of a quarter of a million sterling. The estates are at Tilbury, Chingford, Norbury, Romford, and Clapham, and comprise, besides extensive areas of building land, a very large number of houses. The feature of this realisation is that the estates are each to be offered in one lot, so that syndicates and large capitalists will have an opportunity for wholesale investment.

The new Welsh church dedicated to St. David, and the mission buildings in connection therewith, which have just been erected in St. Mary's-terrace, Paddington Green, have been opened for worship. The cost of the work was £3,700. The church, which has been erected under the supervision of Mr. C. Evans Vaughan, F.R.I.B.A., has accommodation to seat 400 persons.

## Engineering Notes.

**THE RIVAL WEST END ELECTRIC RAILWAY SCHEMES.**—The Select Committee of the House of Commons gave its decision on Friday on the City and West-end Railway Bill and the Brompton and Piccadilly-circus Railway Bill. They are both schemes for the construction of underground electric railways—in the one case from Cannon-street in the City to Hammersmith, with frequent stations, and in the other case from Piccadilly-circus, by way of Piccadilly and Hyde Park Corner, to Brompton-road. The committee heard a great many witnesses for and against the Bills, and they have decided that the preamble of the Brompton and Piccadilly Bill is proved, and reject the City and West-end Bill. They have also heard evidence with respect to the deep level scheme of the Metropolitan District Railway Company between Earl's-court and the Mansion House, but the further consideration of this Bill is adjourned until after Easter.

### CHIPS.

The new board schools, Loughborough, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The South Shore Hotel at Blackpool is about to be rebuilt and enlarged from plans by Mr. R. B. Mather, of that town. The front elevation to Queen-street will be raised two stories, and will be of Ruabon brick with stone dressings, and at the rear will be a new wing.

It is reported that up to the present the amount expended by the Newport, Mon., Corporation on the making of the new waterworks at Wentwood is £88,360 19s. 6d.

The order of the Local Government Board, sanctioning the carrying out of the scheme recently adopted by the Heath Town Urban District Council for the sewerage of the district, has been received. The amount to be expended is about £14,000.

Thurgood and Martin have sold by auction, at the Mart, the freehold of No. 16, Old Bond-street, with a ground area of 2,590ft., let until 1901 at £300 per annum. The price realised was £30,100.

In the Colne Town-hall, a Local Government Board inquiry was held on Friday before Colonel March, one of the Local Government Board inspectors, into an application to borrow £25,000. The town clerk (Mr. A. Varley) stated that of this amount £11,000 was required for street improvements, £7,000 for sewerage and sewage disposal, £4,500 for erection of markets, £1,600 for construction of public works and recreation-ground, and £950 for purchase of steam road-roller and shed.

A new organ, which has been built by Messrs. Abbott and Smith, of Leeds, for Silverdale Church, has been formally dedicated by the Ven. Archdeacon Clarke. The instrument consists of two complete manuals on the Walker system, with tubular pneumatic pedals. There are 19 stops and 863 pipes.

A peal of eight bells is being hung in the tower of St. James's parish church, Thrapston, and will be inaugurated on May 6. Messrs. John Taylor and Co., of Loughborough, are the founders.

At Edinburgh University on Saturday the honorary degree was conferred on Mr. James Gairdner, M.A., late Assistant Keeper of the Public Record Office, London, who was described by Sir Ludovic Grant as "the foremost living historian of Scottish extraction and education."

At the last meeting of the town council of Stockport, on a motion to let further contracts in connection with the sewerage scheme, objection was made by several members to a clause in the contracts constituting the engineer of the sewerage scheme (Mr. A. M. Fowler) sole arbitrator in case of disputes between the corporation and the contractors. Mr. Gilbert Burrows stated that on the contracts previously let there had been allowed not less than £27,430 18s. 4d. for extras, additions, and contingencies. After a long discussion it was decided unanimously that any disputes hereafter arising should be referred to the deputy mayor, the borough surveyor, and the engineer of the sewerage scheme.

After a two-days' hearing, the jury at the London Sheriff's Court has awarded £2,313 as compensation to Mr. Edward Chitty, flour merchant and miller, of Debnam's-row, Bermondsey, for the compulsory acquisition of his premises by the South-Eastern Railway Company, in connection with the widening of their line.



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## ILLUSTRATIONS.

THE RING CHURCH, WIESBADEN.—GRAMMAR SCHOOL, WISBECH.—DESIGNS BY STUDENTS OF THE MANCHESTER SCHOOL OF ART.—ST. SAVIOUR'S, SOUTHWARK.—STABLES AT BICKLEY HALL.—HOUSE AT BUXTON.—NEW PREMISES, BLACKFRIARS ROAD, S.E.

## Our Illustrations.

THE RING KIRCHE, WIESBADEN.

PROF. OTZEN'S work is never hampered by anything approaching the limitations so often self-imposed by those whose designs are based upon precedent. Whatever merits or failings are discoverable in this distinguished German architect's productions, at any rate his conceptions are thoroughly modern, and certainly they are always interesting and clever. The present examples of his ecclesiastical work, illustrated by us to-day, differs from his North German brick and glazed faience churches in several particulars, and chiefly by reason of its ashlar facings; but its plan on the auditorium principle is its distinguishing characteristic—the pulpit occupying the post of honour under a gabled canopy at the entrance to the apse where the organ is located. As a preaching place it would be difficult to scheme a more suitable arrangement, the choir being accommodated in a gallery facing the audience, ranged as in a theatre round the performers. The exits and entrances are ample, and separate doors lead to the galleries. Water-closets are provided for the convenience of the seat-holders. Externally, the building bespeaks its purpose in a very distinctive manner. The Communion-table occupies a position common in this country in Nonconformist buildings, in front of the pulpit. Figure-statuary is freely used in the decoration of the building, which is also elaborated with mosaics and stained glass. Herr Ernst Wasmuth, the enterprising architectural publisher, of Markgrafenstrasse, Berlin, is publishing a beautifully-produced monograph of Prof. Otzen's churches, and our present illustrations, reproduced by permission from this folio work, will give our readers a good idea of the value and interest associated with so replete a collection of executed designs of the first consequence in this way.

WISBECH GRAMMAR SCHOOL.

THIS building, of which Mr. Wm. M. Fawcett, M.A., of Cambridge, is the architect, comprises a considerable extension of the old premises seen to the left of the accompanying picture, and, as the plan shows, the additions comprise a large schoolroom, with classrooms and a big dining-room adapted for the uses of a high-class academy. The façades are in red brick. We have no further particulars.

DESIGNS BY STUDENTS OF THE MANCHESTER SCHOOL OF ART.

WE give this week a series of very interesting designs for ironwork and embroidery by students of the Manchester Municipal School of Art, produced under the direction of Mr. Walter Crane. The drawings speak for themselves, and are well worthy of study.

## INTERIOR OF NAVE, ST. SAVIOUR'S CHURCH, SOUTHWARK.

THIS interior perspective, drawn by the architect, illustrates the new nave opened a few weeks ago. We gave Sir Arthur Blomfield's drawing of the exterior of the church with the geometrical elevations and plan on Feb. 19 last, and a sketch of the new transept appeared in the BUILDING NEWS for March 19. We also printed several particulars concerning the history of the fabric and an account of the work just now completed; so there is nothing more to add on the present occasion save to express our indebtedness to Sir Arthur Blomfield and Sons for the loan of these admirable drawings for illustration.

## STABLES AT BICKLEY HALL.

BICKLEY HALL stables, of which we give two views and the plans, were built a few years ago by Messrs. J. C. Arnaud and Son, of Bromley. The materials are red brick and tiles. The architect was Mr. Ernest Newton. The photographs here reproduced were shown at the recent Arts and Crafts Exhibition.

## HOUSE, BUXTON.

THIS house has recently been erected for Mr. William Perry, architect, Spring-gardens, Buxton, and, in addition to the accommodation shown on the plans, there are four cellars in the basement, which were excavated out of the limestone rock. All outside walling is finished with parpoints, and the architect has paid special attention to the ventilation of each room and staircase, and also plenty of window-light. The cellar windows are kept well above ground level. An additional feature of the planning is the arrangement of close proximity of the kitchen to the dining-room, which is a great convenience to the "working" of the house, and at the same time giving the required privacy to the dining-room. All the rooms on the chamber and attic floors are entered direct from the landing, thus doing away with any necessity for corridors or passages. As an architect's residence this house has a special interest of its own, and, as a practical example of house-building, the working plans are useful.

The Duke of Cambridge unveiled at the Royal Hospital, Chelsea, on Saturday, a tablet to the memory of the late Field Marshal Sir Patrick Grant, who, for a long period, was the Governor of that institution. The memorial, which has been placed in the corridor south of the hospital chapel, has inscribed on it a record of the many actions in which the distinguished soldier took part. The tablet has been executed by Mr. Francis Verhynden, and is a replica of one placed in the crypt of St. Paul's Cathedral.

The Rev. Canon S. A. Barnett appeals for £13,000, the balance of a sum of about £20,000 still needed to provide and endow a permanent picture gallery for Whitechapel. The Easter loan exhibition at the Toynbee Institute, arranged by Canon Barnett, was opened on Wednesday, and will be on view free every day until Monday, May 3. It is fully up to the usual high average, a special feature this year being a large collection of Mr. Watts's pictures.

The corner-stone of the new chancel of Croyland Abbey was laid on Thursday in last week. The work now in progress is carried on as nearly as possible on the lines of the old work. The new chancel is simply the removal of the recently erected east end to the next bay or to the original western arch of the north transept. By this addition the unique Norman arch of the nave will be greatly strengthened. About £1,500 is needed for the preservation of the Abbey.

On Friday Lieut.-Col. Albert C. Smith, R.E., Inspector of the Local Government Board, held an inquiry at the Town Hall, Ipswich, in reference to two applications by the town council for approval of loans. One was a loan of £7,000 for sewerage purposes, and the other a loan of £5,870 for wood pavement. The town clerk, Mr. W. Bantoft, and the borough surveyor, Mr. E. Buckham, gave evidence in support of the application.

Mr. W. J. Weale, the keeper of the National Art Library at South Kensington, whose retirement under the age clause was expected to take place this month, has received an extension of his term of office, pending the report of the Select Committee appointed by the House of Commons to inquire into the administration of the Science and Art Department.

The Waterloo-with-Seaforth Urban District Council had before them on Friday evening plans for a proposed marine promenade, estimated to cost £16,152 lrs.

## COMPETITIONS.

COLCHESTER.—At the last meeting of the corporation, a report was received from the municipal offices (special) committee, who stated that they had resolved to invite Messrs. E. W. Mountford, B. Binyon (Ipswich), H. T. Hare, J. Belcher, J. M. Brydon, and Beresford Pite to prepare and submit competitive designs and estimates, and in event of one of them declining, to invite Mr. Burgess, of London. Mr. A. Waterhouse, R.A., having declined to act as assessor at a fee of 50 guineas, Mr. Norman Shaw, R.A., had accepted. It had been resolved unanimously to leave it open to architects practising in and being ratepayers of Colchester also to submit designs. Messrs. Binyon, Pite, Belcher, and Brydon had accepted the invitation; Mr. Mountford conditionally to the travelling expenses of the successful architect being paid and the time for drawings extended to June or July; and Mr. Hare had promised to send plans, but trusted the time might be extended to the end of June. The committee therefore resolved that the travelling expenses of the successful architect be allowed, in addition to commission, and that the time be extended to June 30. The report was after some discussion adopted.

## CHIPS.

Colonel Stanley G. Bird, a past president of the Central Master Builders' Association, who has been in command of the Victoria and St. George's Rifles (1st Middlesex) for 12 years, and is also one of the oldest officers in the Volunteer Service, has been granted an extension of two years in the command of his corps.

There was during last week a very large amount of property on offer at Tokenhouse-yard, many sales having to be crowded in before the Easter vacation. Gas and water stocks and shares found a ready market, as also did ground-rents; but the chief business was done in the smaller class of brick and mortar investments, which have been growing so much in public favour of late. The total of the week's sales amounted to £156,896.

On Tuesday week a meeting was held at the bankruptcy offices, St. Aldate's, Oxford, of the creditors of Isaac Castle, builder, of 3, Chalfont-road, in that city, and lately residing at 29, Tudor-street, Leicester. The summary of the debtor's statement of affairs showed gross liabilities amounting to £5,560 2s. 1d., and the deficiency is put at £338 13s. 1d. The Official Referee was instructed to act as trustee and wind up the estate, no offer being made by the debtor.

About five years ago the erection of a new Roman Catholic Church was commenced at Ballybunion, the funds being found by Mrs. Young. After the work had been in progress for a year, and the shell had been erected, that lady died, and the work has since been stopped. A meeting was held in the village last week at which it was decided to attempt to make a fresh start; over £100 was promised in the room, and a building committee was appointed.

A public meeting of those interested in the completion of St. Bartholomew's Church, Reading, was convened in the parish hall, on Tuesday evening, to consider the necessary steps to be taken in the direction of carrying out the work. Messrs. Bodley and Garner have prepared plans for a chancel, morning chapel, organ-chamber, and vestry. Sitting accommodation will be provided for about 570 (exclusive of the choir), an increase of 200. The estimated cost of the work is £3,205, divided up as follows: chancel (exclusive of screen), £1,740; chapel, £800; vestry and organ-chamber, £665. The plans were adopted, and a building committee was appointed.

A special meeting of Glasgow Corporation Tramway Committee was held on Friday for the purpose of considering the adoption of a mechanical motor system. The meeting discussed the reports of the various deputations which had visited the Continent and America, as the result of which the adoption of the overhead system of electric traction had been recommended, and, by 16 votes to 4, decided to recommend that an experiment should be made with that system on the Mitchell-street and Springburn route. The distance is about three miles.

The consecration of St. Etheldreda's Church, Fulham, took place last week, the Bishop of London officiating. The portion of the church now consecrated consists of three bays of the nave, with a temporary east-end and choir fittings. There are no aisles, but the buttresses, which project internally, are pierced so as to form narrow side passages. The materials used are red and stock bricks, and stone for dressings. As it was necessary to keep the cost down, consistent with sound building, both exterior and interior are quite simple in design. The entire cost has been under £4,000, and there is accommodation for over 550 people.





WEST ELEVATION



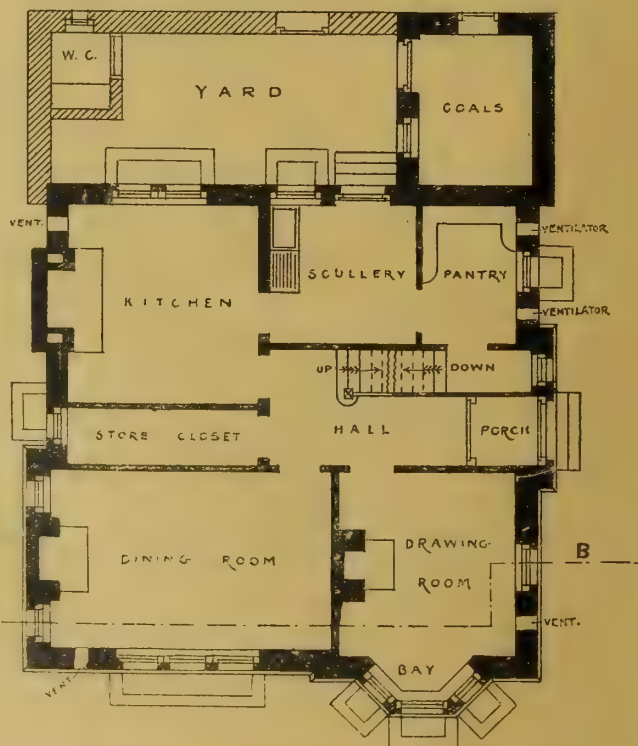
SOUTH ELEVATION



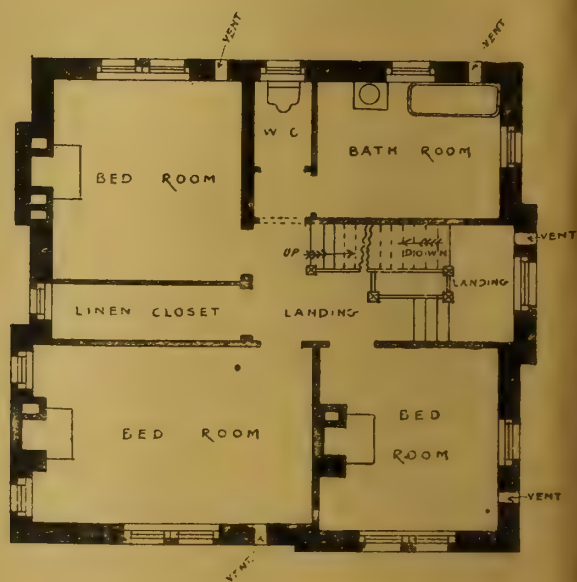
SCALE OF FEET.

HOUSE ERECTED IN

DERB



GROUND PLAN



CHAMBER PLAN





EAST ELEVATION

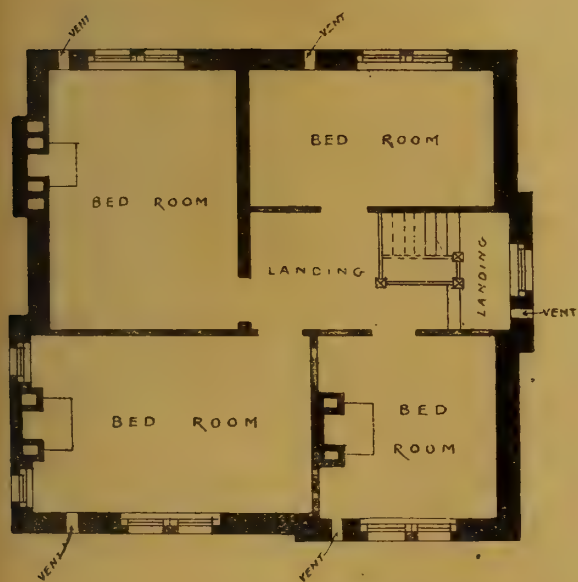


NORTH ELEVATION

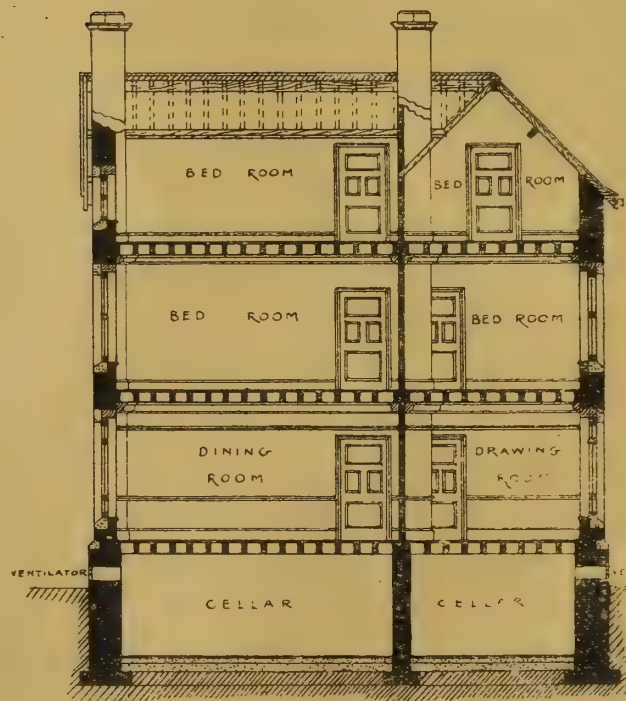
ENCER ROAD, BUXTON

WILLIAM PERRY  
ARCHITECT  
18 SPRING GARDENS  
BUXTON.

HIRE FOR MR. WILLIAM PERRY.



ATTIC PLAN



SECTION ON A.B



## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—Under the leadership of Mr. Hippolyte Blanc, R.S.A., the members of this association on Saturday visited Niddry and Duntarvie Castles. The former, situated in Kirkliston parish, Mr. Blanc described as a fair example of an early keep, one showing the first development from the simple square tower. The doorway in the inner angle enters upon a circular staircase leading to the several floors, now in ruin. The walls average 9ft. thick. The foundation of the tower was ascribed to George, fourth Lord Seton, probably in the last quarter of the 15th century. The castle receives prominence in history as having in 1568 afforded shelter and protection to Queen Mary. During the troublous times of Charles I. and II. the castle and lands passed to the family Hopetoun, the castle giving the title of Baron Niddry to Lord Hopetoun. Duntarvie Castle, situated in Abercorn parish, Mr. Blanc explained, was a residential manor-house of about 100 years later date than Niddry. It presents a large rectangular building, 80ft. long, facing south, with projecting wings at the extremes on the north side. This castle was in marked contrast to Niddry, the walls being so much thinner. There was much evidence to associate the period of foundation with the end of the 16th or beginning of the 17th century. The castle continued habitable until quite recently, and is now in ruin.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—At a meeting of this association held in the rooms, 187, Pitt-street, on Tuesday, the 6th inst., Mr. William Tait Conner, A.R.I.B.A., in the chair, Mr. Wm. Fraser, A.R.I.B.A., read a paper on the "Influence of Economics on Architecture." He showed the bad effect the present land tenure had on architecture; how, especially where leases of a limited period existed, the buildings were built only to last out the lease; how building for profit and not for use tends to depreciate our art, as the great proportion of the buildings in Glasgow are erected by the speculative builder, whose aim is to make a profit and not to erect the best building he can. He showed also how the unequal distribution of wealth, competition, and the sub-division of labour were against the appreciation of good architecture, and unfavourable to thoughtful design and good workmanship. The remedy he suggested was collectivism, which, he said, would give greater opportunities for good architecture, as buildings would only be erected when required and not as profitable speculations. There would be no glaring inequalities in wealth, with the ostentation of riches and the degradation of poverty. The worker would be well fed, and be sure of his work, and could, therefore, take greater delight in it, and produce better work. There would be no need for work being cut down to the cheapest point to make things pay, for buildings would be erected for the good of the community, who would take a delight in seeing their own property beautiful. On the motion of Mr. J. Craigie, a hearty vote of thanks was awarded to the essayist.

**YORK ARCHITECTURAL SOCIETY.**—On Wednesday week the Rev. Canon Argles lectured on "The History and Development of York Minster," before the members of the York Architectural Society, in the Church Institute. The lecture was illustrated with limelight views. Canon Argles sketched the features of the various buildings which preceded the present minster, which, he said, is a standing monument to the piety and devotion of its successive generations of builders, who, in the face of difficulties that would in these days wreck a much smaller undertaking, and in times of great turmoil and unrest, were content to rear their work to the praise and glory of God. Our ancestors steadfastly strove to attain a result which leaves York and Yorkshire in possession of the finest specimen of Gothic ecclesiastical architecture of which any city can boast; for even Cologne Cathedral is too lofty in proportion to its size, and the details of its work are buried in its proportions, the general effect being far less satisfactory. York Minster tells, too, of the continuity of the Anglican Church, of her worship, and of her episcopacy. A vote of thanks was accorded to Canon Argles at the close of his lecture. Mr. A. B. Burrell, the hon. secretary of the society, manipulated the lantern for the views.

The North Pier, Blackpool, has been widened from 24ft. 6in. to 46ft., and will be reopened for the Easter holidays.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., L.I., L.II., L.III., L.IV., L.V., L.VI., L.VII., L.VIII., L.IX., L.X., L.XI., L.XII., L.XIII., L.XIV., L.XV., L.XVI., L.XVII., L.XVIII., L.XIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—G. H. (Manchester).—S. S. G.—L. J.—C. R.—P. H. S. Co.—W. S. and Son.

## "BUILDING NEWS" DESIGNING CLUB.

### SEVENTH LIST OF SUBJECTS.

G.—A group of stable buildings suitable for erection in connection with a gentleman's moderately-sized country house. The accommodation to comprise six stalls and two loose boxes (the latter may be located in an adjacent building to the stall stable), a washing place, harness-room, and a coachhouse for four vehicles. A groom's bedroom must be provided on the first floor, and a loft for provender. A corn-shoot desirable. The carriage-washing space to be outside in front of the coachhouse. Adjoining, and planned to group well with the stables, a cow-byre for five cows is to be provided, with a covered yard, a mixing-room, and a calf-box large enough to be divided into two. A small dairy and churn-room may form part of the buildings, and a hen-house; two earth-closets, one for use near the dairy. Scale 8ft. to inch for elevations. Plans may be smaller. Two elevations, one section, and plans with view. Materials, brick and tiles.

## Intercommunication.

### QUESTIONS.

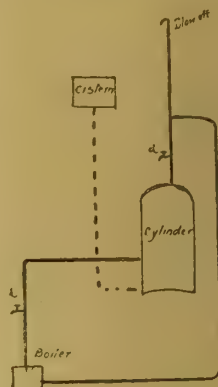
[11649].—**Clerk of Works.**—Whose servant or representative is he?—the architect's or employers, and by whom dismissable?—**QUERY.**

[11650].—**Lunatic Asylums.**—Would any of the readers of the BUILDING NEWS oblige us by giving the numbers of that journal in which articles on Lunatic Asylums are to be found? A series of articles on this subject began, we think, in the summer of 1894, and we have, unfortunately, destroyed all our copies.—**R. B. P., R. U.**

[11651].—**Ecclesiastical Valuations.**—A vicar just instituted to a living asked by his predecessor to buy a hot-house which the latter had erected. I am informed that if the new vicar purchases this hot-house it becomes part of the vicarage, and he cannot sell it to any future incumbent, but is, moreover, liable for dilapidations on it. Is this correct? I thought Gwilt (1836) referred to the point, but I cannot find it.—**J. WIGHAM DOUGLAS.**

[11652].—**Paraffin Polishing.**—What is paraffin polishing (I see it mentioned in the description of the Manchester Royal Infirmary), and would it do for deal floors?—**P. C. G.**

[11653].—**Domestic Hot Water Supply.**—Is there any pressure on the boiler when the water in cylinder on floor over is boiling, so long as the blow-off pipe at the top of cylinder is open? And in carrying the latter above roof, is there anything gained or lost in bending the termination of pipe over so as to discharge steam or hot water on to slates? I shall also be glad to learn if



there is any objection to a hot-water arrangement, as shown by sketch, for the purpose of drawing hot water at any point in the circulation, and doing away with dead branches. Strong dark lines show hot-water piping; dotted lines, cold water; d, taps or water-cocks.—**TOLOP.**

## CHIPS.

Mr. Adam Fyles, builder, Brighton-road, Birkdale, died on Friday, aged 49 years. Deceased, who had been ill for the last few months, was locally a well-known Liberal and Wesleyan, and headed the poll for his ward at the first election of the Birkdale Urban District Council.

Mr. Justice North gave judgment on Saturday in an action, "Durrant v. the Branksome Urban District Council," in which the plaintiffs, the owners of a large estate near Bournemouth, sought an injunction against the defendants, who were alleged, by the construction of certain surface-water sewers, which drained into a natural watercourse flowing through the plaintiffs' property, to have caused deposits of sand and silt. His lordship held that the defendants were acting within their right, and dismissed the action with costs.

The foundation-stone of the new National day schools was laid in Leicester-street, Wolverhampton, on Wednesday week. The schools are intended to provide accommodation for over 600 children, and the total cost will be about £3,400. The architect is Mr. J. H. Lines, and the builder Mr. Cave.

At Friday's meeting of the Stockton Board of Guardians, the Workhouse Accommodation Committee reported that they had secured suitable sites for the four semi-detached cottage homes (or eight houses) which they proposed to build at an estimated cost of £5,000.

At a meeting of the Edinburgh Photographic Society, held on Friday night, Mr. F. P. Moffat, the president, in the chair, Mr. Hippolyte J. Blanc, R.S.A., delivered an address on "Photography as an Aid to the Architect." It was largely owing to the employment of the camera, he said, that the architecture of Great Britain had, in the last fifty years, undergone such rapid changes. The architect shared liberally in the facilities for travel, and by means of the camera there had been brought under his notice excellent representations of what was best in the architecture of other countries. It was chiefly as a means of instruction in itself, and as an education to others, that he ventured to advocate the architect making photography an indispensable study in co-relation to his art.

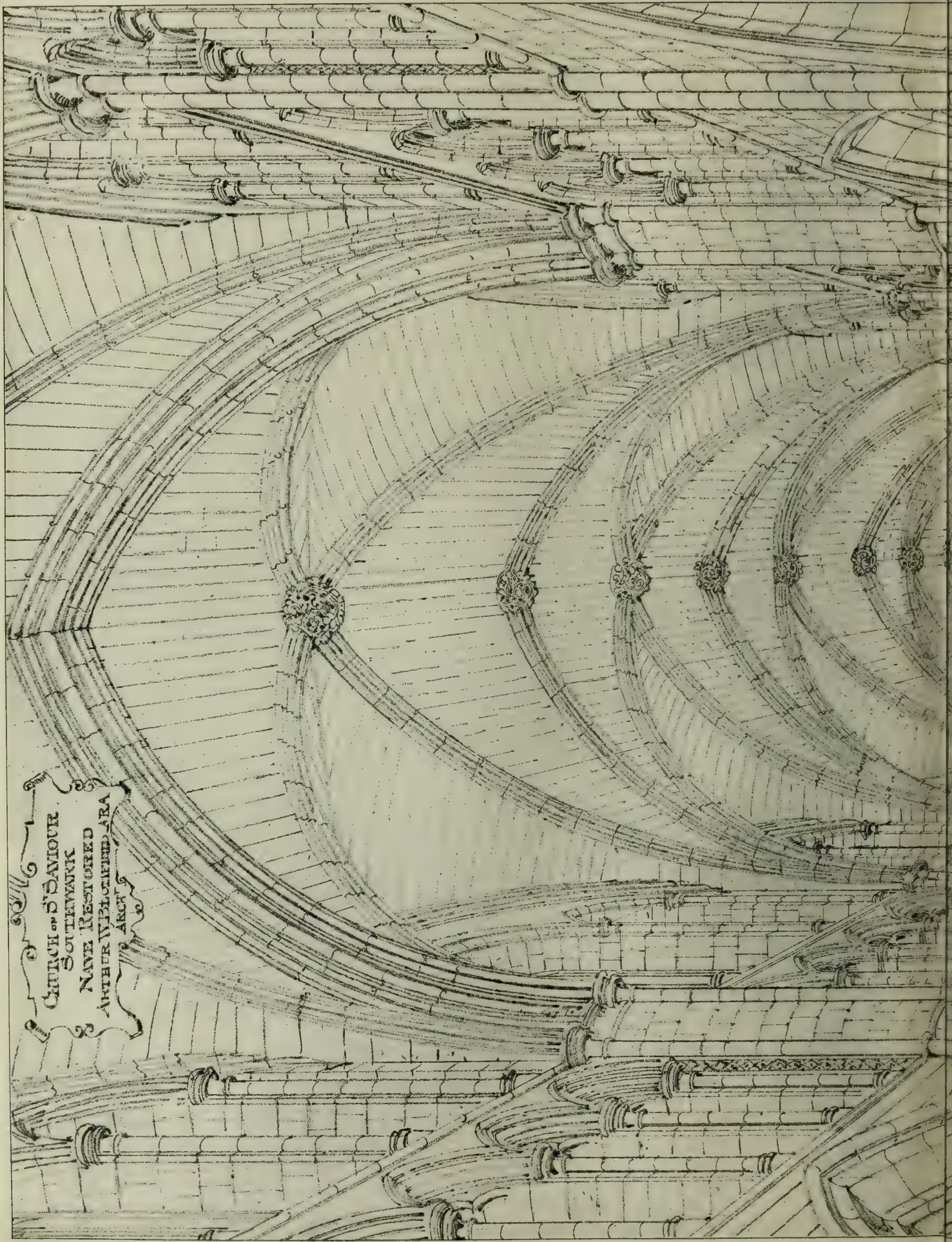
The Lord Chancellor visited Derby on Friday for the purpose of opening the new County Court offices, erected in St. Peter's Churchyard at a cost of £12,000.

The British Museum authorities have generally approved of the project originated by Sir B. Stone, M.P., for establishing an Historical Photographic Record and Survey Department. It will consist of a collection of photographs of historical buildings and places, which will be gathered together from all parts of the kingdom. A nucleus has already been formed in a series of platinotype photographs of the interior of Westminster Abbey, all taken by Sir Benjamin Stone, M.P. These Sir Benjamin has just presented to the Museum. This gift is to be shortly followed by a second series representing the crypt of St. Stephen's Chapel, a corner of the "Aye" lobby, the throne in the House of Lords, the famous frescoes, and various other points of interest, including two or three views of the chamber of the House of Commons itself. The Trustees of the Museum concur in the suggestion that the collection should be under the immediate direction of an organising committee.









CHURCH OF ST. SAVIOUR  
SOUTHWARK  
NAVE RESTORED  
ARTHUR WILKINSON, ARCHT.



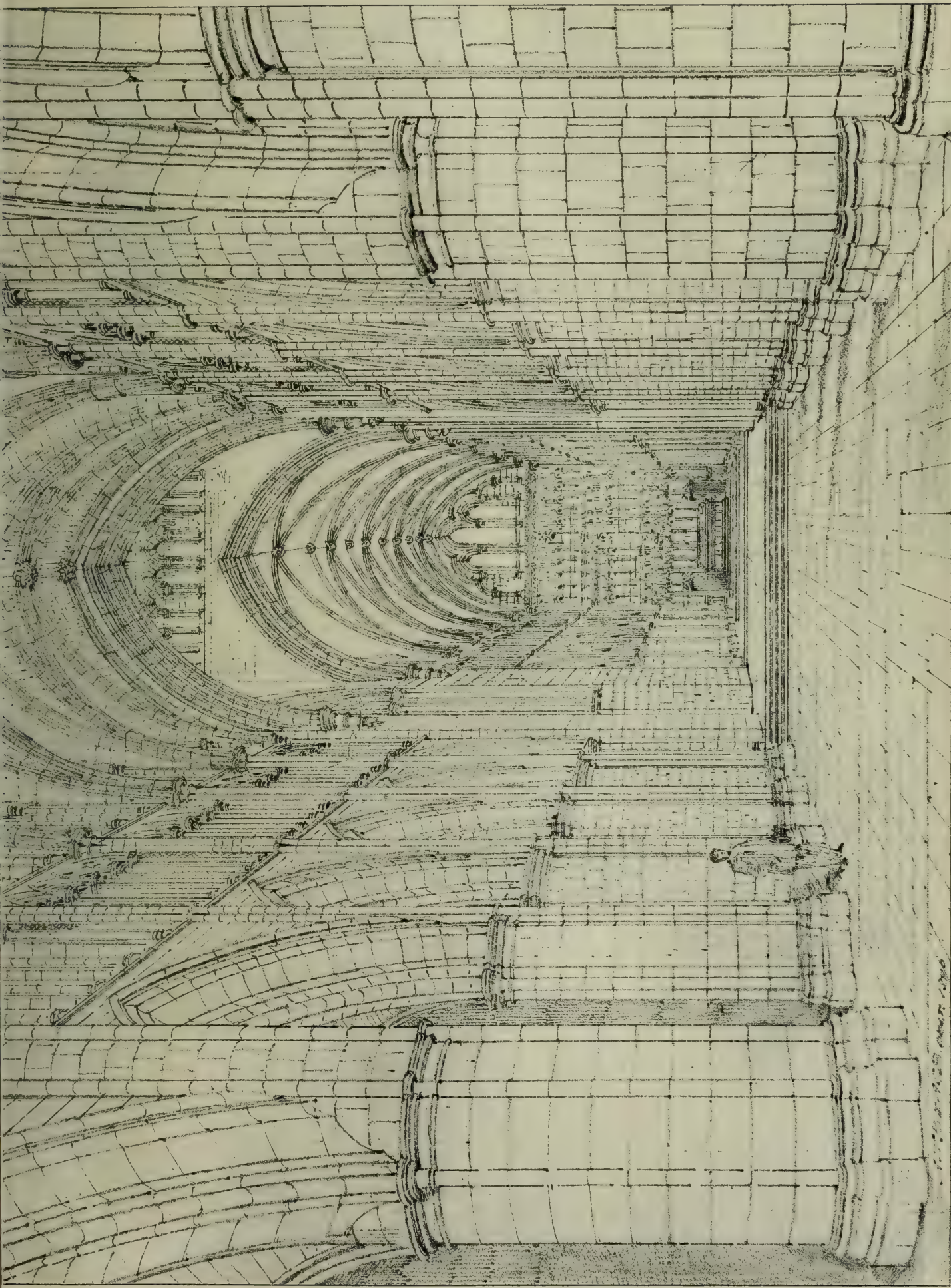


Photo. Taken by James Akerman 6 Queen Square London W.C.

# ST. SAVIOUR'S CATHEDRAL CHURCH SOUTHWARK.

SIR A. BLOMFIELD, ARCHT. & SONS ARCHT'S



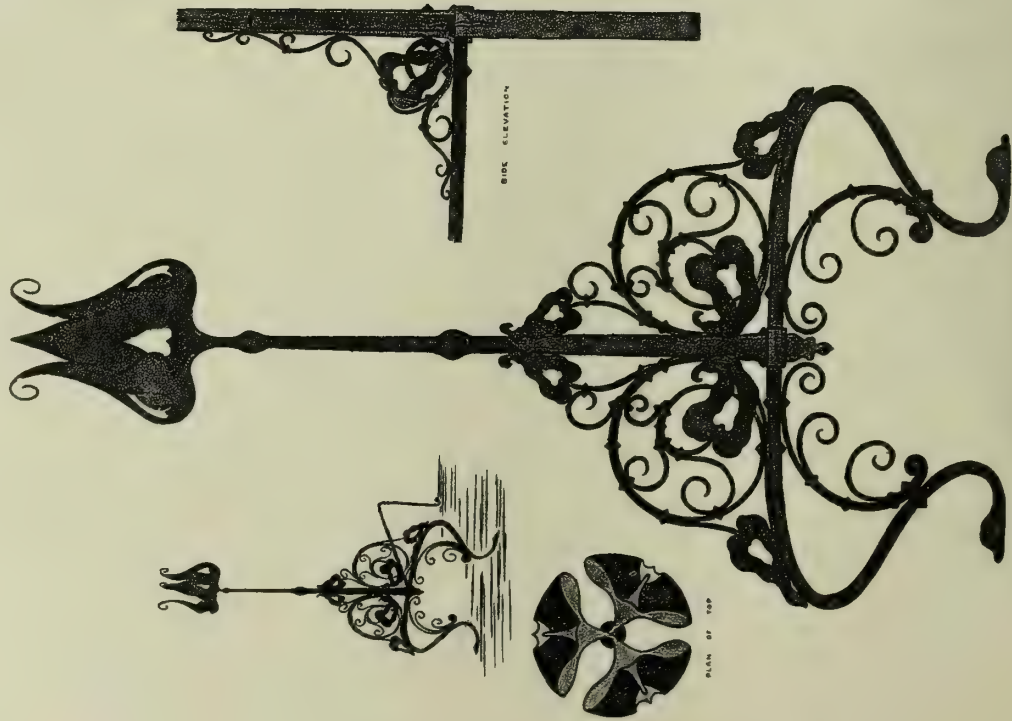






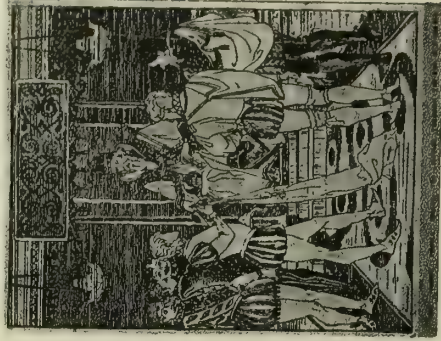
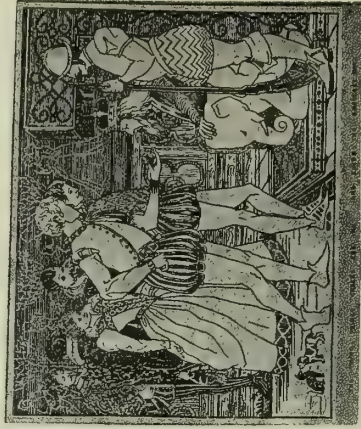
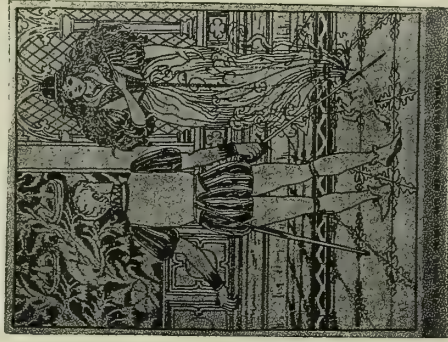


MANCHESTER MUNICIPAL SCHOOL OF ART.

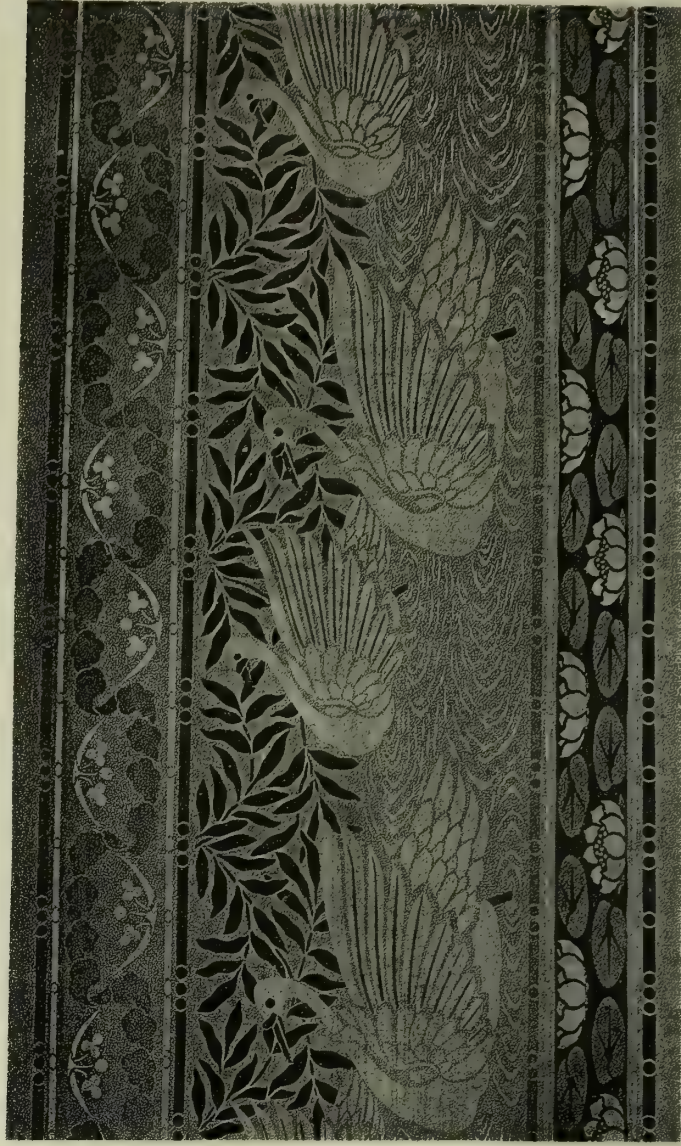


DESIGN FOR FIRE-DOG  
WROUGHT IRON

STUDENTS' DESIGNS



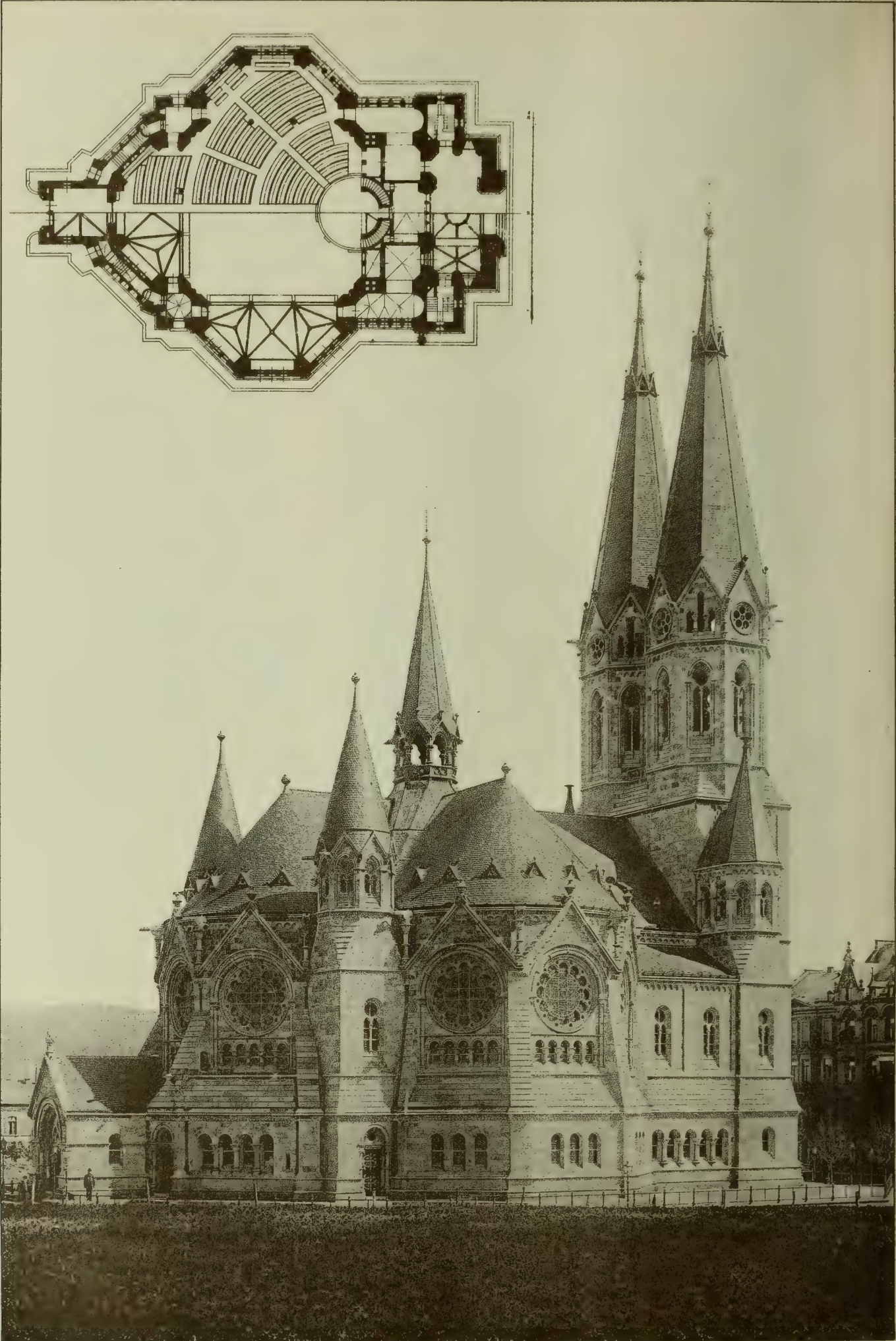
PRODUCED UNDER THE DIRECTION OF MR. WALTER CRANE









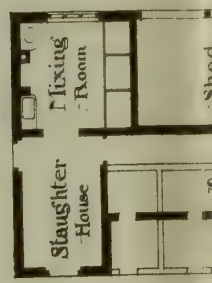
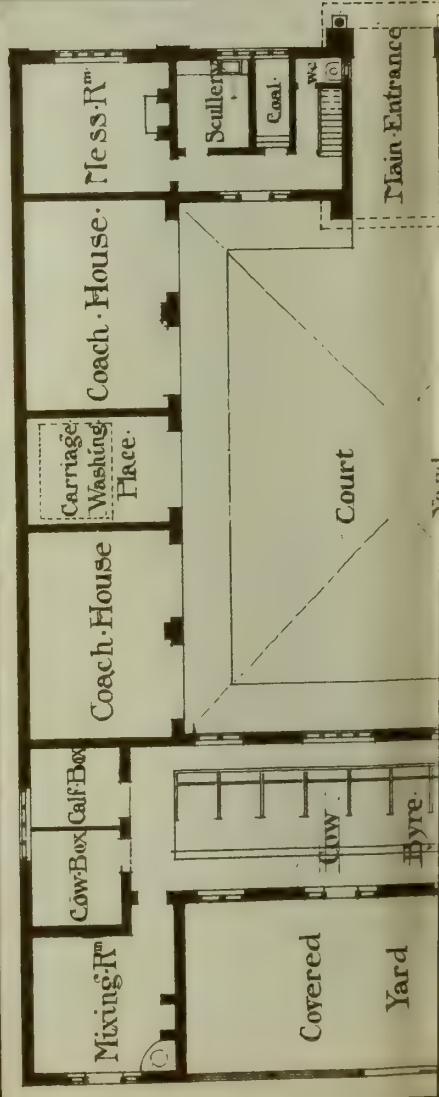








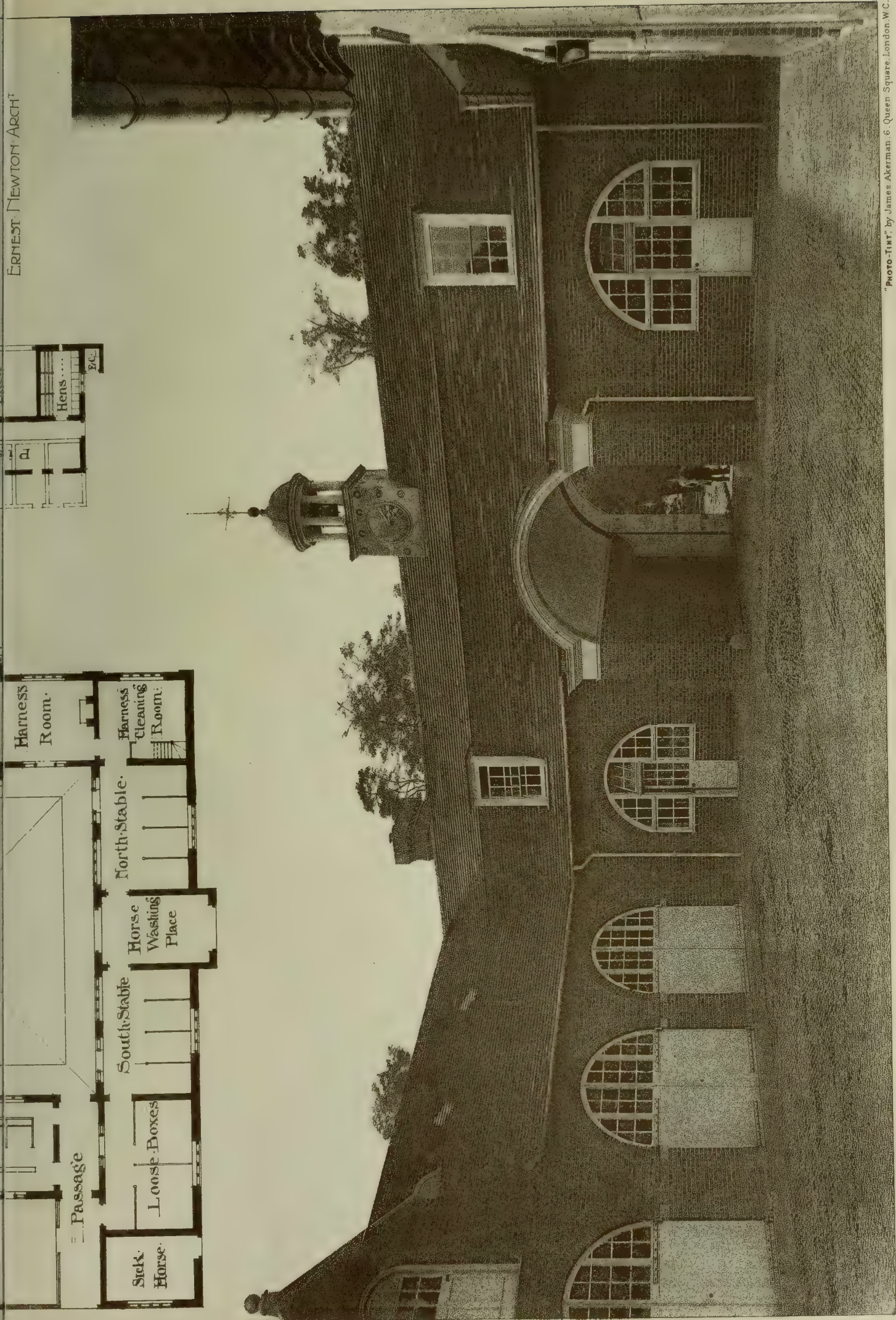
THE BUILDING NEWS, APRIL 16, 1897.



BICKLEY HALL STABLES.  
BICKLEY, KENT...







"PHOTO-TINT" by James Akerman. 6, Queen Square, London, W.C.







S. APRIL 16, 1897.



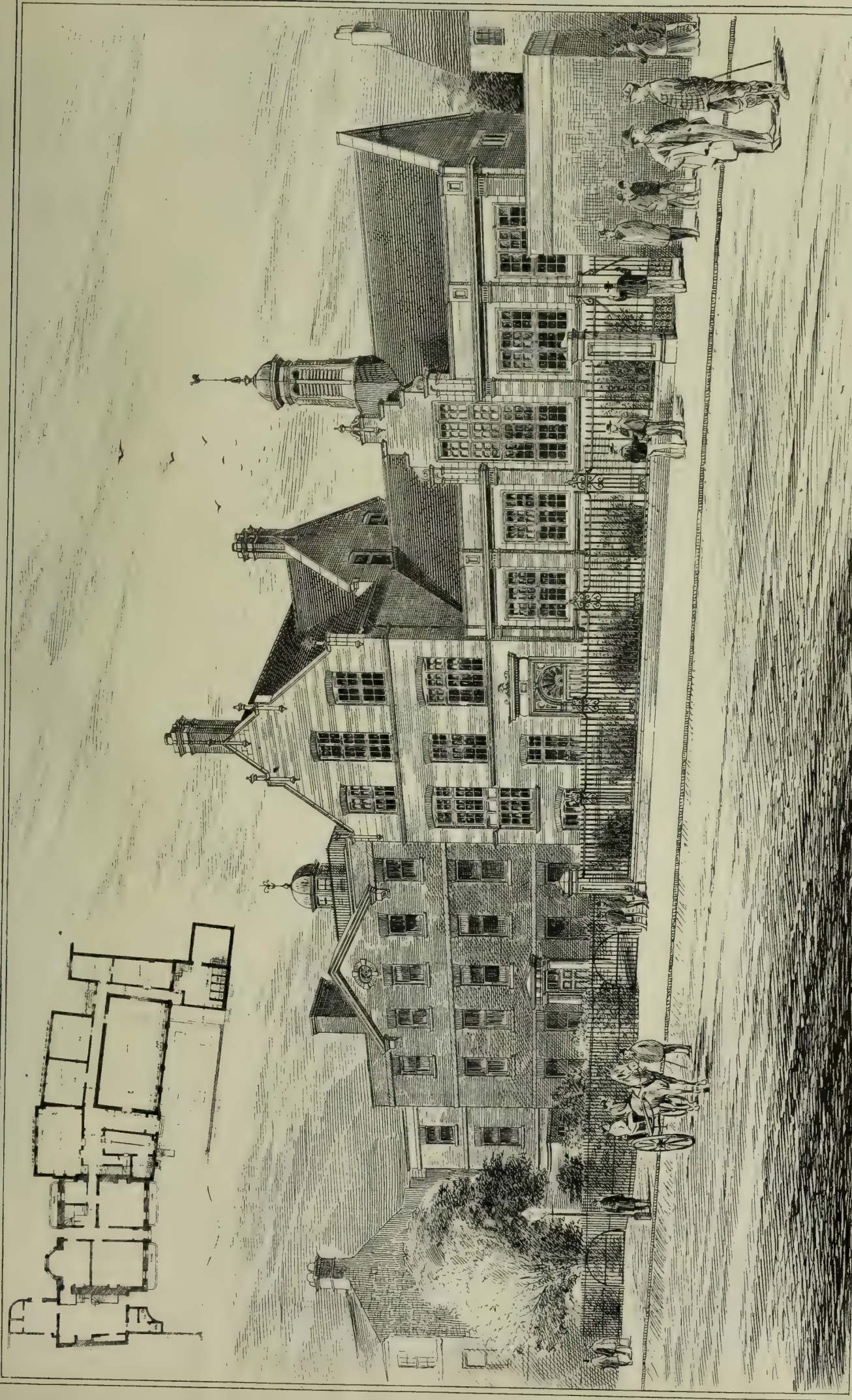
SEADEN · PROF. OTZEN · ARCH<sup>T</sup>

"PHOTO-TINT", by James Akerman, 6, Queen Square, London, W.C.









Grammar School WISBECH

W<sup>m</sup> M FAWCETT M.A., Architect 1897

Photo lithographed & Printed by James Akerman 6 Queen Square W.C.







## LEGAL INTELLIGENCE.

**THE TRAMWAYS ARBITRATION IN LONDON.**—In the Queen's Bench Division, on Friday, Mr. Justice Grantham and Mr. Justice Wright heard a motion to set aside or remit an award of Sir Frederick Bramwell, sitting as arbitrator between the London County Council and the London Tramways Company, in respect of the purchase by the County Council of a portion of the tramway undertaking. Sir Robert Reid, Q.C., for the Tramways Co., said that the London County Council desired to purchase two tramways under section 43 of the Tramways Act of 1870. They had taken about two miles out of 14. In respect of this Sir Frederick Bramwell had made an award of £25,100. At the hearing evidence was tendered on behalf of the company of existing profits—i.e., profits undistributed on January 15, 1895. The arbitrator refused, however, to listen to this, and the element of existing profit had not, therefore, been considered. Sir Frederick Bramwell based his refusal on the case of the "Edinburgh Street Tramways Company v. Provost of Edinburgh" (1894, App. Ca., 456). That was a case in which no evidence of existing profits had been tendered, but only of past and future or speculative profits, and was therefore distinguishable. The Court, without calling on the counsel for the other side, dismissed the application. Mr. Justice Grantham said the Court was not justified in acceding to the application, for on the authority of the case cited it was clear that the arbitrator was right.

**T. DREW-BEAR, TOLPUTT, AND BROWN v. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON.**—NEW TRIAL ORDERED BY THE DIVISIONAL COURT. —Another stage was reached on Tuesday in the settlement of this remarkable and protracted case, a claim by a committee of trustees, as creditors of William Brooks, builder, of Folkestone, against the guardians of the poor for St. Pancras and their architects, Messrs. A. and C. Harston, of 15, Leadenhall-street, E.C., for a balance of £24,226, or alternatively £24,265, alleged to be due on a building contract for the rebuilding of portions of St. Pancras Workhouse. The case originally came before Mr. Justice Cave, who after a part hearing, regarded these issues as so complicated that he ordered it to be referred to arbitration. It was then heard by Mr. J. Edward Ridley, Q.C., the Official Referee at the Old Bankruptcy Buildings, Portugal-street, the sittings extending from July of last year till the 17th ult., when judgment was given for the plaintiffs against the guardians with costs, the damages to be ascertained hereafter, on the ground that they failed to give the contractors and his trustees possession of the site at the specified time. Judgment was also entered for the architects against the plaintiffs with costs. The successive headings of this arbitration and the judgment were fully reported in our issues of July 17 and 24, and November 20 and 27, 1896 (pp. 98, 133, 755, and 769 last volume), January 22 and 29, and March 5, 12, and 19 last (pp. 149, 185, 365, 379, and 413 current volume). In the Court of Queen's Bench on Tuesday last, Mr. Justice Grantham and Mr. Justice Wright, sitting as a Divisional Court, heard an appeal by the guardians against the Official Referee's decision, on the ground that the judgment and the findings upon which it was founded were erroneous in fact and in law, and that there was no evidence or any sufficient evidence to justify the learned Referee in finding either that the plaintiffs' contract with the guardians was set aside or that the plaintiffs were entitled to substantial or any damages, or to any damages or allowances not duly provided for in the contract. Mr. English Harrison and Mr. W. Moyses appeared for the appellants (the St. Pancras Guardians), and Mr. Reginald Bray and Mr. Alfred A. Hudson for the respondents (the plaintiff-trustees). After hearing the arguments of counsel, the Court allowed the appeal. In pronouncing judgment, Mr. Justice Grantham observed that he and his learned brother both felt that the case must go back or be reopened so far as it related to the action against the guardians. He had read the judgment of the learned Official Referee very carefully, and he could not help feeling that throughout the learned Referee's own views of the case was that, owing to alterations in the contract—as in gaining possession of the site, and so forth—the plaintiffs were justified in claiming a *quantum meruit*. The case of "Bush v. The Trustees of the Port and Town of Whitehaven," which the learned Referee felt bound to follow, did not, he thought, apply to the present case, as the circumstances were entirely different. There might have been some delay in getting possession of the site to the builder which might have occasioned some expense to him; but he (the learned Judge) was bound to say he could not read the contract in the way suggested by Mr. Bray—namely, that Brooks was entitled to have the entire area given up to him absolutely, so that he could have the whole of the work going on at the same time. He could not see any justification for such an argument. If there had been a delay, and the contractor had been damaged thereby, the contractor was, no doubt, entitled to damages for the

delay; but there was, so far as he could see, no ground for claiming a *quantum meruit*. In those circumstances, he thought that the judgment of the Official Referee must be set aside, so far at least as that question was concerned. Mr. Justice Wright concurred in this ruling. The learned Referee, he added, had told them the facts on which he based his judgment; but those facts did not seem to justify the Referee in holding that the case of "Bush v. the Trustees of the Port and Town of Whitehaven" was applicable in the present case. In the Whitehaven action there was abundant evidence to satisfy the jury that both plaintiff and the defendants permitted the works to proceed on the understanding that the contract was to be under altered conditions; but there was no suggestion of anything of that kind in the present case. Mr. Justice Grantham added that the decision the Court arrived at was that the judgment against the guardians must be set aside, and that practically there must be a new trial. The question still to be determined was what form the new trial should take. Mr. Harrison expressed a wish to go before another Referee. Mr. Justice Wright thought that Mr. Ridley would hardly care to try the case over again. Mr. Harrison said he would agree with his learned friend on a gentleman to try the case. Mr. Bray said he would like to take the opinion of the Court of Appeal on the point then before the Court, and therefore the question of naming a gentleman to try the case over again would not for the present arise. After further discussion the Court ordered that the judgment obtained by plaintiffs against the guardians should be set aside, with costs, there being a stay of execution for three weeks with the view to plaintiffs' appealing from this decision to the Court of Appeal.

**FRAUD ON AN ARCHITECT.**—Thomas Charles Stewart, 45, and Francis Stewart, 13, of Waverley-road, Tottenham, were charged at West London Police-court, on Saturday, with obtaining money and goods on false pretences. Mr. Francis Miller, architect, of the Avenue, Bedford-park, said that on March 27 the younger prisoner called at his house with a letter from his father in which the writer stated that he was employed by witness as foreman in 1885, and was now just recovering from a severe attack of pleurisy. He had received an offer of permanent employment, but he was afraid he could not accept it as he had pawned all his clothes and tools for food, and he begged for a temporary loan to enable him to redeem his goods, concluding with a reference to his little children, who were clamouring for the food it was out of his power to supply. Thinking he recognised the name, witness gave the boy some money, and afterwards wrote to the firm of contractors the prisoner mentioned. They replied that they knew nothing of the man, and when the boy came again for more money witness communicated with the police. Detective-Sergeant Pollard said that the prisoner had been practising this kind of fraud for the past seven years, and he was exposed in *Truth* in December, 1895. The prisoners were remanded.

**THE SINGULAR LAND DISPUTE AT YELVERTON.**—**RITCHIE v. KNOWLES.**—In the Queen's Bench Division of the High Court on Wednesday week, Justices Hawkins and Lawrence, sitting as a Divisional Court, gave judgment in the case of "Ritchie v. Knowles," which was argued before them last week on appeal from the Tiverton County Court. Mr. Justice Hawkins, in giving judgment, said the plaintiff claimed to have possession of a piece of land which lay at the north-west corner of land which undoubtedly belonged to him, and he also claimed to have the right to use another piece of land that was at the south-west end, and he wanted an injunction against the defendant to restrain him from using it. He also wanted a great many other things which he did not get, and was not likely to get. In 1887 the West Country Land Estate Company had a plot of land near Yelverton for sale, which they put up for auction. The land was not sold by auction, but before the year 1890 a Mr. Bensley purchased one of the plots, and was in the possession of it in that year. In 1889 the present plaintiff entered into negotiations with the company, through their managing director, for the purpose of purchasing a plot of land which lay to the west of Mr. Bensley's land, but he said he would only buy upon the condition that they got that gentleman to sell to him the plot of which he was the owner. That was done, and the conveyance executed. In February, 1890, defendant also took some land from the company, and plaintiff now contended that some of that land belonged to him. He wanted, very unfairly, to get a piece of land which he never ought to have asked for, because he had got a piece of frontage land given to him at his own wish, instead of a back piece of land. Therefore, as regards these two plots of land, he thought the defendant ought not to be turned out of the land which he claimed at the north-west corner, and he thought there was no necessity to grant any injunction in respect of land at the south-west corner. Then came another question. In July, 1894, it was proposed to build a party-wall to mark out the boundaries between the properties, and that plaintiff

and defendant should pay half the cost. The wall was built, and on this question there was no doubt in his mind that the wall was intended to accurately divide the land as had been agreed, though, apparently, the plaintiff was very careless in looking after his own interests. The plaintiff had not paid his half of the expense, and defendant counter-claimed for that expense. The County Court Judge had decided in favour of the defendant on all points, and he thought that decision was right. The appeal would, therefore, be dismissed with costs. Mr. Justice Lawrence concurred, and said he thought it was a most ungenerous action on the part of the plaintiff to put the mildest term on it. The appeal was dismissed, with costs.

**PUBLIC HOUSE ALTERATIONS AND THE BUILDING ACT.**—Mr. Denman gave his decision at the Lambeth Police-court, on Friday, in the case of "Tyerman v. Marsland," which raised a question of some interest to builders. It was an appeal by Mr. Tyerman, a builder, against a notice of objection served upon him by Mr. Ellis Marsland, M.S.A., district surveyor, in connection with some alterations which the appellant is carrying out at the "General Havelock," Parkstone-road, Peckham. Mr. Passmore appeared for Mr. Tyerman, the appellant, and Mr. Marsland conducted his own case. It appeared that the public-house in question is used partly for the purposes of trade and partly for the purposes of a dwelling-house, and the notice served by the district surveyor was based upon sub-section 2 of section 74 of the London Building Act, 1894, which provides that in every building exceeding ten squares in area used in part for purposes of trade and in part as a dwelling-house, the part used for the purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and that all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of fire-resisting materials. Mr. Marsland relied upon sections 207 and 209 of the Act as connecting the building with section 74. The first section provides that it shall not be lawful to make any alteration of any building in such manner that when so altered it will, by reason of such alteration, not be in conformity with the provisions of the Act applicable to new buildings. Section 209 provided, "that every addition to or alteration of a building, and any other work made or done for any purpose in, to, or upon a building (except that of necessary repair not affecting the construction of any external or party wall) shall, so far as regards such addition or alteration or other work, be subject to the provisions of this Act, and of bye-laws thereunder relating to new buildings." On behalf of Mr. Tyerman, the appellant, Mr. Passmore submitted that the words "by reason of such alteration" in section 207 entirely exempted the building in question from the provisions of section 74, sub-section 2. He took it that section 207 would apply to a case where the existing building had been less than ten squares in area or where it had been used solely for the purposes of trade or solely for the purposes of a dwelling-house, and was to be altered into a house which was to be used jointly for the purpose of trade and as a dwelling-house, but in this case neither of such alterations was being made. Practically the only alteration which was being made was a direct advantage. A dangerous staircase was to be removed, and a staircase absolutely inclosed with fire-resisting bricks substituted. This was a question of great moment to builders and architects in London, and he thought he was safe in saying that Mr. Marsland was the only district surveyor who had had the temerity to require anything of this sort to be done. Mr. W. M. Bruton, the architect, was engaged in 30 or 40 public-house alterations in the district of the London County Council, and the question had never been suggested to him by any other of the district surveyors. Mr. Denman, who had reserved judgment, said he was of opinion that the case was settled by the decision under the earlier Act in "Scott v. Legge" (10 Q.B.). The wording of the section of the Act of 1855, on which that case was decided, was precisely the same as that in the present case, and he saw no reason for supposing that this Act was intended to apply to buildings which could not have been dealt with under the earlier Act. The district surveyor's notice would accordingly be set aside.

**LOCAL AUTHORITIES' POWER TO DISAPPROVE PLANS.**—**SMITH v. CHORLEY RURAL DISTRICT COUNCIL.**—In the Court of Appeal, recently, before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Chitty, judgment was delivered in this appeal by the plaintiff from the judgment of Mr. Justice Kennedy after the trial of the action with a jury. The plaintiff proposed to build certain houses in the defendants' district, and deposited plans of the houses with the defendants. The defendants considered that the proposed houses amounted to the laying out of a new street, and disapproved of the plans upon the ground that the proposed street was not of the width required by their by-laws. The action was brought for a *mandamus* to compel the defendants to approve and



pass the plans. At the trial the jury found that the plaintiff by the proposed buildings was not laying out a new street. The learned Judge, upon further consideration, held that an action for a mandamus would not lie, the proper remedy, if any, being by application for a prerogative writ of mandamus. He therefore gave judgment for the defendants. The Court dismissed the appeal. The Master of the Rolls said that the defendants, a local tribunal, which admittedly had jurisdiction to consider whether they would approve or disapprove of certain plans laid before them, entertained that question. The plans were laid before them, not that they might ministerially signify their approval, but that they might say whether in the honest exercise of their jurisdiction they would approve or disapprove of them. It was admitted that the defendants honestly considered the question. The question before them depended upon one fact, amongst others—namely, whether this was a new street. They were bound to consider and determine that fact. They decided that it was a new street, and they disapproved of the plans. It was impossible to say that they had done anything beyond their jurisdiction. They acted within their jurisdiction in every way. It followed that no appeal lay from that decision. The plaintiff brought this action for a mandamus to compel them to alter their decision and to approve of the plans. The learned Judge thought it better not to withdraw the question whether or not it was a new street from the jury, and the jury found that it was not a new street. Upon further consideration, the learned Judge came to the conclusion that there was no question for the jury, and entered judgment for the defendants. In his (the Master of the Rolls) opinion no appeal lay from the decision of the local tribunal acting honestly within their jurisdiction. Therefore there was no question for the jury, and this action could not be maintained. The Lords Justices delivered judgment to the same effect.

**ARBITRATION AT SOUTH MIMMS.**—At the Surveyors' Institution on Tuesday, the arbitration case of "The South Mimms Rural District Council v. Marsden" came on for hearing before Mr. A. Savill, sitting as sole arbitrator. The case was a singular one. The claim was for £5,608, made by Mr. B. Marsden, a dairy farmer, of South Mimms, near Barnet, against the district council, in respect of a right-of-way through the former's estate. For some time past the council have been considering the establishment of a sewage farm for the district. Recently they gave notice to Mr. Marsden that they should require a portion of his estate for the purpose of making the necessary roadway and ground farm. At that time a public right-of-way ran through a part of the estate; but the Council decided not to use this, and to open up another road which would run through Mr. Marsden's homestead. This, it was held by the claimant, would considerably damage the best part of the estate, and further, would affect his business as a dairy farmer by reason of the fact that large quantities of sewage matter would be carried through the estate and past the farm where the dairy business was carried on. In respect of the damage which would be sustained by the council acquiring the right of way, a sum of £5,000 was claimed, this sum not to include the cost of purchase of 25 acres needed by the Council for their sewage farm.—Mr. Cripps, Q.C., appeared for the claimant, and Mr. Freeman for the Council.—Mr. Cripps having stated the case for the plaintiff, evidence was given by Mr. R. Oakley and Mr. Driver in support of the claim, each of whom estimated the amount of compensation at £5,608.—Mr. Freeman, on behalf of the Council, having asked for a more moderate award than the amount claimed, the case was closed, and the arbitrator reserved his award.

**ROAD MAINTENANCE AND SEA DEFENCES.**—**KENT COUNTY COUNCIL V. SANDGATE URBAN DISTRICT COUNCIL.**—In the Queen's Bench Division, last week, before Mr. Justice Cave and Mr. Justice Lawrence, a special case was heard, stated by an arbitrator, raising a question as to whether the Urban District Council of Sandgate or the Kent County Council were liable to pay for the repairs and maintenance of a certain sea-wall and groynes adjoining and supporting a main road running by the sea at Sandgate. The award was made by an arbitrator appointed by the Local Government Board, and was stated in accordance with an express order of the Divisional Court, after a refusal by the Local Government Board, in the form of a special case. It recited that a difference existed between the Kent County Council and the district council in respect of the amount which should be paid to the district council "in respect of the maintenance and repair and reasonable improvement connected with the maintenance and repair" of the road running from the bridge over the military canal at Seabrook to the Fleur-de-Lis public-house at Sandgate, being of the length of one mile one furlong, being a main road, during the four years ending March 25, 1893. The road the subject of the arbitration is so much of the road leading from Folkestone to Hythe as is within the urban district of Sandgate. It runs along by the sea. The road is an ancient highway,

and was never at any time subject to any turnpike trust. In or about 1844 a sea-wall was constructed by the Surveyor of Highways for Cheriton. Along the wall and the filling at the back thereof a foot-way, 12ft. in width, was constructed, which was kept in repair by the Local Board as Surveyors of Highways. In 1850 the Sandgate Local Board was constituted. From that year the road was kept in repair by the local board. In 1875 the esplanade was widened. In 1883, the road, on the application of the Sandgate Local Board, was declared a main road, and from that date the county council paid half the expenses of the maintenance and repair of the road, but not of the sea-wall or the esplanade made adjoining the road. The wall and esplanade were damaged by the sea in 1889, 1890, 1892, and 1894, when the district council borrowed money for rebuilding the sea-wall. The powers of the local board were transferred to the district council in November, 1894. That council made a claim on the Kent County Council for the expenses incurred during the past four years in reconstructing and repairing the sea-wall, &c. This being disputed, the matter went to arbitration. The arbitrator awarded that £6,188 7s. 6d. should be paid by the county council to the district council for their expenses in rebuilding portions of the wall and erecting certain groynes. As to other portions, he held that the wall was not part of the main road, and in respect of an eighth groyne he also found to the extent of about £1,500 in favour of the county council. Mr. Dickens, Q.C., for the Sandgate District Council, said the question was what was "maintenance, repair, and reasonable improvement connected with the maintenance and repair" of the road. There were several parts of the road. As to one part the arbitrator had found that the wall was in fact part of the road. The county council were therefore liable for that part. As to another part the arbitrator had not found that the wall was necessary to the maintenance of the road. Still he stated facts that showed that if the wall were washed away the road would be endangered. The county council were liable to defray the cost of maintaining the whole of the sea wall which was necessary to keep the main road in existence. The esplanade was only in the nature of a footpath which formed part of the main road. Mr. Macmorran for the Kent County Council argued that works of sea defence of this kind were not maintenance and repair of a road. The road, under section 15 of the Highways Act of 1875, had been declared a main road because it was a through road. Under that Act the county contributed one-half of the expenses. The Act of 1888 made no difference, except that the county council were to pay for all instead of half the maintenance and repair of roads in the county. When urban district councils retained their own main roads the county council were to contribute "towards" the expenses. The county had not paid for the maintenance and repair of the wall or esplanade. The building of the wall was not a repair to the road. A parish could not have been indicted for non-repair of a road if it were washed away. Mr. Justice Cave delivered judgment in which the court upheld the award of the arbitrator. The effect was that that part of the wall which formed part of the main road was to be paid for by the county council, and that they were not liable for that part which did not.

#### CHIPS.

Owing to the decease of the principal of the firm of Messrs. Patman and Fotheringham, of 100 and 102, Theobald's-road, W.C., Mr. R. S. Parker, the business will be carried on in future under the old style by Messrs. James F. Parker and Alfred E. Parker.

In the Official Referee's Court on Monday—before Mr. E. Ridley, Q.C.—the action New and Mayne Company v. E. Terah Hooley came up for hearing. The plaintiffs are electricians, and they claimed £2,442 for an electric-light installation at Risley Hall, Nottingham, the defendant's residence. Counsel for the plaintiffs applied for a postponement, but upon Mr. Hooley putting in an appearance there was a consultation, with the result that terms of settlement were agreed upon, the plaintiffs accepting £2,000 in full satisfaction of their claim, and no costs on either side.

The restoration of the exterior of Thirsk Parish Church has been commenced on the south aisle. The restoration, which is calculated to cost well up to £2,000, is expected to extend over two years. The interior was restored in 1876 and 1877, and reopened for service in October, 1878. Mr. Carnforth, who has for many years been engaged on the exterior of York Minster, is the clerk of the works.

Portions of the extensive tract of land acquired by the governing body between Eton College and Slough are now being laid out as playing-fields for the boys, whose numbers have considerably increased during the last few years. The ground, which was purchased some time ago, is situated upon the east and west sides of the Slough road, the frontages to which will, if necessary, be available for the erection of masters' houses.

## Our Office Table.

THE Home Arts and Industries Association will hold its thirteenth annual exhibition at the Albert Hall next month, from the 20th to the 24th inclusive. The yearly report just issued bears further evidence of the continued satisfactory progress of this useful society. During the past twelve months 27 new classes have become affiliated with the association. The Watts Endowment Fund, inaugurated by Mr. G. F. Watts, R.A., now amounts to £2,540, and the fine picture given by Mr. W. B. Richmond, R.A., for the benefit of the same fund, is now on view at the Albert Hall Studios. The various industries taught by the classes held all over the country include wood and metalwork, woollen, linen, and silk colouring, spinning, and weaving, basketwork, pottery, embroidery, bookbinding, lace and leatherwork. The judges of the exhibition work, amongst others, are Messrs. Ashbee, Voysey, Poynter, Spooner, Thackeray Turner, Halsey Ricardo, W. B. Reynolds, and Cobden-Sanderson. The profit of last year's exhibition was £107 8s.

A NEW society has just been founded for the purpose of reproducing by modern facsimile processes the works of Albert Dürer and his school. It proposes to issue, in the first instance, a series of faithful copies of the engravings, woodcuts, and drawings of these artists, and to include such paintings as have not been published in a satisfactory form, or are, from some other reason, inaccessible. A number of plates will also be devoted to illustrating the relations of German with Italian art during the 15th and 16th centuries. A portfolio will be issued annually, containing from fifteen to twenty-five subjects, accompanied by text. The method of reproduction will in each case be that best adapted to render the special qualities of the original. It has been decided to limit the number of members to 250 subscribers of one guinea each. A provisional committee has been formed, including amongst its members Mr. Walter Crane, Mr. G. Frampton, A.R.A., Mr. H. C. Marillier, Mr. Bernard Partridge, Mr. Frank Short, Mr. Gleeson White, and Miss Alice B. Woodward. Applications for membership are being received by Mr. Frederick Whelen, the hon. treasurer, at 59, Rossetti Mansions, Cheyne-walk, S.W.

THE fourteenth half-yearly general meeting of the Preston Master Builders' Association was held at the Castle Hotel, Market-place, on Wednesday week. The president, Mr. J. G. Christian, occupied the chair. Mr. John Tomlinson, the secretary, read the report, which stated that during the past six months 17 new members had joined, making the total number on the books 86. Relations with the operatives had been cordial during that period, and there had been very few disputes, even of a minor nature. On the motion of Mr. J. Swarbrick, seconded by Mr. T. Park, the report was unanimously adopted. Mr. John Christian was nominated for the vacancy on the council of the National Association caused by the death of Mr. Walmsley, and Messrs. Christian and T. H. Kellett were elected to represent the association on the executive committee of the Lancashire Federation, while Messrs. W. Hother-sall, J. Whitside, J. Swarbrick, R. Croasdale, W. Cooke, Jno. T. Nickson, and W. Tullis were elected delegates to attend the general meetings of that body. It was decided to nominate Mr. James Stows, of Stalybridge, for the presidency of the Lancashire Federation, and to nominate Mr. John Tomlinson for re-election as the secretary.

Memorial stones of a new Methodist Free Church in Elrlington-street, Plymouth, were laid on the 7th inst. The church is being rebuilt so as to accommodate 700 people, and adjoining will be a schoolroom, ten classrooms, and infants' room. The outlay will be about £5,500.

According to the report of the National Gallery Trustees for 1896, there were nine bequests and donations to the collection during the year. These included several paintings bequeathed by Miss Julia E. Gordon, two being by Wilkie, and six Gainsboroughs presented by the Misses Lane. Other bequests came from the Rev. J. H. Ash and the Rev. R. G. Maul, and presentations from Mr. H. T. Pfungst, Sir A. W. Franks, Mr. H. Gaskell, and Mr. M. Colnaghi. The gallery was visited by 489,842 persons on public days during the year, the daily average being 2,343, and on students' days 42,582 persons were admitted.



## MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—Edinburgh Architectural Association. Exhibition of Drawings of Old Scottish Work. 8 p.m.  
Edinburgh Architectural Society. Lecture by Fred Wilson. 8 p.m.

THURSDAY.—Society of Architects. Discussion on "The Advantages and Disadvantages to Country Architects of Belonging to a London Society." St. James's Hall, Piccadilly. 8 p.m.  
Dundee Institute of Architecture. "Heating by Steam and Hot Water." by Walter McGregor, R.P., Dundee. 8 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

The SIXTH ORDINARY MEETING of the Society of Architects for the Session 1896-97, will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on THURSDAY, April 22nd, 1897, at Eight p.m., when a DISCUSSION will take place on "THE ADVANTAGES AND DISADVANTAGES TO COUNTRY ARCHITECTS OF BELONGING TO A LONDON SOCIETY." Smoking will be permitted.

ELLIS MARSLAND, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.

## CHIPS.

A building boom has been going on in Paisley for over twelve months, but a record of plans passed was established in the Dean of Guild Court on Friday, when seventeen plans were submitted. Most of them were for large tenements and villas. Plans were also passed for the new technical college for Paisley, the estimated cost being £20,000. The building trade in Paisley was never, says a local journal, so busy as at present. There is not a mason, bricklayer, joiner, or painter in town who cannot find work.

The new Redland station on the Clifton Extension Railway was opened on Monday. It is situated close to the Lovers' Walk railway bridge. The platforms are 200 yards in length. On the Redland side is the stationmaster's office, with cloak-rooms, waiting-rooms, &c., and there is a general waiting-room on the other side. The total cost has been about £2,000.

The funeral of the late Mr. Edward Ellis, F.S.I., senior partner in the firm of Messrs. Edward Ellis and Son, land agents and surveyors, of Bedford Chambers, Exeter, took place at Newton St. Cyres churchyard on Friday. Mr. Ellis, who died on the previous Monday, was in his 70th year, and had been in business in Exeter for upwards of forty years.

The collection of high-class modern pictures and water-colour drawings of the late Mr. George James (proprietor of Morley's Hotel), 3, Trafalgar-square, came under the hammer at Messrs. Christie, Manson, and Wood's on Saturday. The collection comprised 100 water-colour drawings and 19 pictures, which realised a total of £11,963. Some very good prices were obtained, although in several instances slight reductions occurred in the market value of certain works.

The new electric organ in the M'Ewan Hall at Edinburgh University has just been completed, and was used for a recital on Saturday night. The organ has been built by Mr. Hope Jones, and has cost between £4,000 and £5,000. In the middle of the floor is placed the console or keyboard, which in appearance resembles a large American organ. The console and the organ are connected by a large cable 2in. in diameter, which contains 1,700 separate wires. The organ, which has 2,424 speaking pipes, is blown by a ten-horse electric motor, which gets its power from the city mains—the bellows being placed in the cellars below the platform.

The south side of Minster-street, Reading, is being set back as far as St. Mary's Parade, so as to gain an increased width of from 10ft. to 11ft. where the street is narrowest, at an estimated outlay of £3,000. The work is to be completed within four years.

The fine west window at the end of the north aisle of Grinton parish church, Swaledale, is being fitted with stained glass. The subjects are Faith, Hope, and Charity. Messrs. Lavers and Westlake, of London, are the artists.

The Public Works Committee of the Birmingham Corporation decided on Monday to recommend the latter body to accept the offer of Lord Calthorpe with reference to the widening of Edgbaston-road, the continuation of Lower Edwardes-street, and the improvement of the River Rea, and that the Public Works Committee should be authorised to carry out their share of the undertaking. The Baths and Parks Committee have already decided to recommend the adoption of that portion of the scheme connected with the provision of a Rotten Row. The scheme involves the giving up of a considerable portion of land by Lord Calthorpe, and an outlay upon the part of the two committees of nearly £17,000.

## Trade News.

## WAGES MOVEMENTS.

DOUGLAS, ISLE OF MAN.—On Wednesday week the Douglas joiners sent notices to the masters for an advance of wages from 28s. to 32s. a week, to take effect from the following Monday. This action has been influenced through some of the Masters' Federation employing non-union men to do fibrous plaster work at 33s. a week and boycotting union men. The consequence is that the whole of the joiners come out on strike on Monday in support of those who have been boycotted. The plasterers on strike have passed a resolution not to return to work until the joiners' question is settled.

GRAVESEND.—The carpenters and joiners threaten to strike unless they are granted an advance from 8d. to 9d. an hour, the latter sum being paid in the neighbouring town of Dartford. Six months' notice of this demand was given on November 1st, 1896. To add to the difficulties of master builders, there is a famine of bricks in Gravesend. The ostensible reason for this state of affairs being given that a London contractor some few months ago bought up all the bricks for some miles round Gravesend for use on the new railway into London. This may have been the means of sending up the price of bricks from 28s. to 38s. per thousand—but other reasons are assigned for this rapid rise, one being the existence of a powerful "ring" of the Kentish brickmakers. Slates have also gone up several shillings per thousand, so that local builders with houses under construction are hurrying work on with all possible speed in the event of a strike of carpenters, joiners, and bricklayers overtaking them. The manufacture of bricks is being hurried forward.

KENILWORTH.—The painters and plumbers have applied for an increase of 1d. per hour, on the ground that they are working below the standard wages of town workmen, who are receiving 7½d., and Kenilworth men only 6½d. The master painters and plumbers have met the men and effected a compromise, whereby they conceded a halfpenny. The workmen decided to accept this offer for the season which is now commencing.

LEICESTER.—On Friday evening a conference between representatives of the Leicester Bricklayers' and Plasterers' Societies was held at the Bull's Head Hotel, to discuss the question which has led to the withdrawal of plasterers from a number of building works in the town, viz., whether *in situ* and screeding for wood-block and tile floors is bricklayers' or plasterers' work. The conference was presided over by Councillor T. Smith, the local correspondent of the Board of Trade, in pursuance of the mutual invitation which the parties had sent to him. The proceedings, which were conducted in private, lasted three hours and a half. The matters in dispute were discussed in an amicable spirit, and ultimately a basis of settlement was agreed upon, which it is hoped may lead to a permanent settlement of the whole question.

At a meeting of the Edinburgh Architectural Society held on Wednesday in last week—the President, Mr. J. A. Williamson, A.R.I.B.A., in the chair—Mr. W. J. Anderson, A.R.I.B.A., lecturer on architecture in the School of Art, Glasgow, delivered a lecture on "The Origin of Greek Architecture." Mr. Anderson, who opened his lecture with an historical sketch of Greece, described the influence of wood construction on the architectural works of the Mycenaean age. The lecture was illustrated by limelight views.

A stained-glass memorial window was unveiled in St. Thomas's Church, Newcastle, on Sunday. The subjects represented are "The Infant Christ Blessing St. John," and "The Presentation in the Temple." It is from the studio of Messrs. Atkinson Brothers, of Newcastle-on-Tyne.

The City Corporation have adopted plans by Mr. A. Murray, the City surveyor, for the extension of the Guildhall School of Music, on a site at the rear of the present building, at an estimated cost of £20,500. Provision is made in the plans for an orchestral saloon, 47ft. by 55ft., with a maximum height of 30ft., capable of seating about 650 persons—about 440 on the ground floor, and the remainder in the gallery. The number of classrooms in the proposed new building would be 30; but as three of the classrooms in the present building would be required for access to the new wing, the net gain would be 27 rooms. The site of the proposed extension is about 72ft. by 51ft. 6in., or an area of 4,700ft. super.

The committee who have in hand the scheme for erecting a memorial town hall for Wrexham have adopted a report showing a scheme for building in Chester-street a council chamber, police-court, assembly-room, with accommodation for free library, reading-room, and art school, the suggested outlay being £20,000.

## LATEST PRICES.

## IRON, &amp;c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 12 6	£8 0 0
Rolled-Steel Joists, English.....	6 0 0	6 10 0
Wrought-Iron Girder Plates.....	5 15 0	7 10 0
Bar Iron, good Staffs.....	7 0 0	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0	17 10 0
Do., Welsh.....	5 15 0	5 17 6

## Boiler Plates, Iron—

South Staffs.....	7 17 6	8 5 0
Best Suedshill.....	10 0 0	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &amp;c., £6 15s. 0d. per ton.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	£11 0 0
Best ditto.....	11 5 0	11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0	£8 10 0
Cast-Iron Stanchions.....	6 0 0	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6

Cast-Iron Socket Pipes—

3in. diameter.....	5 10 0	5 15 0
4in. to 6in.....	5 5 0	5 10 0
7in. to 24in. (all sizes).....	4 15 0	5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 6s. per ton extra.]

Pig Iron—

Cold Blast, Lilleshall.....	105s. to 110s.
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

Gas-Tubes.....	75p.c. Fittings 77½p.c.
Water-Tubes.....	70
Steam-Tubes.....	62½
Galvanised Gas-Tubes.....	60
Galvanised Water-Tubes.....	55
Galvanised Steam-Tubes.....	45

10cwt. casks. 5cwt. casks.

	Per ton.	Per ton.
Sheet Zinc, for roofing and working.....	£22 10 0	£23 15 0
Sheet Lead, 3lb. per sq. ft. super.....	13 5 0	14 17 6
Pig Lead, in 1cwt. pigs.....	13 0 0	14 15 0
Lead Shot, in 28lb. bags.....	16 0 0	17 0 0
Copper Sheets, sheathing and rods.....	63 0 0	64 0 0
Copper, British Cake and Ingots.....	53 0 0	53 10 0
Tin, Straits.....	60 5 0	60 15 0
Do., English Ingots.....	64 5 0	64 10 0
Spelter, Silesian.....	17 10 0	17 15 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£3 15 0	9 15 0
Cut Floor Brads.....	8 10 0	9 10 0

Wire Nails (Points de Paris)—

	0 to 7	8	9	10	11	12	13	14	15	B.W.G.
8/6	9/0	9/6	10/3	11/0	12/0	13/0	14/9	16/9	per cwt.	

## TIMBER.

	per load	£13 10 0	to £16 10 0
Teak, Burmah.....	11 10 0	15 5 0	
" Bangkok.....	1 15 0	3 15 0	
Quebec pine, pitch.....	5 5 0	6 5 0	
" Oak.....	3 10 0	5 5 0	
" Elm.....	3 15 0	5 10 0	
" Ash.....	3 0 0	4 5 0	
Dantsic and Memel Oak.....	2 10 0	3 10 0	
Fir.....	2 15 0	4 15 0	
Wainscot, Riga p. log.....	2 15 0	4 10 0	
Lath, Dantsic, p.f.....	4 10 0	5 10 0	
St. Petersburg.....	5 0 0	6 10 0	
Greenheart.....	8 0 0	9 0 0	
Sequoia, U.S.A. ....per cube foot	0 1 9	0 2 0	
Mahogany, Cuba, per super foot	0 0 4½	0 0 6	
lin. thick.....	0 0 5	0 0 6½	
" Honduras.....	0 0 4	0 0 5	
" Mexican.....	0 0 4½	0 0 5	
Cedar, Cuba.....	0 0 4	0 0 5	
" Honduras.....	0 0 7	0 1 0	
Satinwood.....	0 0 3½	0 0 7	
Walnut, Italian.....	0 0 3½	0 0 7	

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in. —

Quebec, Pine, 1st.....	£20 0 0	to £23 0 0
" 2nd.....	14 10 0	16 10 0
" 3rd.....	7 0 0	10 10 0
Canada Spruce, 1st.....	9 10 0	11 0 0
" 2nd and 3rd.....	7 15 0	9 0 0
New Brunswick.....	7 10 0	8 5 0
Riga.....	7 10 0	8 10 0
St. Petersburg.....	9 10 0	13 10 0
Swedish.....	9 0 0	16 10 0
Finland.....	9 0 0	9 10 0
White Sea.....	10 10 0	17 0 0
Battens, all sorts.....	5 0 0	20 0 0

Flooring Boards, per square of lin.—

1st prepared.....	0 9 0	0 16 0
2nd ditto.....	0 7 6	0 12 6
Other qualities.....	0 5 9	0 7 0

Staves, per standard M.—

Quebec pipe.....	—	—
U.S. ditto.....	35 0 0	42 10 0
Memel, cr. pipe.....	230 0 0	240 0 0
Memel, brack.....	200 0 0	210 0 0

## OILS.

	per ton	£14 0 0	to £15 5 0
Linseed.....	25 5 0	26 5 0	
Rapeseed, English pale.....	23 10 0	26 15 0	
Do., brown.....	14 17 6	15 7 6	
Cottonseed ref.....	29 10 0	30 0 0	
Olive, Spanish.....	23 10 0	24 0 0	
Seal, pale.....	27 10 0	27 15 0	
Cocconut, Cochin.....	23 10 0	23 10 0	
Do., Ceylon.....	22 9 0	23 10 0	
Palm, Lagos.....	19 0 0	20 0 0	
Oleins.....	0 6 3	0 7 6	
Lubricating U.S.....per gal.	0 4 9	0 6 6	
Do., black.....	1 2 0	1 5 0	
Tar, Stockholm.....per barrel	0 12 6	0 15 0	
Archangel.....	21 0 0	21 10 0	
Turpentine, American.....per ton	21 0 0	21 10 0	



## LIST OF COMPETITIONS OPEN.

Horncastle—Stanhope Memorial, for Market-place (£300 limit).	£15 (total commission)	S. G. Overton, Secretary, 2, Manor House, Horncastle	April 17
Guernsey States Assembly Hall (£15,000 limit)	£100, £50	N. Domaille, Supervisor of Harbour, States Offices, Guernsey	" 17
Lampport—Sewerage and Sewage Disposal	£20, £10	E. G. Louch, Clerk R.D.C., Lampport, Somerset	" 17
Lane Buckley, Northants—Water Supply Scheme	50gs.	William Willoughby, jun., Clerk, Daventry	" 21
Ormskirk—Guardians' Board-room, &c.	£20, £15, £10	Alfred Dickinson, Clerk to Guardians, Ormskirk	" 24
Halifax—Police Station and Court House (no Assessor)	£5, £25	Keighley Walton, Town Clerk, Halifax	" 30
North London—Extension of Church	No premium	—, Murrow, 2, Finsbury-square, E.C.	" 30
Crompton—Public Baths (£1,000 limit)	£30, £20, £10	J. H. Mills, Clerk U.D.C., Town Hall, Shaw, near Oldham	May 1
Tonbridge Technical Institute and Free Library (£1,000 limit)	30gs., 20gs., 10gs.	A. H. Neve, jun., Clerk U.D.C., 83, High-street, Tonbridge	" 15
Elne, France—Water Supply Scheme (3,300 inhabitants)	£100, £50, £25	La Marie, Elne, Pyrénées Orientales	July 1
Carlton, Victoria—Children's Hospital	50gs. (merged in 5 p.c.), 20gs., 10gs.	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia (1898)	Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	£20 (merged), £15, £10	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	"
Burnley U.M.F.C. Church	No premium offered	Rev. A. J. Ellis, 35, Rectory-road, Burnley	"
Chesterfield—Brewery-street Board School (360 places)	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield	"
Bexhill-on-Sea—Drinking-fountain & Dog-trough (£200 limit)	No premium offered	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill	"
Burnley—Fountain, Queen's Park (£500 limit)	£10, £5	G. H. Pickles, Borough Surveyor, Burnley	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

Belper—Fever Hospital, Crich-lane	Joint Hospital Committee	M. Hunter, Architect, Bridge-street, Belper	April 17
Kendal—Shop, Wildman-street	Rev. Father Stevenson	John Stalker, M.S.A., Kendal	" 17
Bodmin—House near G.W.R. Station	Co-operative Society	W. J. Jenkins, Architect, Bodmin	" 17
New Swindon—Alterations to Stores	Llangyllach R.D.C.	Secretary, Victoria-road, Swindon	" 17
Enniskillen—New House	Perseverance Foundry Co.	J. H. Charlton, Enniskillen	" 17
Gorvorton—Masonry, Tanks, &c.	W. H. D. Horsfall, Architect, 9, Harrison-road, Halifax	J. Thomas, Surveyor, 32, Fisher-street, Swansea	" 17
Elland—Foundry and Offices	D. S. Thomas, Church-road, Ton, Rhondda Valley	W. H. D. Horsfall, Architect, 9, Harrison-road, Halifax	" 17
Pentre—Re-erection of Boot Exchange	J. Gray, Bailie, Dalkeith	D. S. Thomas, Church-road, Ton, Rhondda Valley	" 17
Eskbank—Additions, Combination Poorhouse	H. Burgess, Clerk, Brighton-road, Sutton, Surrey	J. Gray, Bailie, Dalkeith	" 19
Witham—School Infirmary	S. Hill, Architect, Redruth	H. Burgess, Clerk, Brighton-road, Sutton, Surrey	" 19
Redruth—Laboratory at Science Schools	Rural District Council	J. Villar, la. Cambray, Cheltenham	" 20
Tredlington, Tewkesbury—Fever Hospital	Rural District Council	Medley Hall, Architect, 29, Northgate, Halifax	" 20
Halifax—Two Houses, Albert Promenade	Cumberland County Council	Jas. Villar, Architect, la. Cambray, Cheltenham	" 20
Tewkesbury—Fever Hospital	Yapp's Laundry Co.	County Surveyor, Carlisle	" 20
Walton—Stone Bridge over Camp Beck	Rev. C. E. Norman, "Holmlea," Hythe	Rev. C. E. Norman, "Holmlea," Hythe	" 20
Hythe, Kent—Wesleyan Chapel and Schools	Johnstone Brothers, Architects, 39, Lowther-street, Carlisle	Johnstone Brothers, Architects, 39, Lowther-street, Carlisle	" 20
Stretford—Steam Laundry and Stables	Johnstone Brothers, Architects, 39, Lowther-street, Carlisle	J. Mackenzie, Architect, 42, Stevenson-street, Oban	" 20
Whitefield, Manchester—Alterations Lily Hill Works	J. Mackenzie, Architect, 42, Stevenson-street, Oban	H. O. Hill, Clerk, Clerkenwell-road, E.C.	" 21
Salen, Mull—Church	H. O. Hill, Clerk, Clerkenwell-road, E.C.	A. E. Bolton, Secretary, Paddington Station, W.	" 21
Mitcham—Laundry, Baths, &c., at Workhouse	A. E. Bolton, Secretary, Paddington Station, W.	Gardside and Keyworth, Architects, Ropergate, Pontefract	" 21
Birkenhead—Twenty-five Cottages, Hinderton-road	Gardside and Keyworth, Architects, Ropergate, Pontefract	E. Pitts Fenton, Clerk, 30, Tanner-street, Bermondsey, S.E.	" 22
Tanshelf—Thirteen Houses	E. Pitts Fenton, Clerk, 30, Tanner-street, Bermondsey, S.E.	J. Kirk and Sons, Architects, Huddersfield	" 22
Rotherhithe—Demolition of Buildings, &c., Lower-road	J. Kirk and Sons, Architects, Huddersfield	M. Regan, Clerk, Mallow	" 23
Huddersfield—Additions to Meltham Mills	M. Regan, Clerk, Mallow	W. Wrigley, 10, Wood-street, Wakefield	" 23
Mallow—Workhouse Repairs	W. Wrigley, 10, Wood-street, Wakefield	Gardside and Keyworth, Architects, Ropergate, Pontefract	" 24
Wakefield—House, Stanley-road	Gardside and Keyworth, Architects, Ropergate, Pontefract	W. Feather, Architect, Queen-street, Cardiff	" 26
Purston—Three Villas, Ackworth-road	W. Feather, Architect, Queen-street, Cardiff	H. P. Mann, Town Clerk	" 26
Llangollen—County School	H. P. Mann, Town Clerk	Cancellor and Hill, Architects, 12, Jewry-street, Winchester	" 26
Chatham—Town Hall and Municipal Offices	Cancellor and Hill, Architects, 12, Jewry-street, Winchester	C. W. Tagg, Vestry Clerk, Vestry Hall, Peckham-road, S.E.	" 26
Fareham—Chaplain's Residence, Hants Asylum	C. W. Tagg, Vestry Clerk, Vestry Hall, Peckham-road, S.E.	S. Wilkinson, Architect, Sowerby Bridge	" 27
Peckham—Inclosure Walls, South London Art Galleries	S. Wilkinson, Architect, Sowerby Bridge	Jackson and Fox, Architects, 22, George-street, Halifax	" 27
Sowerby Bridge—West End Sunday School	Jackson and Fox, Architects, 22, George-street, Halifax	Secretary, Provincial Government, Petrokoff, Russia	" 28
Halifax—Extension, Automatic Screw Premises, Charles-street	Secretary, Provincial Government, Petrokoff, Russia	J. L. Wheatley, Town Clerk, Cardiff	" 29
Lodtz, Russian Poland—Cattle Market and Slaughter House (about £13,000)	J. L. Wheatley, Town Clerk, Cardiff	S. Treval, F.R.I.B.A., Truro	" 30
Cardiff—Demolishing and Rebuilding Chimney at Cogan Pumping Station	S. Treval, F.R.I.B.A., Truro	Hanbury Thomas, Secretary, Commercial-street, Sheffield	May 1
Newquay—Headland Hotel	Hanbury Thomas, Secretary, Commercial-street, Sheffield	Offices, Service Administratif, Public Works Ministry, Cairo	" 3
Neepsend, Sheffield—Water Tower at Gasworks	Offices, Service Administratif, Public Works Ministry, Cairo	C. J. Stewart, Clerk, Spring-gardens, S.W.	" 4
Cairo—Native Tribunal Buildings	C. J. Stewart, Clerk, Spring-gardens, S.W.	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	" 5
Charlton—Shelter, Maryon Park	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	" 5
Scarborough—Post Office Enlargement	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	J. H. Rutherglen, Clerk, Marlow-road, W.	" 7
Banstead—School Enlargement	J. H. Rutherglen, Clerk, Marlow-road, W.	Horace Hamilton, Clerk, 11, Bank-street, Ashford	" 7
Ashford, Kent—Workhouse Additions	Horace Hamilton, Clerk, 11, Bank-street, Ashford	R. W. Partridge, Clerk to Asylums Committee, 21, Whitehall-pl., S.W.	" 10
Hanwell Asylum—Temporary Iron Buildings	R. W. Partridge, Clerk to Asylums Committee, 21, Whitehall-pl., S.W.	F. W. Bailey, Clerk, Cleveland-street, W.	" 10
Hendon—Sick Asylum	F. W. Bailey, Clerk, Cleveland-street, W.	Phillips and Norfolk, Architects, Catford Bridge, S.E.	"
Catford—Eight Terrace Houses, Beechfield-road	Phillips and Norfolk, Architects, Catford Bridge, S.E.	Walter Andrew, Architect, Parkstone, Dorset	"
Mansfield—Three Shops, Leeming-street	Walter Andrew, Architect, Parkstone, Dorset	A. A. Gibson, Architect, 8, Cambridge-crescent, Harrogate	"
Knaresborough—Additions to Workhouse Infirmary	A. A. Gibson, Architect, 8, Cambridge-crescent, Harrogate	W. Dixon, Architect, St. John-street, Newcastle-on-Tyne	"
Leadville, Prudhoe—Houses	W. Dixon, Architect, St. John-street, Newcastle-on-Tyne	Issitt, Adkin, and Hill, Architects, Prudential Buildings, Bradford	"
Headingley—Billiard Room, &c.	Issitt, Adkin, and Hill, Architects, Prudential Buildings, Bradford	Rev. H. D. Tooke, Grandisburgh, near Ipswich	"
Grandisburgh, Suffolk—Rebuilding Chapel	Rev. H. D. Tooke, Grandisburgh, near Ipswich	Secretary, Co. Down Manufacturing Co., Carrickfergus	"
Woodburn, Carrickfergus—Two Cottages	Secretary, Co. Down Manufacturing Co., Carrickfergus	H. Tudor Thornley, Architect, 100, St. Mary-street, Cardiff	"
Cadoxton—Hotel, Comet-road	H. Tudor Thornley, Architect, 100, St. Mary-street, Cardiff	F. Bath, F.R.I.B.A., Crown Chambers, Salisbury	"
Alderbury, Salisbury—Twelve-roomed Bungalow	F. Bath, F.R.I.B.A., Crown Chambers, Salisbury	J. Hope, Architect, 40, Westgate-road, Alnwick	"
Alnwick—Villa	J. Hope, Architect, 40, Westgate-road, Alnwick	J. Scarth, Britannia-road, Morley	"
Morley—Two Cottages, Houdenclough-road	J. Scarth, Britannia-road, Morley	Telford Evans, 8, Queen-street, Cardiff	"
Llanhilleth—Completing 12 Houses	Telford Evans, 8, Queen-street, Cardiff	John Hutton, M.S.A., Kendal	"
Kendal—Houses at the Lomond	John Hutton, M.S.A., Kendal	W. A. Hobson, Architect, 82, Albion-street, Leeds	"
Burnantofts, Leeds—Boot Factory, Ashley-road	W. A. Hobson, Architect, 82, Albion-street, Leeds	C. F. Wilkinson, Architect, 35, Park-square, Leeds	"
Leeds—Shop and Warehouse, Wellington-road	C. F. Wilkinson, Architect, 35, Park-square, Leeds	C. W. Hunt, A.R.I.B.A., Ilkeston	"
Ilkeston—Public Offices, Market Place	C. W. Hunt, A.R.I.B.A., Ilkeston	J. Whitworth, 21, Millgate, Rochdale	"
Rochdale—Ten Houses in Howarth Cross-street	J. Whitworth, 21, Millgate, Rochdale	E. T. Sims, Hon. Sec., Portsmouth Lwn, Southampton	"
Southampton—Avenue Congregational Church	E. T. Sims, Hon. Sec., Portsmouth Lwn, Southampton	J. Crawshaw, Architect, 54, Otley-road, Shipley	"
Shipley—Twelve Houses, Windhill Crag	J. Crawshaw, Architect, 54, Otley-road, Shipley	Davidson and Beadle, Architects, 33, Grange-street, Newcastle	"
Shiremoor—Five Houses	Davidson and Beadle, Architects, 33, Grange-street, Newcastle	Fairbank and Wall, Architects, 3, Manor-square, Otley	"
Otley—Shed, Barras-lane	Fairbank and Wall, Architects, 3, Manor-square, Otley	Owner, Rose and Crown, New Herrington Barn	"
Penshaw—Twenty Houses	Owner, Rose and Crown, New Herrington Barn	Slecock and Reay, Architects, Octagon Chambers, Bath	"
Tiverton-on-Avon—Schools	Slecock and Reay, Architects, Octagon Chambers, Bath	J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	"
Audenshaw—Alterations, St. Stephen's Schools	J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	M. Jennings, Secretary, Ballinlirick	"
Ballinlirick, Co. Sligo—Creamery	M. Jennings, Secretary, Ballinlirick	—, Batting, 7, John-street, Adelphi, W.C.	"
Buckhurst Hill—Two Pairs Semi-detached Villas	—, Batting, 7, John-street, Adelphi, W.C.	Owner, 7, Cross Belgrave-street, Leeds	"
Leeds—Eight Houses	Owner, 7, Cross Belgrave-street, Leeds	P. Robinson, 72, Albion-street, Leeds	"
Leeds—Two Semi-detached Villas, Roundhay	P. Robinson, 72, Albion-street, Leeds	Secretary, Millbank Brick Co., Heywood	"
Heywood—Houses, Derby-street and Wham-lane	Secretary, Millbank Brick Co., Heywood	H. Sulley, Architect, Albert Chambers, Nottingham	"
Nottingham—Villa	H. Sulley, Architect, Albert Chambers, Nottingham	J. H. Burton, Architect, Guide-lane, Hooley Hill	"
Guide Bridge—Alterations, Railway Hotel	J. H. Burton, Architect, Guide-lane, Hooley Hill	F. W. Dixon, Architect, Trevelyan Buildings, Manchester	"
Falsworth—Business Premises, Old-lane	F. W. Dixon, Architect, Trevelyan Buildings, Manchester	J. Butler, Sunnybank House, Halton	"
Halton, Leeds—Five Houses, and Alterations to Four Houses	J. Butler, Sunnybank House, Halton	John Jackson, Architect, Barry-street, Bradford	"
Heaton—Four Houses	John Jackson, Architect, Barry-street, Bradford	A. G. Dalziel, Architect, 15, Commercial-road, Halifax	"
Halifax—Additions, Copley Mills	A. G. Dalziel, Architect, 15, Commercial-road, Halifax	John Hutchison, Carnamoney, Draperstown	"
Draperstown—House	John Hutchison, Carnamoney, Draperstown	W. Hopwood, Lower Barnes-street, Clayton-le-Moors	"
Clayton-le-Moors, Clubhouse	W. Hopwood, Lower Barnes-street, Clayton-le-Moors	Slate Works Office, Balvicar	"
Balvicar, N.B.—Ten Houses	Slate Works Office, Balvicar	Hipkiss and Bassett, Architects, Terrace-road, Aberystwith	"
Aberystwith—Shiloh Chapel School	Hipkiss and Bassett, Architects, Terrace-road, Aberystwith	J. Batting, 7, John-street, Adelphi, W.C.	"
Buckhurst Hill—Two Villas	J. Batting, 7, John-street, Adelphi, W.C.	Eyre and Southall, Architects, Gainsborough	"
Kirton—Minting, Warehouse, and Six Cottages	Eyre and Southall, Architects, Gainsborough		"

## ENGINEERING.

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Darwen—Railway Widening, Holdersden Junction to Dove-lane	Lancashire and Yorkshire Railway	C. V. Bangley, Secretary, Hunt's Bank, Manchester	" 27



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### OUR MODERN INTERIORS.

IN these days when the whole question of the architect's calling, and what he really ought to be and do according to ancient traditions, is being discussed with an intentness and thoroughness hitherto unknown, it is only to be expected that his services in connection with the interiors of buildings should be considered. The age we live in is nothing, if not critical. Gradually, through some vague idea that architecture was another name for archaeology, it has come to be thought that the professor of the art has only a very general kind of duty to perform, that he is not any longer the *archos tekton* or chief artificer, but a personage far removed from the functions of actual workmanship or building operations. Under the glamour of modern professionalism, the making of lucrative businesses with captivating titles, it was speedily seen that the architect must confine himself to certain duties and to external art, and to this end his special business was narrowed down to the external building, to matters of structure, though even in this sense limited to what may be called the decorative part of building, the preparation of elevations and details of particular trades. The gain to architecture by this division of his art is doubtful. The engineer has shared with the architect the structural part, and the decorator and cabinet-maker have each allotted to them the interior finishings of buildings. By these functions of the art being relegated to others, architecture has suffered a schism, and its real completeness has been sacrificed. Instead of one united intention being manifested throughout the building in the construction and decoration, discordant notes are observed. The engineer gives a conflicting note in his iron construction; his iron columns and girders and roofs are in complete variance with the architectural design, while the decorator and furniture manufacturer complete the discord by forming their own judgment quite irrespective of the claim of the architect to control. Such a partial view of the architect's work is contrary to all we know of ancient practice.

In the old days the architect conceived and carried out not only the building but the whole of the interior scheme of decoration, the furniture and accessories, with the aid of art-craftsmen upon whom he could rely in carrying out his design. For this purpose they worked in unison; they were appointed by the master builder himself, not as now by competition, invited by the employers, without even consulting the architect. In this manner the breach between architecture and the subsidiary arts has been widened. One important result has followed the handing over of the interior and all it implies to commercial art-workers and decorators. At first the architect appears to have taken the severance in good part. Forty years ago, before the revival in the industrial arts, the average architect entertained little respect for what we now call decorative art. He generally looked upon the cabinet-maker, upholsterer, and decorator's crafts as rather beneath his regard. Contented to leave such matters alone, an independent class of art workmen have grown up. In the mean time, a new spirit has been awakened. Pugin did a good deal to make the profession more Catholic in their views of what art really is—that it really meant all the trades that were subsidiary to architecture. And

the same belief in the thoroughness of this doctrine has made the profession anxious to devote more attention to the interiors of their buildings. More than this, in our time the architectural mind has again turned from the external to the internal. The Renaissance spirit, with its Tudor associations, the handsome fireplaces, panelled walls and ceilings, the carvings and frescoes and tapestries, the magnificent furniture and plate, have once more begun to kindle the enthusiasm of architect and decorative artist. People are not now content to live in houses like Italian palaces or Gothic abbey rooms denuded of every accompaniment save those of plasterers or furniture dealers, or amidst bare walls enlivened only by gilt-framed pictures and modern wallpapers. The soul of the artist has penetrated farther than these substitutes for interior baldness and poverty.

We have not only to look at domestic buildings, but our municipal and civic edifices and churches bespeak the same enthusiasm. In our newer churches, indeed, there is a strong desire to reduce the cost of the exterior, and to put all the highest art inside—a mode of procedure which is exactly the reverse of that which prevailed in the '40's," as anyone can see who goes inside one of our Early Gothic churches, with its plastered surfaces and often plain ceilings, and then compares it with a modern interior. And a like attention to interior finish and decoration is observed in all our newly-built residences, many of which externally are conceived in a plain vernacular brick style. It may be worth while, as a psychological problem of modern architecture, to inquire how this great change has been produced. To some extent it may be attributed to change of style or fashion; but there is certainly something deeper than this—a fundamental change in the meaning of art has taken place. Is it not that architecture is beginning to be associated once more with thought and emotions as the only true bases and motives upon which it can rest? Hitherto architecture has been practised as a means of reproducing old styles without any subjective basis whatever. The history of art has also shown that in every great epoch of architecture, the interior of buildings and the subsidiary arts of sculpture, carving, painting, and furniture have shared in the development. Beautiful building must make itself felt in the crafts which minister to the wellbeing of the age which produces it. We see this exemplified in every great era; the ancient Greeks not only produced the most refined and perfect buildings, but decorated and furnished them with schemes of colour fictile ornament of unsurpassed beauty. The ancient Etruscans and the Romans devoted their best talent to their interiors and decoration, and we know that in Mediæval times architecture did not stop at the outer walls, doors, and windows, but influenced and moulded every feature of the interior. Strange to say, though we have advanced a great deal, our architects still hesitate on the threshold, and that what we have, good or bad, of internal decoration and art, is not the work so much of the architect, as the manufacturer and decorator. One of our foremost decorative artists complains that architects do not go far enough; they stop at wall and cornice and woodwork, and leave the ceiling, frieze, dado, chimney-piece, grate fittings, and other matters to the shopkeepers. But it is easily explained. Such apathy or indifference on his part is mainly owing to the public desire for cheapness, which has been gratified by the commercial "art" tradesman aforesaid. He knows very well that the ordinary Mr. and Mrs. Smith still prefer to buy their "art" grates and "art" wall-papers and "art" furniture at the emporia, where they can pick and choose what they like out of a large assortment.

In a paper on "Modern House Interiors,"

read by Mr. T. Butler Wilson, F.R.I.B.A., before the Leeds and Yorkshire Architectural Society, the author alludes to the awakened interest in the artistic fitting-up of houses; that the public are willing and anxious to have the nearest approach they can to good art, and that they only look for someone to advise and direct them in their taste and selection. As it is, they go to the furniture dealer or decorator in the trade, who, of course, cares only to supply the prevailing demand and taste. No doubt this is partly true; but, as we have said, the desire for cheapness is paramount, and often as strong as the wish to possess good art. Besides, the "trade," the commercial "art" fabrics and wallpapers and furniture do equally as well, and give more pleasure to the average house-owner than the cultured and refined surroundings which the advanced school can enjoy. We are ready to admit there are now exceptional facilities open. Some of the large commercial art decorators are abreast of the time, and can supply goods of superior design and quality, and they have expended large capitals in employing the best decorative talent of the day; but they have still to contend against the temptation of all commercial artists to make their business lucrative. The architect has, therefore, to raise the standard of taste in these matters before any decided improvement can take place. He must begin to take more interest in the interior of his buildings, instead of allowing himself to be "bowed out" by the "art decorator" and furniture dealer. To do so he must begin to impress his client that his art extends beyond the confines of walls, floors, and ceilings; that it enters into the design and form of every object, from a mantelpiece to a coal-scuttle; from the decoration of wall and ceiling to the carpet and window hangings, and that such minute details as the contour of a table or chair-leg or the moulding of a door-panel are as much under his control as the design of a façade. Until this ubiquitous function of architecture is comprehended, it is useless to expect people to give up buying "art rubbish," or to display taste in their interiors. There are two ways which most indicate the entire disregard of this principle of the all-pervading influence of real art. One is the sad lack in the harmony of an interior apartment where we are likely to see French rococo, Jacobean and Japanese furniture and decoration jumbled up together; discordant forms and inharmonious colours everywhere meet our eye—one proof of the utter absence of all unity of conception. The average villa in the "genteel" suburbs of London is the most shocking instance of this, and Mrs. Bricabrac, in her love of odds and ends, is comical in her faddism.

A second characteristic of the modern decorative spirit is the want of the sense of proportion. A person fond of pictures will cover his walls with all kinds of easel pictures, landscapes, *genre*, or portraits, and destroy all the repose which well-chosen colour or wall decoration may afford. Another goes mad over china or old furniture, quite irrespective of the fitness of the room. The "art decorator's" crankism is just as obtrusive where we see an elaborate panelled ceiling of fibrous plaster, a heavy frieze filled with meaningless scrolls or stencilled patterns, an imitation dado of some embossed material, or a wall filling of flock paper of a pattern of the "nightmare" sort. It is just as easy to have too much furniture of a particular sort with nothing to display it to an advantage, or to go to extremes in fads like fitting up rooms like Turkish divans, or to indulge in a display of textile hangings and upholstery without the corresponding architectural accompaniments. This loss of the sense of proportion in decoration may be seen in many of our newly-erected hotels and West-End restaurants, where the decorator's "art" has obtruded itself with all kinds



of "art stuffs and fabrics," smothering entirely the structural lines and architectural features. What with the manufacture of "art" fabrics, costly restaurant and shop fittings, elaborate and showy metal-work in standards, grilles, and electric-light fittings, stained glass, and tilework, the architect's work in the interior is often reduced to plain plaster or paint. The interiors of our more important buildings have suffered the same encroachment of the commercial decorator. Sculpture, painting, carved relief, frescoes, and mosaics, and other of the higher forms of architectural subsidiaries have not yet been fully recognised either by public authorities or the profession as belonging to architecture, and there has consequently been no encouragement for those kindred crafts which at one time allied themselves to architecture. We have not now that traditional craftsmanship which found expression amongst the frescoists and painters of Mediaeval Florence, in churches and chapels clothed with frescoes, or amongst painters like Giotto or Mantegna. The craftsman of the 15th century, as we see him in his workshop, was a man of simple habits and dress, but absorbed in the pursuit of his craft, and full of enthusiasm, which he kindled in his own pupils and apprentices. Narratives of their life and work are given in Vasari, who describes graphically the interior of a Florentine workshop, next the master's own house, where design and work were carried on hand in hand, and assistants and apprentices, old and young, are engaged in various stages of carved panels, models in relief in gesso, and incrustations of saints sketched in charcoal by the master, and where the traditions of the art were preserved for centuries in the same family. Such were the conditions of a healthful and comprehensive art.

#### BUILDING ON CROWDED AREAS.

ONE of the problems which call for attention in our great cities is that of raising buildings of considerable height on confined areas. Such a problem presents itself in neighbourhoods closely packed with buildings like Drury-lane, Clare-market, Clerkenwell, and other crowded centres of habitation. The points of access, light, and air are of no less importance than structural matters like the foundations. As great blocks of dwellings are generally erected in rows along sides of streets, the idea of a central courtyard is out of the question. The entrances must be in the front, and these are generally narrow and cramped in the case of dwellings and shop premises, very often insignificant features in the exterior. What depressing monotony confronts us in most of our modern thoroughfares: doors and windows spaced off with mechanical regularity in a lofty flat row of street houses! Not even a porch or portico or recessed vestibule, so that in the long perspective the houses present a long succession of slits in the wall. How is it that building science and legislation combined have only led us to this pass? Modern architectural resource and invention appear to have been powerless to devise anything better where strict economy and utilitarianism are concerned. Look at many of our blocks of dwellings in flats: the Peabody and other companies' work for the housing of the labouring classes; those, for example, in Drury-lane, and in the neighbourhood of Clerkenwell. The plain square window with its sashes is the only kind of opening for light which suggests itself to the designer of buildings of this class; it is inexpensive, and the repetition of the same size of sash is an item of economy. But it is not so clearly apparent that they ought to be spaced at regular intervals, or that placing twos and threes of the same unit together is not more agreeable. Again, is not the casement form admissible, and why? Then, as to the

entrance, would it not be much more pleasing, and allow of a better architectural treatment if the entrances could be grouped—for instance, one large archway or vestibule to every two of the houses, each house or set of tenements having its own doorway within? The idea, we know, has been followed in some of the flat dwellings; but, as a rule, very imperfectly. By thus massing the entrances it is possible to accentuate them by an external break or feature in the front. It is quite possible to make a large entrance or arched vestibule interesting, where it would be absolutely useless to treat a succession of small ones. Access is certainly one of the points that has not been studied in our street design as it might be. The planning of the entrance too often follows the traditional rule: it is a slice taken out of the ground-floor rooms on one side. The French have better notions of doing the thing architecturally, in making vestibules.

Adequately lighting rooms in closely-built areas is still far from successful realisation. For warehouses and shops, large open windows are permissible; but these are not desirable for dwellings where any degree of comfort is to be insured. Attention to a few rules of design is seldom followed. Builders, and architects too, will put in windows that have no reference to the size or depth of room from front to back. For instance, what lighting power can be obtained from two ordinary openings 2ft. or more from the ceiling in a room 16ft. to 20ft. deep? Half the room would be in shadow, especially if the room is on a lower story, with the source of light at an angle of 50° or 60° to the horizon. Apertures for light in buildings on crowded sites ought to be proportioned according to this angle, and the larger openings ought to be placed in the lower stories. Very often we notice this rule is reversed. The profession in this point are too inclined to study elevation as apart from the question of lighting, or at least they do not think they are dealing with a problem exceptional in its circumstances. Most of the new dwellings erected for the working classes in London have the windows evenly spaced and of uniform size, as if the conditions of lighting were the same. Air and light are now insured to some extent by the 40th section of the London Buildings Act, where provision is made for the lighting and ventilation of habitable basements, but quite inadequate in the denser localities. The "courts within a building" (section 45), and the clauses which relate to open spaces for dwellings for the working classes not abutting upon a street, are means by which light and air can be obtained to some extent, but leave still much more to be desired. These statutory provisions are the minima, and ought not to regulate the promoters, owners, and architects of new buildings in our cities, though unfortunately owners are too apt to obtain all the advantages they can get, and regard their work simply as a pecuniary investment.

The foundations of lofty buildings is another question which has to be considered. The small narrow area or plot surrounded by large buildings on two or three sides presents a difficulty, especially when these buildings have to be shored up during the operation of underpinning or laying the foundations of the new building. Shoring takes up room, and seriously impedes the operation of forming the new foundations. We lately described an ingenious method of construction under these conditions adopted in New York, for supporting the adjoining party-walls. Slits were cut at intervals in the walls, and iron piles or cylinders inserted section by section, with bearings at the upper ends to carry the foundation wall, and these were carried down piece by piece to the rock bed and filled in with concrete, so the old party-walls were supported on a series of iron piles or stilts, thus avoiding any loss of

room by shores standing in the vacant site, and allowing the foundations of the new building to be laid and proceeded with. Where the cellar floor of a new building is at a lower level than the foundations of the adjoining premises—a very usual case—the above method is available, and is a usual one in New York, and has been adopted in a great building now erecting in Broadway. The adjacent building is supported in this way before the site is cleared of the present building. According to a recent writer, the work is carried on from the basement of the building to be removed without disturbing anyone by cutting openings through the walls to be removed, and opposite to each of the notches in which pipes are being sunk under the adjoining premises. The caisson method has been largely used for foundations in America. The soft underlying strata which exist at Chicago, or the fine sand which forms the substrata of portions of New York, has necessitated the use, as our readers are aware, of two principal methods—viz., to float the foundations on a steel grillage, and to build them on piles, or on cylinders, or caissons, sunk to the rock bed. The first plan is sometimes undesirable, because to float the building on grillages would cause the soft material beneath to escape laterally under the load, and therefore the architect is obliged to have recourse to steel caissons sunk by the pneumatic process, a plan that has been followed with much success in the construction of several important New York structures, like the Manhattan Life Building, the proposed Washington Life Building, amongst others. Of course, various kinds of caissons are employed, the method being to begin building a brick pier on the caisson preparatory to sinking it, this being done by entering the caisson beneath the pier by means of an iron tube and air lock, and cutting away the material below its under edges. By this undermining, the caisson is gradually lowered, and the material excavated is raised through the tube. Even the water difficulty is overcome by forcing air into the working chamber and then out by means of other pipes. By this process foundation work is reduced to a question of time and money, and considerable shoring and excavation is avoided. In London there is not the urgent need for these processes, as a good foundation can be obtained at a few feet from the surface, and by the aid of concrete. The main difficulty is, as we have said, the shoring and underpinning of adjacent buildings which occupy valuable space on the site. These are points that seem to call for more expeditious and exact methods of operations than those in use. The three points we have mentioned are often neglected in the usual preparations of plans and specification—the foundations, indeed, are generally left to the resources of the contractor, who is made responsible for any injury to the adjoining properties. At least, these problems have an important bearing on building in our cities, and ought to receive more attention.

#### PLASTERING, PLAIN AND DECORATIVE.

THE encyclopedic volume on this subject which Mr. Batsford has just published from the practical pen of Mr. William Millar\* well deserves its title as a treatise on the art and craft of plastering and modelling. It is a big book, including as it does an historical chapter by Mr. G. T. Robinson, F.S.A., besides a series of descriptions of the various tools, materials, processes, and appliances employed, not only for decorative work and so-called architectural dressings, but for structural concrete and fireproof stairs and floors and paving. There is a glossary and a set of recipes besides. Added to these are fifty-two full-page plates, and nearly

\* Plastering: Plain and Decorative. By WILLIAM MILLAR, Plasterer and Modeller. With an Introduction by G. T. ROBINSON, F.S.A. London: B. T. Batsford, High Holborn. 1897.





SGRAFFITO BORDER, IN TWO COLOURS.



SGRAFFITO RETABLE AT SOUTHPORT.—By G. T. ROBINSON, F.S.A.

250 smaller illustrations. The author has expended much care and many years' occasional labour in compiling his material for the perfecting of his work, the inception of which seems to almost have dated from the days of his apprenticeship. Indeed, the traditional methods actuating the writer must strike the reader in glancing over Mr. Millar's pages, and although we thus recognise his thoroughness and vernacular style in dealing with his subject, it must be acknowledged that the book might have gained by judicious compression. Its utility would, in fact, have been thus enhanced; but no doubt a skilful editor alone could have reduced the bulk of the volume without diminishing its practical value to the plasterer and craftsman. This fault, if it be one, of over-amplification has evidently been due to the desire of the author to leave no point untouched upon within the limitations of his subject, for Mr. Millar had the advantage of a rigorous apprenticeship to his trade, and so does nothing by halves, a merit in these superficial days which demands a fitting recognition.

Mr. Robinson's "glimpse" at the history of plastering makes a most interesting and valuable introduction to the whole subject. Its inquiry takes the reader back to the dawn of social life, until the origin of plaster-work becomes mystic and prehistoric. It is certain, however, that man very early in the history of the species discovered the secret of compounding material for plastering almost to perfection. In fact, some of the earliest plaster-

work which has remained to us excels, so far as we know, in its scientific composition that which we use at the present day, telling of ages of experimental attempts. Leaving, however, the Egyptian lime stucco and finer work of burnt gypsum, which was exactly the same as our "Plaster of Paris," and passing by Mr. Robinson's tersely-told account of the history of the subject during the Greek and Roman periods, we come down to the Middle Ages, when plastering existed only as a craft, and its highest function was to furnish a surface for mural decoration. With the dawn of the Renaissance a new era in the plasterworkers' art began, primarily in Italy, when lime-stucco was revived, and modelling in stucco became the vogue. "With the Vatican for a cradle, and Pope Leo X. and Raphael for its sponsors, its success was insured" . . . "Raphael left the completion of his decorative works to Giulio Romano and Gio. Francesco Penna, who, for the stucco portion of . . . allied themselves with Giovanni da Udine, its reinventor, and continued the work at the Villa Madonna, then being done for Cardinal de Medici, a cousin of Leo X., and who succeeded him as Pope in 1523." Amongst the illustrations accompanying these historical notes, in which the record so concisely told is duly verified by names and examples, Mr. Robinson has given a few of the Later Renaissance, including the stucco ceiling and wall decoration by A. Vittorio in the Palazzo d'Albrizza, Venice (1560); the famous stucco pillars in the courtyard of the

Palazzo Vecchio, Florence (1566) (see *BUILDING NEWS*, July 6, 1888); the stucco ceiling, Scala di Giove, Florence, by A. Vasari (1569); Vittorio's ceiling from the Ducal Palace (1570), and from France the stucco decoration and naturalesque figure modelling by Primaticcio in the Palace of Fontainebleau (1536).

In England, the plasterer's and pargetter's art and craft was used rather as a structural necessity, originating in the "wattle and dab" of the early Middle Ages. This in time began to be ornamented, and at Clare, in Suffolk, is still to be seen an example of 15th-century work of this kind, with figures and scrolls. Other specimens could be mentioned, as at Lavenham, Wyvenhoe, and Long Melford. The more famous house at Maidstone (see *BUILDING NEWS*, April 7, 1882), has been demolished, unfortunately. In 1501 Henry VII. granted a Royal charter to the Guild of Plasterers, a now important body and growing in influence. The English soon acquired the operative lessons taught by the Italians, adapting the foreign methods to British uses. The exigencies of English houses were, however, different from those of Italian palaces, so they fitted their work for its purpose—a purpose never applied to any other country—that of covering a flat ceiling in a room of moderate height with a suitable plastered decoration. From Longleat and Hardwick Halls, early instances and entries are quoted, and drawings are given from Losely House, Guildford (1562); Cooper's House, Great Yarmouth (1596); Peartree's House in the same town, and



another in South Quay; Bramshill, Hants (1603); Audley End (1610), Boston House (1623), Craigievar, Aberdeenshire (1611), Moray House, Edinburgh (1618), Wintoun House, Midlothian (1620), Holyrood Palace (1671), and Sparrow's House, Ipswich (1683). The chapter closes with references to the decline of the art of plastering towards the end of the last century, when the ornament was cast, and stocks of moulds became the dull, stale, and lifeless prettinesses then in fashion. Adam "brought death into the world," so far as the fine old art of plaster modelling was concerned, though clever "compo men" assisted in its obsequies. The last stucco modelling *in situ* done in London was, perhaps, the ceiling of the now demolished Hanover Chapel, Regent-street. "The principal object of this chapter" (says Mr. Robinson) "is to show what great artists have aforetime been the votaries of art in plaster-work, and to induce those of our own day to try and revive the higher ambitions of the craftsman of an art and craft which has such an important history, to raise it again to its former eminence, and to be no longer content with covering the sins of the jerry builder with a charitable, but very plain, coat of indifferent plaster." We have selected two illustrations by way of showing a sample or two of what Mr. Robinson himself has done in the direction thus indicated. The first is part of a retable executed at Southport in sgraffito, from cartoons by the late Harry Burrows, the actual work being the craftsmanship of Mr. Wormleighton, who for many years has carried out all Mr. Robinson's sgraffito work. The second cut shows a sgraffito border in two colours—a bold and effective pattern composed of peacocks.

That plastering is likely in the near future to be more used than it has been during the past century in works of the better class, from designs by artists who can model and work in the material itself is, we think, most probable, both for external as well as internal purposes. The ungainly employment of Roman cement and Portland stucco by ignorant speculative builders not to mention the thoughtless use of cast ornaments, so called, spoiled the chance of a most durable and suitable material for many years, while, of course, the spirit of the Gothic Revival was rightly inspired by a hatred of all shams, such as those in this way associated with plastering. The ugly colour of Portland cement too, is fatal to its use architecturally, without stains or painting. Stone-lime stucco, on the other hand, is quite different, and its warm cream-colour withstands the soot and weather almost better than any stone, while *stucco duro* leaves nothing to be desired. We cannot attempt to epitomise Mr. Millar's volume, which will take its place as a valuable and reliable book of reference, copiously illustrated and strongly bound. If we read him rightly, he makes no claim to artistic qualifications; but as a plasterer, rich in the traditional knowledge of his calling, and thoroughly qualified to explain its methods and practical details, he has thus contributed all he knows for the information of those who may have to design or use plaster in its many varieties, be they artificers, architects, or artistic modellers and craftsmen in the higher sense of the word. Certainly no such complete a book on the subject has hitherto been published, and, moreover, it is not a book of patterns.

#### "BUILDING NEWS" DESIGNING CLUB.

##### A COUNTRY HOUSE FOR A GENTLEMAN.

IT would be an affectation to assume that we are satisfied with any of the designs submitted for this subject, although so large a number were sent in. Competitors may naturally enough urge that we nearly always qualify our approval of their efforts; but, on the other hand, it must be admitted that we seldom fail to recognise their good points, and we never hesitate to offer commendation where it seems to be really deserved. A country house to cost about £5,000 is necessarily a moderate undertaking, and the conditions of the problem are correspondingly within a restricted compass; indeed, the subject is decidedly an attractive one. The results in this instance, however, do not equal the occasion, and an absence of really clever designs has left us no alternative but to preface these remarks in this way when illustrating the two plans herewith published for the first and second places. The conditions were as follows:—

"A small country house for a private gentleman,

to cost about £5,000, and situate in a hilly district on a site having a fall from east to west of 1 in 12. The entrance front is on the north side. The prospect is towards the south-west. The house to be on three floors, the upper rooms being contrived in the roof to some extent. Material, brick with hard stone sparingly used. Style to be English Renaissance. Accommodation to comprise hall, dining-room, drawing-room, billiard-room, and 'own room' on the ground floor at least. A day and night nursery necessary, and a breakfast-room would be a convenience if it can be economically introduced. On the first floor five or six bedrooms and four on upper floor. Back stairs desirable. The main staircase to be 4 ft. wide, and so placed as to be out of view of the entrance. Good kitchen and offices, housemaid's closet, two baths, and three w.c.'s. The problem is how to arrange the accommodation in a practical and artistic manner with convenience to the occupiers, and not overlooking the sum at the designer's disposal. Three elevations, one section, three plans, and view. Scale for elevations 8 ft. to the inch. Other drawings may be to one-sixteenth of an inch. A perspective sketch desirable."

As to how far the chosen plans by "Alfio" and "Nap" have met these requirements may be seen by the accompanying illustrations, and it is evident at a glance that a somewhat wide construction has been put upon the condition as to the style being in the English Renaissance. The limit of cost also could not be too rigidly enforced, and in arriving at an award, it is imperative to take one thing with the other in order to make a fair choice. "Alfio," placed first, shows no little originality in the contrivance of his plans, though we cannot say that the position of the fireplaces, more particularly that in the dining-room, are well chosen for comfort and convenience. The level of the passage from the kitchen must be higher than the dining-room floor, because there are four steps up to it, off the quarter space of the main staircase; but "Alfio" has not realised the necessity of a similar number of steps down from the passage into the dining-room. They would, of course, be very inconvenient in a service way. The hall is a nice feature, and the gallery above would give a pretty effect, though we scarcely admire the treatment indicated by the section. "Alfio" does not draw out his design carefully enough: see how ungainly the main entrance looks with the panel over the arch depicted out of the centre. The perspective sketch, too, is careless, and not helpful to its author or interesting to others. He is fairly mindful of the limitations of cost, and has given us a house devoid of vulgarity, a picturesque building unconventionally handled and conveniently arranged. The chimneys are not well managed, and we are aware that other faults might be pointed out; but the plans speak for themselves. "Nap" is more dignified in the massing of his elevations, and more ambitious in his plan, which has distinct merits of its own even if it be more costly than the last. There is a crowded effect in the fenestration of his garden front which mars its breadth, the west elevation being better in this respect. The relative uses of the reception-rooms appear to be overlooked somewhat. The drawing-room in shape and contrivance is planned more as a dining-room with the recessed fireplace giving good space to get round the festive board. The dining-room, on the other hand, is fashioned more as a parlour where furniture may be grouped for ladies' uses, and a table for dining would seem out of place in it. Its position, of course, in respect to the kitchen renders its use as a dining-room imperative. The third design has a commonplace plan which would require reconsideration in many details to inspire it with any degree of character, and yet externally the design has much worthy of commendation, we think, in spite of the conviction that "Idristwyn" has imported features into his scheme somewhat in a ready-made kind of way. The good big broad chimney from the billiard-room in itself makes a point of value, but the ingle-nook little windows are too high up to serve their purpose, which primarily should be to afford a garden peep from the room. The three gables grouped together on the same front are quiet and pleasing, though the circular bays hardly belong to such a crowning arrangement. The balcony over the bay of the billiard-room can only be reached by jumping out of the day nursery window. The perspective quite misses the idea of giving a house something like suitable

surroundings, for the author has delineated this building as if it had been pitchforked on to the sides of say some lone spot among the Sussex hills. "Idristwyn" will with industry improve, and it is because we wish him to do this that we have in this way remarked upon his designs to-day. He requires more study in working out his ideas, and the most simple plan generally is only arrived at by a close attention to detail. "Pickles" in a minor and even remote way has taken the old English *U*-shaped plan as a model, making an arrangement of the rooms in so careless a fashion as to deserve the charge of crudity, wasting space without securing dignity or comfort, a patchwork type of planning much to be condemned, with cramped and narrow doorways in the immediate corners of the best rooms. We had expected a better design from "Pickles" than this, for which we cannot give him much praise. His entrance porch is the best feature in his façade, but it is only an indifferent copy of an old portal. "The Dingo" has endeavoured to realise an Elizabethan house externally grafting on a modern plan, and, as might be anticipated, the elevations are far better than the interior arrangements. The author, nevertheless, must have some sense of the picturesque, or he would not have drawn so good an entrance porch, even although it is somewhat a copy. Why then does he drop to the baldest of ideas in contriving his plan with its long, dreary tunnel of a passage, devoid of all notion of a pleasing vista?—in fact, it ends with the store-room door! The elevations claim dignity as their own, a quality utterly lost sight of inside the building. "St. Leonard" ignores the breaks in his plans when drawing out his elevations, and it is clear that he has much to learn before he can plan a convenient residence. The loggia is a nice feature when skillfully introduced in a house of this class; but there is no reason whatever why a billiard-room should be so exceedingly ugly or the approach to it made as if it were an afterthought. "St. Leonard" has an appreciation of breadth, and his notions are distinguished by a degree of good taste; but he has no knowledge of perspective, and therefore spoils his work entirely. His plans are very crude, too. "Tyke" over-looks his elevations, and over-corridors his plans. Taking passages and halls together, the administrative parts of the house are unduly ample, and, besides, there is no corresponding gain either of dignity or convenience. "Tyke" has spared no effort to do his best, and we are not in the least overlooking his merits, which suffice to show that he is likely to do better. His design is lacking in concentration, and its parts are too little considered as belonging to a whole, and the same want of idea is conspicuous in his plan. "Cheese" is much better in this respect, and, if he is a trifle more ordinary, he certainly imparts a sense of design to his façade, grouping his fenestration and balancing his gables and other leading features. The canted bay does not make a convenient porch, and the approach to the master's own room through the cloak-room is not a nice contrivance. The master's table must be located, too, between the door and the window in a direct draught, and the ingle nook-screen dividing a room, 14 ft. by 13 ft., into two-thirds of its area is a mistake. The billiard-room on a lower level, owing to the fall in the ground, shows skill and forethought. The reception-rooms are well-planned in several respects, and the drawings by "Cheese" are carefully executed. It is a matter of regret that he does not impart a little more feeling into his work. "Nut" is unequal and uncertain; a desire for quaintness mars a more sober judgment, leading him out of the way to indulge in distorted lines and unfinished carelessness for the purpose. His house is quite unlike an Englishman's home; but we are prepared to admit his ability and endeavour to insure the picturesque, both in plan as well as elevation. At present the result is ugly and wanting in repose; moreover, his elevations do not always agree with the plan. "The Wolf" is careful, and has some regard to the £5,000 at our disposal. His garden front is almost a success. The main gable would have been better central, between the two big chimney breasts. A billiard-room, 12 ft. wide, is of no use to anybody—it might do for bagatelle. The dining-room is too isolated from the kitchen, necessitating the dinner having to be brought in front of the entrance into the staircase-hall, thus crowding the service in the way of the guests. "Vlan" draws very badly, and fails to do himself justice. The fireplaces in the two principal rooms are enough to condemn any plan. There



is, however, an ability in the elevations which makes it a pity "Vlan" does not take more pains and work a little more seriously;—8d. a cube foot is not enough money for pricing out such a building. "Argon's" garden front is rather pretty, but the perspective displays an ungainly-looking group. The plans are very rough, and wanting in study. "Baron's" design is villa-like and unpretentious, and he sends a plan which we praise for its compactness; in detail it will not stand those tests which experience renders inevitable. The ceiling over the cloak-room in the well of the staircase is a point of this kind—a regular dust-trap, always in evidence. The design externally would look poor and thin in execution. "Pantile" revives diagonal brickwork in his design, which has elaborated chimneys and shaped gables. There is no perspective sketch. "Geisha" runs a corridor through the middle of his house, and makes a somewhat nondescript elevation towards the garden. "Shield" draws with a rugged line, and in parts his work seems to suggest a sense of quaintness; but he is more queer than good, and more careless than skilful. "Percy," on the other hand, spares no pains, but we cannot praise his design, with its conical-roofed tower and central hall with a domed light over. A more uncomfortable room than the drawing-room it would be difficult to conceive. "Pickwick" hardly calls for comment, and his drawings do not do his design justice. "Triangle," on a card, contrary to rules; "Datum," "Too Much Trouble" (evidently), "The Manxman" (four sheets), "The Mammoth" (bald and poor); "Don't Know," "Mist," "E. G." (rather better in some respects than the last few), "Look" (your perspective is shockingly wrong), and "Charley's Aunt" (too much time expended in lining up the perspective).

#### CONSTRUCTION OF ARCHES IN CONCRETE.—IV.

BEFORE proceeding to a detailed consideration of the various modifications of the compound or combined system of constructing arches in concrete, some general results common to all experiments undertaken with the object of determining their powers of resistance may be appropriately referred to. In the first place, when an arch of any material is subjected to the action of a gradually increasing load, the deformations or alterations of form increase proportionately to the augmentation of the load. This increase, or rather this proportional increase, does not, however, remain constant up to the point of rupture of the arch if the trial be pushed to that extreme point. After the loading has reached a certain amount, should it be still further added to, the subsequent deformations increase in a far higher ratio than the rate of the augmentation of the load; in a word, they no longer obey Hooke's law, which may be described, and is generally known, by the title of "*Ut tensio sic vis*." It has been already stated that the arches quoted in our previous articles showed, as might be anticipated, different degrees of deformation, accordingly as they were constructed of one material or the other; these deformations or deflections are best exemplified in all instances by a diagram. A diagram adapted to the results of the experiments made upon the arches, having a minimum span of 4ft. 6in., of which we have recorded the particulars, is shown in Fig. 1, which will require a brief explanation to make it intelligible to our readers. To avoid confusing the diagram, we have selected only four out of the seven actually tested. They are lettered A B C D, and represent the deformations respectively of (A) arches built of ordinary bricks with longitudinal joints, (B) of arches built of the same description of brickwork, but with annular joints, (C) of arches built of concrete, and (D) of arches built of a special pattern of brick. The figures 1, 2, 3 . . . 9 denote tons, and the figures 1, 2, 3 . . . 13 signify tenths of inches; in other words, the horizontal row of figures represent the successive loads laid on the arches, and the vertical row the deflections or saggings corresponding to the several loads. The method of using the diagram is as follows:—Let it be required to ascertain the deflection of the arch constructed of concrete when under a load of four tons. From the point 4 on the lowest horizontal line of Figure 1 run the eye along the ordinate 4—4, and from the point *a* where this vertical ordinate is intersected by the wavy line *oc*, draw the dotted line *a2*; the length of the intersected ordinate 4—*a*, will give the deflection, which will

equal .23in. Again, suppose the deflection of the arch, built of ordinary bricks with longitudinal joints under a load of 5½ tons was demanded, we proceed to obtain it in a similar manner. Bisect the distance 5—6 at *b*; draw the ordinates represented by the dotted lines *bc* and *c—5*, then the length of *bc* or its equivalent *oc* measures the deflection required, which amounts to .525in. It is obvious that by increasing the number of either or both vertical and horizontal ordinates—that is, decreasing the distance between them—any degree of subdivision of both the loads and deformations can be obtained; that is to say, the

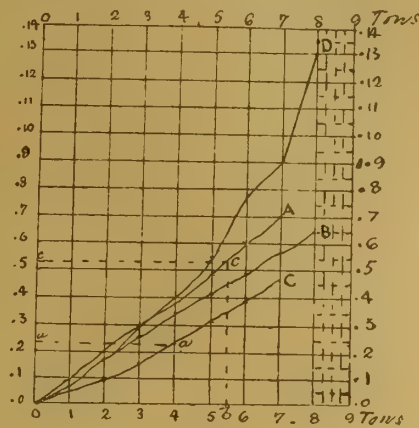


FIG. 1.

diagram can be "made to read," as the proper phrase is termed, to any reasonable minimum degree of accuracy that the experiment might call for. As an example, let the diagram be arranged to read to quarter tons and ½in.; the area of the interval between the figures (8-8.0-9) would be in that case divided, as shown by the dotted lines in Fig. 1.

It will be observed that while the diagram very clearly indicates at a mere glance the comparative deflections due to the imposition of certain loads upon the arches, it does not absolutely record them; for this purpose a table is necessary, which may be compiled from the diagram itself, or from notes of the original observations from which the diagram was plotted. The young beginner and student will find it useful to prepare such a table, as it will serve to enable him to compare the results of the actual deflections deduced from the above experiments with those which will successively appear in future articles. We give a form of table embodying the results arrived at in Fig. 1, which will, we think, be readily intelligible. There are a number of different ways of compiling tables of this description, but so long as any one of them affords the information required it is immaterial which is employed.

TABLE.

Index letter of arch.	Loads in Tons.							
	1	2	3	4	5	6	7	8
	Deflections in decimals of an inch.							
A	.07	.18	.30	.37	.48	.60	.70	
B	.07	.18	.26	.35	.42	.48	.56	.65
C	.05	.08	.15	.23	.32	.38	.46	
D	.10	.20	.30	.40	.53	.77	.99	.13

An examination of the table will show that Hooke's law is approximately followed by all the arches up to a certain point of loading; in fact, the arch D, or the specimen built of a special



FIG. 2.



FIG. 3.

description of brick, adheres to it rigorously until the application of the fifth ton of loading, when the divergence becomes apparent.

It has been observed that in the majority of the experiments in connection with the testing of arches of concrete, whether simple or compound, the cracks and small fissures which inevitably accompany these trials, generally make their

appearance at certain definite points in the structure, whose *loci* do not vary much in different tests. Now, theory points out that there are also certain points in the body or mass of the arch which possess a less power of resistance than the rest of it; these are, therefore, the weak points, or, as they are technically called, the weak or dangerous sections of the arch. It is satisfactory to find that in the examples recently experimented upon there occurred, with respect to the position of these dangerous sections, a very close agreement between theory and practice—much closer than ordinarily prevails. Attention will be subsequently directed to this interesting and equally important coincidence, and the necessary rules and calculations will be given, by means of which the position of these sections can be determined *a priori*. To a certain extent the fissures, as might be expected, are developed approximately in proportion to the surcharge; but a great deal depends upon the description of the material used, how it is made, of what ingredients it consists, and especially the time the concrete has been allowed to set previously to the commencement of the testing operations. It does not necessarily follow that the yielding or fracture of the arches should always take place at the weak points, because, these very points being known, the contingency can be guarded against by the addition of more material—that is, by increasing the sectional area in their neighbourhood. The readiest manner of accomplishing this would be by slightly increasing the depth of the arch in the interior, for the discrepancy could not be allowed to become visible upon the faces of the arch, which must be either of a uniform depth or of one increasing from the crown to the springings. The manner in which two of the second largest arches failed, both of which had a span of 9ft., a rise of 1ft. 1½in., and a depth at crown of 2in., is shown in Figs. 2 and 3; the example in Fig. 2 was built of Monier cement, and that in Fig. 3 of Monier cement-concrete. In each instance it will be noticed that fracture occurred at three points, whereas in the arch constructed of corrugated iron the failure took place just at one side of the crown.

Independently of the character of the design or of whatever system may be adopted for the structure, there are several methods of actually placing the concrete *in situ*; it may be deposited in successive layers concentric with the curvilinear contours of the arch, or it may be laid on *en bloc*, in regularly increasing aggregations upon each semi-arch; or, again, as was the method employed in building the Coulouvrenière Bridge, the material may be gently tipped so as to approach in setting the wedge-like form of the ordinary voussoirs or ringpans. In the last mentioned instance there will obviously be radial joints in the arch itself, not perhaps so clean or clearly defined as if the arch were built either of ashlar, masonry, or of brickwork, but roughly approximating to that condition. The practical and useful moral to be derived and adhered to from the facts recorded, and the statements made respecting the dangerous sections, is that they should never, unless absolutely unavoidable, as sometimes will occur, be permitted to be coincident with the lines of the radial joints of the arch. The most judicious position would obviously be about midway between any two successive joints; if this arrangement could always be effected it would greatly tend to limit the development and subsequent extension of cracks and fissures. Experiment has demonstrated that these occur long before the final rupture of the arch takes place, and, unless of a serious character, or until they become so as the loading increases, are not necessarily to be regarded as evincing any abrupt failure of the structure; as a matter of fact, slight cracks or "threads" make their appearance in every description of arches and walls upon the application of comparatively a very small load in proportion to their powers of ultimate resistance. Frequently wear and tear and the lapse of time bring about the same contingencies, but a little careful pointing and plastering will remove the apparently dangerous aspect of the structure. However superficial the cracks might really prove, it is the "look of the thing" which frightens outsiders, and however mistaken their views may be respecting the security of the work, yet some deference should be given to them. Whatever may be the ultimate breaking load of an arch constructed of concrete, it is evident that when the cracks, fissures, and deformations become of proportions and dimensions sufficiently large to render the failure of the arch



certain after the application of further loading, then the value of the factor of safety, or safe working load per unit of area should be based, not upon the actual crushing load, but upon the preceding one, which has weakened the arch to such a degree as to render it practically useless. In the experiments upon the arches of which the results have been recorded, the co-efficients of elasticity were determined from the value of the vertical deflections and other necessary known data. If we represent, then, by unity the co-efficient of elasticity of the arch of brick B, and designate the stone arch by S, that of concrete by C, and that of Monier cement by M, we shall have the following relations:—

$$M = 12 B. \quad C = 9 B. \quad S = 2 B.$$

While deferring for a future article the trials conducted upon arches of concrete and cement of a span very considerably greater than the preliminary examples to which we have directed the attention of our readers, we shall give the particulars attending the testing of an arch constructed on the Melan system, which we have already classed under the category of the compound or combined methods. It will be as well, as the principle which governs all the designs recently enumerated is in reality a common one, to adduce some further information of the Melan design, as it comes first in the order of rotation. This system takes its name from that of the inventor, Mr. J. Melan, who has constructed several bridges in Europe on this pattern; the general construction of this principle will be apparent from the drawing in Fig. 4, in which the rolled steel joists connected under every bent steel arch by the tie-rods T constitute the frame and *points d'appui*, upon which the whole design rests. At intervals, varying from every 3ft. to every 5ft., steel ribs A, in the shape of small, shallow, rolled joists, are imbedded or literally buried in the body or mass of the concrete, and there is not the slightest

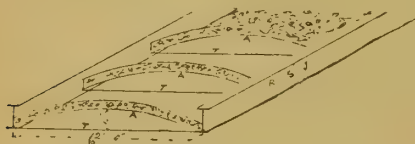


Fig. 4.

doubt whatever but that the strength of the compound structure largely depends upon the employment of these ribs, and also to some extent to their number in any given length of the arch. Practice has pointed out that, according to the length of the span, rise, loading, and other conditions, which may be general or exceptional, so must the spacing of these steel ribs be regulated. In Fig. 4 a portion of the superincumbent concrete is removed in order to display the manner and distances at which the steel-arched ribs are located. It should be observed that although the example selected for illustration in Fig. 4 does not exceed the comparatively modest span of 12ft., yet bridges which will be investigated in future articles far surpass this limited length of bearing: it has passed beyond the incipient stage of arches of 12ft. to 18ft. span designed solely for the flooring of the different stories of the "skyscrapers" of the United States. That this system possesses a considerable saving in dead weight and cost is incontestable; but, on the other hand, as is invariably the case, there are attendant disadvantages which are stated to more than nullify them. It is contended, and theoretically considered with perfect truth, that the concrete, not only in this, but in all the combined systems, has a double duty to perform. In the first place it lends its assistance in sustaining a large, in fact, the largest portion of the compression to which the arch is subjected, and at the same time it has to act the part of a horizontal beam or girder stretching from one curved rib to the other. If this assumption be accepted, it follows that the extradosal flange of the concrete girder would be in compression, and the intradosal flange in tension. Assuming for the moment that the theory of a flanged girder would hold good under the conditions prescribed, we should fall into the error, which is to be studiously avoided, of placing a part of the concrete under a stress of a tensile character. It must be borne in mind that this allegation affects all the systems ranging under the category we have allotted to them. It remains to be demonstrated how these

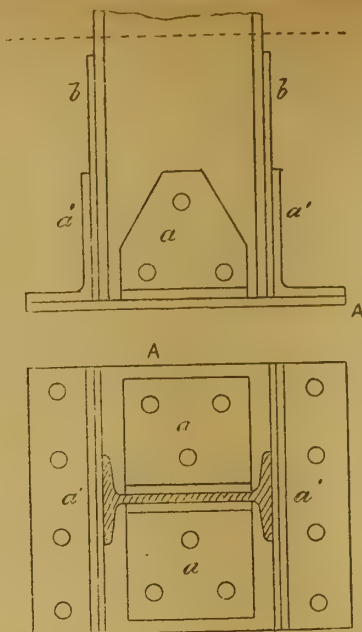


Fig. 54.

criticisms, which are well worthy of consideration, are to be encountered and satisfactorily disposed of. This is only to be accomplished by a careful investigation of the arguments put forward, and an accurate analysis of the experiments made by the advocates, both at home and abroad, of the combined system of arches built of concrete.

#### WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XV.

WITH the exception of the Phoenix column there is no pillar of circular section obtainable by the use of rolled sections. Large

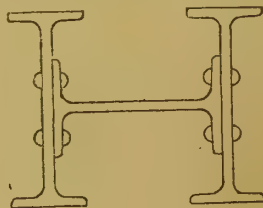


Fig. 55.

columns of circular section are frequently used; but these are built up of plates bent to segments of the circle, and united by means of covering strips, tees, and angles, the latter acting as stiffeners. Such columns are often filled with concrete, making a solid mass. Caissons for sinking foundations are built up in similar fashion. But, with these exceptions, all members intended to do duty as columns or stanchions are

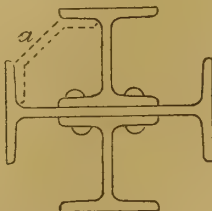


Fig. 56.

built up of rolled sections, which are either of, or allied to, plain rectangular forms. With joists, channels, flat bars, and angles, nearly every combination required in ordinary construction is possible. Without attempting to embrace all possible forms, illustrations of a few of those most common and most useful will indicate the wealth of selection open to the designer and contractor. The plain rolled joist is at once the simplest and cheapest column possible. Combinations of such joists are almost equally simple and cheap.

The breaking loads on joists used as columns, of any given sections and lengths practicable, are tabulated by the houses which supply them. The joists are admirably suited for the attachment of feet, and of girders, and bracings.

Fig. 54 shows how the foot A is riveted to a joist used as a pillar. Forged knees, or angles, *a a, a' a'*, are riveted both to the joist and the foot. Additional stiffness is afforded on the narrow flanges by the interposition of web plates, *b b*, between the angles and the joist flanges. Such a pillar can, if necessary, be closed in with timber, and made to assume an ornamental appearance. The form is not the most desirable, because it is only in one or two small sections of joists that an area of square section can be obtained over the extreme edges. To obtain such a section in large dimensions with joists only, three joists are riveted together as in Fig. 55, or alternatively as in Fig. 56. The former is slightly stiffer than the latter, but the latter has two rows of rivets less. The symmetrical arrangement of

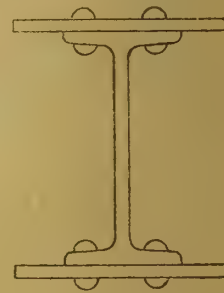


Fig. 57.

the flanges on Fig. 56 is very well adapted for the attachment of girders, &c., and of angles or knees for riveting to the foot. Stiffening ribs also can be riveted up at intervals, as indicated at *a* in Fig. 56.

A very common form of pillar is shown in Fig. 57, comprising one joist and two flat bars. It is cheap, and well adapted for bracketing and for attachments.

Fig. 58 is like Fig. 55, but stiffened materially by the introduction of bars *a a*, which present also broad flat faces. The bars are seldom continuous, because such an arrangement would prevent access to the interior. In fact, in most cases, *a a* would consist mainly or entirely of diagonal cross bracing, so that the column would be practically open on the sides *a a*, and closed only on the sides *b b*. At bottom and top, or at intermediate places to which other work has to be riveted, plates or bars of the required width are used.

Channel bars used alone, or in combination with other sections, form cheap columns. Fig. 59 shows an arrangement of four channel bars; Fig. 60, one of two channel bars and two plates; or



instead of plates, bracing bars as in Fig. 58. Fig. 61 is a combination of two channels and a joist. These are good columns, and the choice of either in preference to the other is a question of special requirements.

The type of bracketing shown in Fig. 54, for

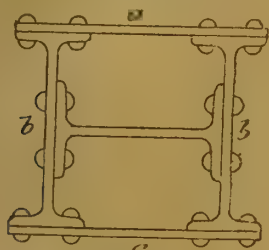


Fig. 53.

the foot of a pillar of rolled joist section, is suitable in the main for the base and cap of any of the other built-up sections shown in succeeding figures. Having broad faces for attachment, brackets like *a* in Fig. 54 are simple and convenient. With narrow faces only, stiffening plates like *b* are necessary in order to afford a broad surface for steady attachment, and to

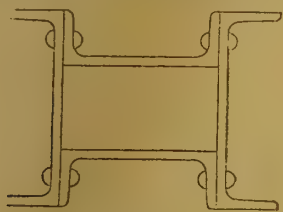


Fig. 59.

compensate for the loss of strength due to rivet holes. In cases in which the columns are very long, and the bases or caps broad, built-up angle brackets made of plate and angle are necessary. Examples of these will be illustrated later. When the bracketing is of the form shown in Fig. 54, unequal angles can generally be obtained with flanges of suitable widths, or if not, forged knees

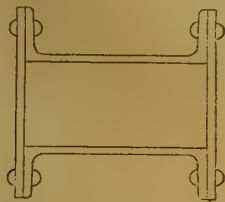


Fig. 60.

are used, and these are then generally made of a tapering section—thicker at the roots, and tapering thence at the outer edges.

Thus, without using a bit of angle or tee section, eight very useful columns are obtainable in a very wide range of dimensions, bounded only by the limiting dimensions alluded to in recent papers. For Figs. 54—58, and Fig. 61,

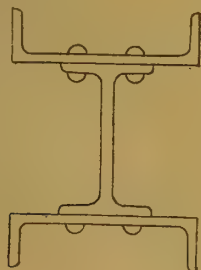


Fig. 61.

joists are available in dimensions ranging from 3in. by 3in. to 20in. by 7½in. In most pillars of these types also the sections available permit of the imparting of almost any given proportions to the built-up cross section, either square or oblong, as most desirable in any given cases. In all of them the maximum result is obtainable with a

small amount of riveting. There are few joints to level by hammering, or to true up by planing, and the elements of uncertainty due to workmanship are diminished. The limitations, however, to the dimensions of these joists and channels used in pillars, is about 20in. square in cross section, and 20ft. in length. When these dimensions are to be exceeded, then other methods of construction have to be adopted. But there is another aspect of this subject, besides the mere fact that much work lies outside the limiting dimensions, and must of necessity be built up by the aid of the other sections, angles, and tees, with plates. It is this: That as the larger columns are approached, the constructions shown in these figures are not the best possible. That

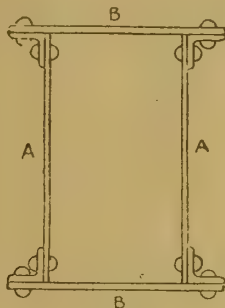


Fig. 62.

illustrated in Fig. 59, for example, is open to the objection that it is entirely and forever boxed-in, permitting the ravages of rust to go on unchecked. The same objection applies to all pillars which are built up by duplications of joists and plates, or of channels and plates, the portions between adjacent joists or channels being closed. Neither are the sections shown so suitable for long columns as those which are built up more elaborately. In the first-named, the metal is massed as solidly at and about the neutral axis as elsewhere, and generally the disposition of metal is not the best on the whole. The sections which are built up of rolled joists and channels have this further disadvantage—that the strength for a given combination cannot be sensibly increased by increasing thickness, because increase in thickness only affects the web and not the flanges, and any increase in web thickness does not add to the strength in the same proportion as increase of thickness in the flanges on the exterior surfaces. There is no advantage even on the score of economy, in using sections like these for heavy pillars. As weights increase the extra cost of metal over and above that necessary



Fig. 63.

for strength—metal much of which is improperly distributed, approaches that due to cost, both of metal and of labour, in platers' work in a better designed pillar. In cases where lightness of appearance is a consideration, as in markets and supports for light roofs at railway-stations and sheds, the pillars not being inclosed or concealed, a braced structure like that shown in Fig. 65 is much to be preferred to a pillar of section bars.

Another point is that pillars built up, as in Figs. 65, 66, can be made of either tapering or of parabolic outlines, while pillars built up of joists and channels must needs be parallel throughout, and this will often outweigh any consideration of difference in cost, the tapered or parabolic outline corresponding with the nature of the stresses

imposed, besides having a much more graceful appearance.

The best columns, therefore, are those which are built up by the aid of angle sections, the main elements comprising plates and bars; the weight of metal is thereby lessened where it is least



Fig. 64.

wanted, and lightness, both absolute and in appearance, secured. The continuous webs in Figs. 55, 56, and 58 would seldom be introduced into a large built-up pillar, but metal would be massed at and near the outer faces.

Fig. 62 shows a typical example of a built-up pillar, comprising two webs, A, and two flanges, B, united with angles. Both webs and flanges may be of continuous plate; but it is better to leave openings in the flanges B, or, instead of flanges, to use lattice bracing. Moreover, BB could not be made continuous, unless the section were large enough to permit of a man or boy getting inside to hold up the heads of the rivets that come within; the same remark holds good with regard to the webs *a*, *a*, and rivets in Fig. 58.

Square pillars are often built up of angles and lattice bracing only—Figs. 63 and 64. In Fig. 63 ordinary angles are used, and the bracing is riveted outside on all four sides; in Fig. 64 round-backed angles are used, and the bracing is on the inside—the latter is preferable in most cases. The lattice bracing is carried round four

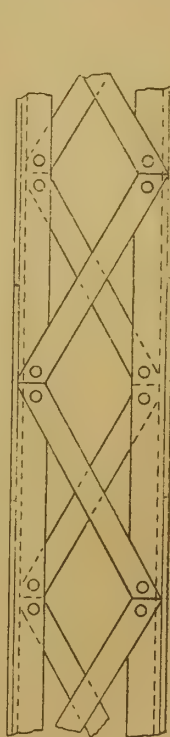


Fig. 65.

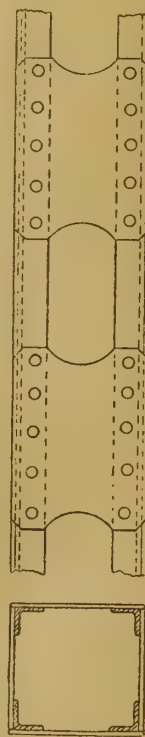


Fig. 66.

sides, and it may be single (as shown in Fig. 65) or double, the bracings crossing inside and outside each pair of angles, and being riveted where they cross with a distance-piece between; instead of diagonal bracing, plates are also used, as in Fig. 66, to connect and tie the angles.

Most of the larger pillars are developments of the foregoing. If, for the flanges in Figs. 54—61, we substitute angles, and for the webs



bracings, and if, further, some of the simple elements are multiplied, then the way in which many pillars of the most massive proportions are built up is simplified. J. H.

### NEW IDEAS IN CERAMICS.

FEW things have been more interesting in recent years than the extended use of ceramic materials for architectural decoration and construction. The opportunities of introducing effects of colour in permanent pottery materials have been largely welcomed by architects, and yet not as much so as might have been expected or desired. Perhaps this may be due to the fact that it is not always easy to bring new ideas to the notice of those most likely to appreciate them. It is certainly difficult for anyone to realise the effect of a decorative scheme from the casual inspection of an isolated fragment of it.

It is with this thought in mind that Messrs. Doulton and Co. are now arranging in their show-rooms at Lambeth, a fairly complete display of what they have been producing recently in architectural materials and sanitary construction. The works on view make it evident that in decorative materials Messrs. Doulton and Co. are endeavouring to provide the widest possible range of colour and texture.

The coloured salt-glazed ware (in its earliest form as applied to pottery bearing the distinctive name of "Doulton-ware"), with its strong colourings and indestructible glaze, has been used very successfully for tile-facings as well as for constructional block work. Several colours new to salt-glazed stoneware are now available as well as new methods of decoration.

A stoneware with semi-glazed or egg-shell surface, presents many valuable recommendations. It bears, so far, the name of "Carrara" Enamelled Stoneware, from the similarity of its texture to that of marble. The exterior of the new Birkbeck Bank, now being erected in Southampton - buildings, Chancery - lane, from the designs of Mr. T. E. Knightley, is in this material. The absence of a high gloss, and the quiet harmony of colour combine to render the effect very striking and suggestive to those who are in search of new materials.

A third class of material for exterior work is found in stoneware with a vitreous-enamelled surface. This ware has a more glossy surface than the "Carrara" stoneware, but is not so glossy as the salt-glazed Doulton ware. The colours applied are more or less opaque, different in this respect from the colours glazed by salt, which always presents a somewhat varied transparent appearance, brought about by the conditions of the firing. At the high temperature to which all stonewares are exposed in the kiln, it is not possible to expect a very extensive palette of colours, but Messrs. Doulton and Co. have successfully enlarged this palette, and show some interesting suggestions in colour effects, suitable for all kinds of exterior and interior decoration.

With the rather more extensive colour resources of faience glazes and enamels, Messrs. Doulton and Co. are able to gather together some effective specimens of what they have already supplied for various buildings, and of further new arrangements in colour and design. The body used for the glazed terracotta is very hard, and is not open to the objections hitherto urged against a soft ware. All kinds of effects are available in faience-modelling in high or low relief, ornament in raised outlines, "underglaze" hand-painted designs of figures, flowers, landscapes, &c., painting in "impasto," painting in glazes or in dull-surfaced enamels, or in Indian and Persian styles. One of the most recent decorative works executed was in ivory-enamelled faience enriched with gold.

It is hardly necessary to do more than mention that in terracotta, Messrs. Doulton and Co. have recently been intrusted with some large works in which their brown-buff terracotta has been successfully introduced.

The showroom for glazed-ware mantelpieces and fireplaces has been rearranged, and now contains several new patterns worthy of attention. It is almost too late in the day to now point out the advantages and attractiveness of a glazed ware of good colour for use in what is generally the most conspicuous feature of a room. With these fireplaces is shown one of the open stoves, with back and front fires and air-flues, which are now being used in hospitals and asylums, the whole construction being in glazed-ware.

An altogether new showroom has been added to

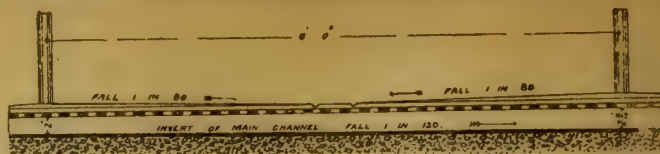


Fig. 105.

enable the firm to exhibit some of their more recent introductions in sanitary wares and fittings. Among these may be mentioned:—

*The Silent Arrangement for Cisterns.*—All siphons have hitherto made more or less noise in action at the end of the flush. In private houses especially, this has been considered a drawback, but by the arrangement of Messrs. Doulton and Co's present tank, silent action has been obtained without the power of the flush being in any way weakened.

*Simpliciter Valve Closet.*—This is a new form of closet, being a combination of the pedestal and valve principle, and combines all the advantages of both closets. The basin and trap being entirely of ware, a large body of water is retained in the basin, and owing to the depth of water in the trap, even should the valve be left open, the pan itself can never be dry, the flushing being done by a simple waste preventer.

*1896 Patent Bath.*—This is an arrangement for quick waste to bath, and instead of the old-fashioned standing waste being incased and almost impossible to get at for cleansing, it is in this case exposed, being fitted in a recess at the end of bath. It is glass-enamelled inside, in order to, as far as possible, prevent fouling, and can be easily removed and cleansed.

*Vitreous and White Porcelain Enamels as applied to iron baths.*—By means of these all the advantages of an earthenware bath may be obtained at a considerably lower cost. The vitreous enamel can be supplied at the same price as the ordinary first-class metallic enamel, and can be had in either French grey or light green colours.

*Glass-Enamelled Iron Pipes.*—The adoption of this improvement gives a very smooth surface to the interior of the pipe.

*Waverley Basin.*—This is a large recessed lavatory basin with removable standing waste and quick discharge.

*No. 515 Sink.*—This sink is very suitable for hospital and private use; it is handsome in appearance, and all parts are exposed, so that no obnoxious matter can remain unseen, as is often the case when an inclosure is used. A grating and chamber cleanser can be used in connection with this sink. The basin is thoroughly flushed by a siphon cistern.

### STABLE CONSTRUCTION AND SANITATION.—XI.\*

FROM time to time many varieties of trapped gully have been specially designed to receive stable sewage; most of them consist of a modification of the ordinary siphon trap, with the addition of a catch-basket or grating to receive and

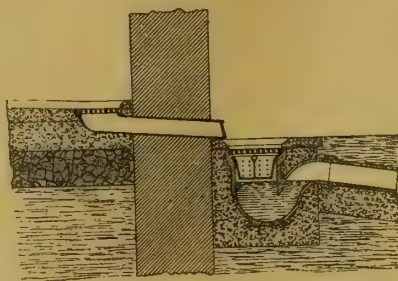


Fig. 106.

retain the particles of straw, &c., which would otherwise be carried by the liquid sewage from the stable into the general drainage system. Where such means are not adopted to prevent the short lengths of hay and straw entering the drains much inconvenience frequently results, as the fibrous matters readily cling to the sides of the pipes (especially if the surface is in the slightest degree rough or uneven), and so form the nucleus of continual stoppages.

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Fig. 106 shows a simple form of trapped gully, with a catch-basket under the surface grating; inside the stable the end of the main channel is arranged with an iron shoe, fitted at one end with a hinged grating and a sensitive flap-valve at the other, the whole discharging over the trapped gully outside. The coarser solids are retained by

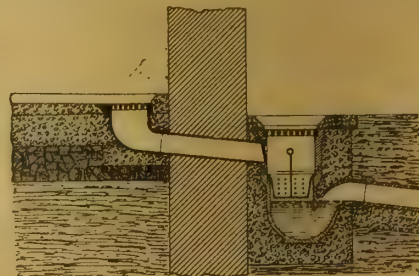


Fig. 107.

the internal grating, whilst the flap-valve prevents the entrance of air-currents through the shoe. Any pieces of straw passing the gully grating are retained by the catch-basket immediately below. The solid matters should be frequently removed from the catch-basket, and the gully thoroughly cleansed by hand.

A slight modification of the preceding arrangement is shown in Fig. 107. The yard trap is provided with an extension piece or gully-top, in

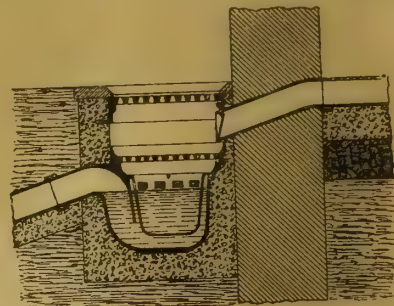


Fig. 108.

order that the shoe may discharge below the surface grating, and so avoid the unsightliness of stable refuse collecting on the grid at the floor level.

The form of trapped gully shown in Fig. 87 may also be arranged with satisfactory results in a somewhat similar manner to that just described;

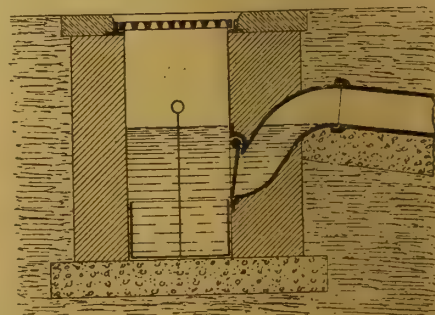
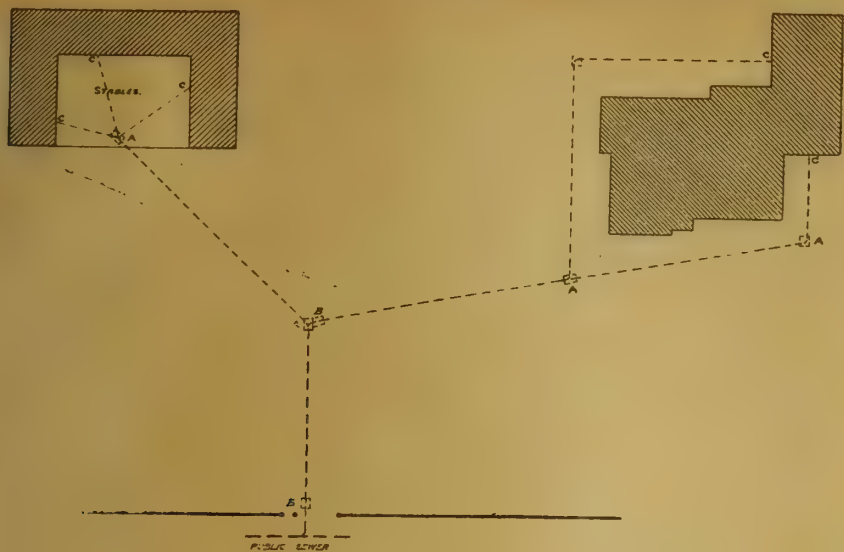


Fig. 109.

another well-known trapped gully is illustrated in Fig. 108. The main channel from the stable, being provided with a covered grating throughout its length, is carried direct through the wall and discharges over the gully, as shown. The outer end of the channel-pipe is fitted with a flap-valve to prevent back-draught.





- Reference Table -

- A = Inspection chamber  
B = Intercepting chamber with fresh air inlet  
C = Ventilating shaft to fresh air outlet

Fig. 110.

When it is required to remove quantities of liquid refuse gathered from a comparatively large area, as in stable-yards, &c., a surface gully similar to that shown in Fig. 109 is frequently used; the bottom is formed with concrete and the sides of brickwork in cement, finished on the face with cement-rendering  $\frac{3}{4}$  in. thick. A cast-iron siphon is securely built into the side of the pit in order to form a trapped connection to the drain;

provided at that point. When an independent outfall cannot be so arranged a disconnecting chamber should be placed at the junction of the stable and house drains, as indicated in Fig. 110; this is essential, inasmuch that stable sewage, unlike ordinary house sewage, consists in a great measure of urine in an almost undiluted form. Large quantities of ammoniacal and other gases are, therefore, liable to be given off during its

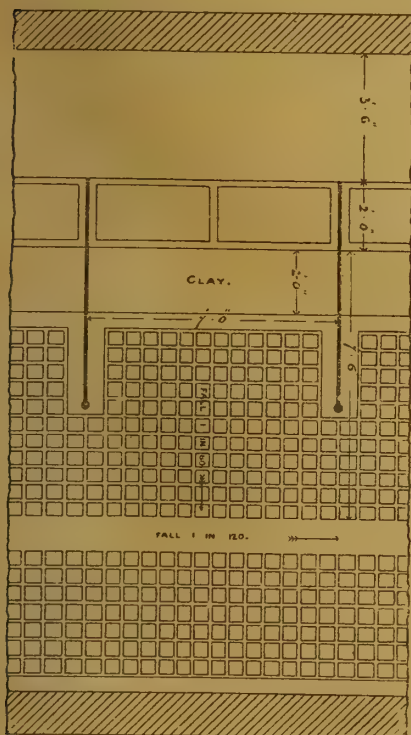


Fig. 111.

this outlet from the gully is provided with a hinged grating, so that the pieces of straw, &c., are retained within the pit. The yard gully shown in the sketch is fitted with an iron silt bucket, but for large gullies of this type the silt bucket is omitted, and the sides of the pit gathered over so as to reduce the opening at the top to the same dimensions as the surface grating.

Stable drainage should be kept entirely distinct from the ordinary house drainage system; wherever practicable, it should be carried direct to the public sewer with a separate outfall, the usual disconnecting chamber being, of course,

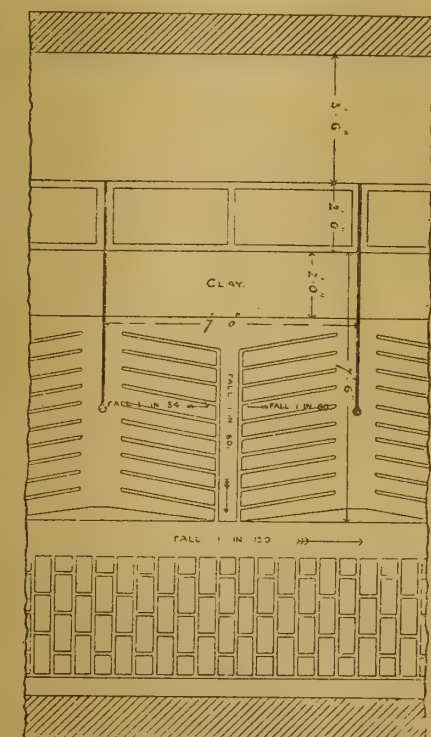


Fig. 112.

passage through the drains, and if the stable sewage is not completely cut-off from the house drainage these penetrating and unpleasant odours are liable to pass through the water-traps of the gullies near the house.

The whole of the drains must be laid in perfectly straight lines, with an even gradient from point to point. Inspection chambers should be provided at every change of direction, and also at a distance of 100ft. apart on any long line of drain, so that every portion of the system may be accessible by means of drain rods. The diameter of the pipes should be as small as possible con-

sistent with the volume of sewage that must be removed; they should be laid with good self-cleansing falls, so that a velocity of not less than 3ft. per second is obtained when the depth of the stream of sewage is one-fourth the diameter of the drain through which it is passing. It is a good practice to provide an automatic flushing cistern at the head of the stable drain or drains, so that they may be periodically flushed and cleansed, say, once a day. The drainage system should be well-ventilated throughout; a fresh-air inlet being provided at the intercepting chamber, and foul-air extraction shafts at the head of each drain.

In country districts, where no system of public sewers is available, the stable drainage should be carried to a cesspool placed in the stable yard, or at some convenient point in the vicinity. The pit should be 10ft. to 12ft. deep and 6ft. to 8ft. in diameter, the bottom being formed with Portland cement-concrete not less than 12in. thick; the sides should be steined with hard well-burnt bricks built in cement and not less than 9in. thick. The brick steining may also be backed

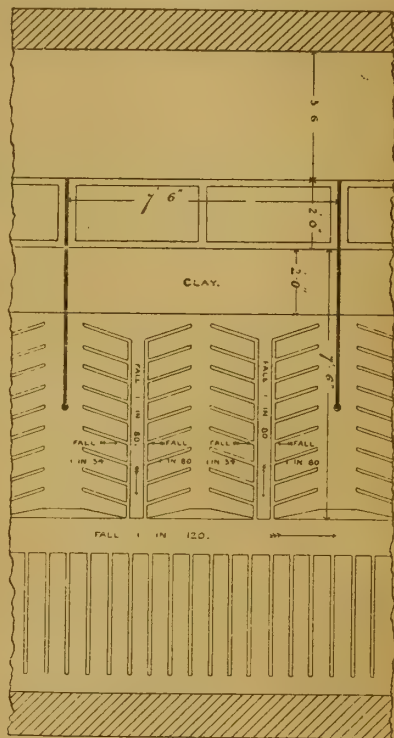


Fig. 113.

with 6in. or 9in. of well-tempered clay-puddle. The top of the cesspool should be arched over with brickwork 9in. thick in cement. A strong iron manhole cover and frame should be provided for convenience of access at any time. The whole of the interior must be thoroughly well rendered with cement about  $\frac{3}{4}$  in. thick, so that it may be perfectly watertight; it should also be well ventilated by means of a ventilating manhole cover, or when such an arrangement would be likely to prove objectionable, owing to its proximity to any inhabited buildings, a low-level mica flap fresh-air inlet should be provided, together with a foul-air extracting shaft about 9in. in diameter. The contents of the cesspool will require to be emptied at stated intervals.

The general principles involved in the drainage of cowhouses are precisely similar to those already discussed for the proper drainage of stables; but the arrangement of the surface drainage from the stalls is slightly modified to suit the necessities of the case. Fig. 111 is the plan of a stall or "standing" for two cows, showing the mode of grooving and channelling which is sometimes adopted for floors of brick or concrete. The numerous transverse grooves are objectionable, as they render it difficult to properly cleanse the surface.

A concrete floor, having two central stall grooves, each connecting a series of transverse grooves, is shown in Fig. 112; the floor has a fall of 1 in 80 from front to rear, the sides having gradients of 1 in 34 and 1 in 80 respectively, whilst a fall of 1 in 120 is given to the main channel. In Fig. 113 the general plan of



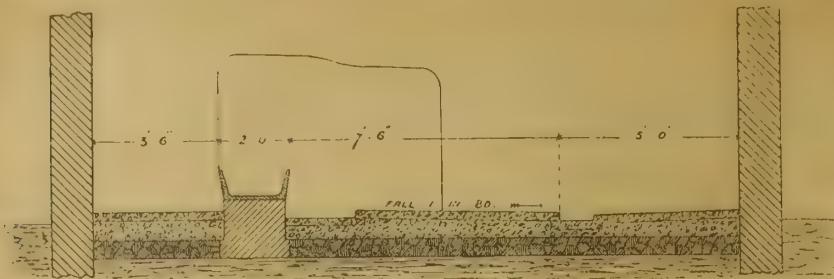


FIG. 114.

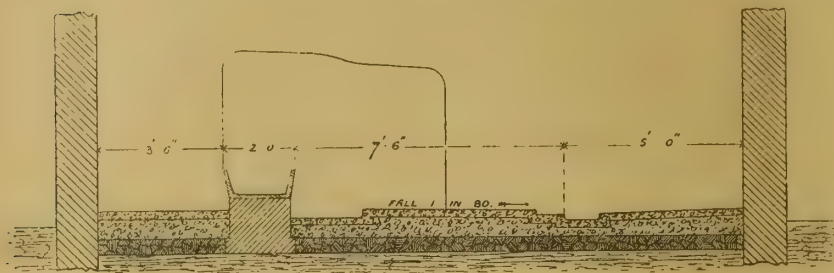


FIG. 115.

the stall grooves is similar to those last mentioned, except that, instead of one, there are two complete sets of longitudinal and transverse grooves provided to each stall; the latter arrangement is the best, as it affords a more comfortable standing place for each animal, instead of compelling them to stand sideways towards one slope of the floor.

Fig. 114 is a transverse section through a cowbyre showing the general arrangement. The stall floor is raised from 2in. to 3in. above the level of the gangway or passage; a wide, shallow sinking, about 4in. deep and 2ft. wide, is formed in the floor directly in front of the feeding troughs (see Figs. 111, 112, and 113); this shallow trough is afterwards filled up to the floor level of the stall with prepared clay, so as to provide a comparatively soft surface for the fore-legs and

placed well away from any inhabited buildings, and at least 40ft. away from the stables. The floor of the pit may be formed with concrete, the surface being rendered with cement and laid to proper falls, so that any liquid sewage drains into a gully trap placed immediately outside as shown in Fig. 1; the opening through the wall is protected with a close grating, so as to prevent loose straws, &c., passing into the gully. The walls are generally built of brickwork, 9in. thick, 2ft. 9in. high, well rendered with cement on the inside, and finished on the top with a brick or stone coping.

\* \* Figs. 87, 92, and 96 in last week's article are respectively illustrations of stable paving, &c., made by Messrs. B. Ward and Co., of 15, Great George-street, S.W. Further particulars will be found in their illustrated catalogue, which is well worth getting by all interested.

#### THE SALON OF THE CHAMPS ELYSEES.

THE annual Salon of the Société des Artistes Français at the Champs Elysées opened its doors on Monday last to the select public which makes a point of assisting on varnishing day. The *ensemble* of this year's work is better than that of several preceding years. There are, however, no pictures which by their originality or eccentricity attract special attention.

M. Henri Martin has two pictures in Room I.—one a study of a head, entitled "Silence," the other a very large canvas called "Vers l'Abîme," or towards the abyss. This picture shows human destiny symbolised by a woman form with vampire wings, her walk airy and gay, her face smiling and full of irony, followed by a motley crowd of human beings, nude or lightly covered with garlands of flowers, some pushing forward and struggling with each other in their eagerness, like a disordered herd; others, old men, with white hair, already meeting their inevitable destiny and preparing themselves for the final agony of death, writhing in the foreground of the horrible landscape covered with squirming larvæ and croaking ravens—a strange picture, and a novel but unpleasant subject skilfully composed and coloured with the cleverly-harmonious tones which make the pictures of this young artist so noted.

An immense picture in the same room, executed for the State, is by M. Jean Paul Laurens, and entitled "Lauraguais." It shows us a wide landscape in the south of France—an undulating plain with wide bands of ripe harvest brilliant in the sun, and other dark bands of, as yet, uncultivated land, whose regular furrows produce the effect of diaper work under the blue sky, relieved here and there by the figures of stout oxen drawing the ploughs, guided by sturdy labourers in quaint costume. This simple but magnificent work is executed with all the well-known conscientiousness of this artist. The immense landscape, at once so fertile and so bare, is full of stern sentiment and force, the effect of calm and resignation. The persevering struggle

of man, aided by his plough and strong oxen, against the earth is energetically portrayed, and if it was not that the somewhat heavy and hard horizon of blue sky and hills allow criticism, it would be bold to do anything but praise this picture as a *chef-d'œuvre*.

The "Madness of Titania," taken by M. Gervais from "A Midsummer Night's Dream," is attractive, but not equal to this artist's usual work. The nude figures of Titania and Bottom, surrounded by a group of women figures representing the forest nymphs, make a pretty *ensemble*; but M. Gervais might have kept his composition more to the spirit of the fantastic poetry of Shakespeare, and, instead of the set park-looking background and group of women, who savour rather too much of the model, have shown us more rustic scenery, and portrayed the mysterious inhabitants of the forest, the sylphs and malicious sprites of Shakespeare's fancy. The nude figure of Titania is pretty, but so cold that Bottom's preference for a bunch of hay to all the beauties of his fair caprice may easily be understood.

M. Fantin Latour exhibits two rather small paintings, called "Temptation" and "The Night." "The Temptation of St. Anthony" has given the artist a pretext for depicting a charming bouquet of women forms grouped in a circle around the saint attired in his coarse gown; a wonderful display of luminous flesh-tones of pink, blue, gold, and red, a clever harmony of colour and form, and skilful modelling of the palpitating forms of fair women, whose charms even St. Anthony must find not easy to resist. The other picture, "Night," night at the moment when it flees before the approach of day, is symbolised by a delicious and opulent form of a woman draped in airy tones of blue; the small god of love and dreams is seen escaping into the deliciously-coloured sky which announces the arrival of daylight. These two pictures, by an artist whose sincerity in art, and whose wonderful talent of expression, idealism, and harmony of colours have been one of the charms of the Salon for twenty years, are well worthy of admiration.

M. Gérôme has two pictures displaying his usual talent—"The Flight into Egypt," and "The Entrance of Jesus into Jerusalem." These works, however, despite the evident qualities of the artist, are not very pleasing;—there is too much classic coldness in the work; the figures are hard and too set, the architecture and ornaments are doubtful. Despite all criticism, however, these two paintings contain much excellent talent, and the colouring, although somewhat cold and grey, is harmonious. The style of painting is evidently a little forced this year, purposely to bring more clearly into evidence the opinions held by this well-known artist and expressed by him publicly a short time ago.

Cold also are the figures of the two pictures by M. Bouguereau, "Compassion," the crucified Christ looking with pity on the misery of a man crushed beneath the weight of a cross; and "Blessure d'Amour," the figure of a young girl wounded by one of Cupid's arrows.

"Aupres du Feu," by M. Tony Robert Fleury, is a delicious piece of work, representing a young girl half-clothed in satin undergarments reclining in the shadow of half-drawn curtains, which allow only a ray of light to pass, sufficient to show the graceful figure of the young girl in indolent, almost voluptuous, repose, and enough to light up the face, bust, and dress with dainty tones of warm grey—a picture painted with clever fulness and a careful brush.

M. Henri Cain has taken for his subject "The Triumph of Gold over its Victims," a somewhat noisy picture, but one full of qualities of composition and colour, representing a motley crowd of men and women drawing a chariot, in which is reclining with insolent ease a stout gentleman, clothed in black dress-suit, and with his silk hat over one ear, smoking a cigarette with a self-satisfied air.

M. Henner is represented this year by two portraits only, one of a blonde dressed in black velvet, the other a portrait, a brunette draped in red, both painted in the well-known style and with the skilful talent of this artist.

M. Tanner, a modernist, has a painting which is very nearly a *chef-d'œuvre*, the "Resurrection of Lazarus." The attitude of Jesus in communion with God, the body of Lazarus into which life is slowly penetrating, and the faces of the crowd witnessing the miracle, are all most cleverly studied, and painted with sober taste and excellent harmony.

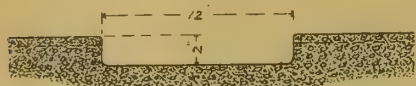


FIG. 116.

feet of the cattle. In many cases the sinking is omitted, and the concrete or brick paving of the stall continued up to the feeding troughs; but, unless the floor is well littered with straw bedding, the animals' knees are liable to be bruised and injured when lying down.

An alternative section through a cowhouse is given in Fig. 115. It will be noticed that a "step" about 9in. wide and 3in. high is formed between the main channel and the rear of the stalls; this step is intended to receive the excrement or droppings from the cows, so that the floor

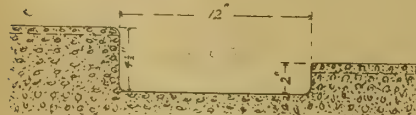


FIG. 117.

of the stall itself is kept quite clean, whilst the main channel is not blocked by the solids.

The main channel at the rear of the stalls should simply be an open shallow gutter, made sufficiently wide to allow the attendant to clear away with a spade any solid matters that may accumulate within it; a channel 12in. wide and 2in. deep will be found sufficient for this purpose. Figs. 116 and 117 show the sections usually adopted; they should in all cases be arranged to discharge directly outside the building over a trapped gully in a somewhat similar manner to that already described for stables.

A manure pit must be provided in some convenient position for the reception of stable refuse, having a capacity sufficiently large to contain the accumulations for five or six days; it should be



The picture of a "Rescue at Sea," by M. Tattergrain, is a very remarkable work, full of poignant emotion. A vessel sinking in mid-seas, and the rescue made by a fishing-boat—a well-rendered scene, full of excellent colouring, displaying the dramatic splendour of the infinite, and the terrible struggle with the ever-tracherous sea, which obscure heroes are always prepared to make, and risk their lives in saving those of their fellow creatures. This remarkable picture, by an artist alike devoted to sea and sailors, is a touching display of gratitude to the old sailors of the Home of Berc-sur-Mer.

M. Roybet, with his usual mastership, has produced a *chef-d'œuvre* in his portrait of Philippe Cluvier, the geographer of the 16th century. The face is admirably painted, and full of expression. We can see in the eyes of the geographer the wonderful activity and power of brain and intelligence, and our admiration of the face will hardly allow us to leave in order to further wonder at the clever execution of the cloth, velvet, and black silk of the costume.

M. Benjamin Constant has a portrait of M. Chauchard and one of the Duc d'Aumale. The once exiled prince is seated on a stone bench in the park of Chantilly, a spot so full of the glorious reminiscences of his race. The background of gold and yellow of autumn foliage may be criticised as being somewhat wanting in execution and effect, and the face of the Duc appears older and weaker than it ought to be, and the head is placed in an unfavourable pose; the artist might have given a prouder expression to the face if he had taken his inspiration on the day when the Duc d'Aumale, on his return to France, took his seat amidst the members of the Académie. The portrait of M. Chauchard is, on the contrary, excellent as regards character and expression.

The small picture by M. Detaile, "The Funeral of Pasteur," is somewhat influenced by the souvenirs of the Russian Fêtes, for several Russian uniforms are visible amongst the many official followers of the body of the renowned Pasteur. The Archduke Constantin and M. Felix Faure are the principal personages, and the picture will later on have a documentary value. The colours are, however, rather harsh and crude, and the portraits have too much of the photograph in them—in fact, the skilful touch usually exhibited by this artist is wanting this time.

The "Far Niente" of M. Bunny, a young Australian who is fast coming to the front, a fervent admirer of M. Pavis de Chavannes, and whose pictures show each year rapid progress, is a charming piece of work, composed of three or four figures of women languidly contemplating the sea. The colouring is of a subdued richness, and the grouping of the figures is very charmingly arranged.

M. Levy Dhurmer, with his "Eve in Paradise," shows us how all the talent of the artist may be concentrated in the study of one figure only. Eve, during the moment of temptation, is shown standing ankle-deep in the grass, near to a tree around which the tempter, in the form of a serpent, may be seen winding his body. Eve is listening attentively to his words, her arms crossed over her breast. Behind her, on the opposite side of a lake, a forest background is lighted up with the fire of the setting sun, and against this brilliant background the fair body of the woman appears to become immaterialised and wonderfully beautiful in its transparency of flesh tones and effects of colouring.

#### THE A.A. JUBILEE.

IN commemoration of the Jubilee of the Architectural Association, a special issue of the A.A. Notes has been published, containing a series of articles, written by past presidents, on the rise and progress of this vigorous body, and showing how, commencing with a few members, it has grown to its present position of influence and usefulness. The prefatory address is written by Mr. Cole A. Adams, president in 1883-4, and then follows a paper on the origin of the Association, by Mr. Thomas M. Rickman, president in 1854-5, who shows that it is the lineal successor of the Society of Architectural Draughtsmen, which existed from 1842 to 1847, when that body numbered not more than two dozen members. Professor Robert Kerr, the first president of the Association, contributes a short article on "The Aim of the Association," in which he points out that throughout the whole period of fifty years in which it has been working, the Association has steadily pursued one object, and is pursuing it still—to

promote the education of the young architect as an architectural student. He shows that, half a century ago, good service was being rendered to this cause by Cockerell at the Royal Academy, Donaldson at University College, and Hosking at King's. Mr. R. Phené Spiers, President 1867-1868, who has been a member of the Association since May, 1856, gives some "Reminiscences," in which he shows that, when he joined, the A.A. was in a bad way; the attendance at meetings averaged six members, and in the Class of Design there were only two students. Mr. J. Douglass Mathews, President 1872-3, traces the gradual development of the Association during the past quarter of a century, in which period the members increased from about 160 to over 1,100. Mr. Arthur Cates, who acted as hon. secretary 1852-5, shows the connection between the educational schemes of the Association and the examination movement; Mr. H. D. Searles-Wood, President 1888-9, writes on the social side of the Association; Mr. S. Flint Clarkson, President 1879-80, on the Annual Excursion; Mr. Thomas Blashill, President 1862-3, on "The Styles"; and Mr. Aston Webb, President 1881-2, in a paper on "Our Future," deprecates acceptance of any tempting subsidy from a Government department, local authority, or technical education "scheme," pointing out that so long as the members keep the management in their own hands, success is assured; the only respect in which help should be accepted is in the provision of more suitable and adequate premises, so urgently required. Mr. Leonard Stokes, President 1889-90-91, writing on the same topic, thinks that the great danger ahead is the attempted capture of the Association by the older men with their Royal machinery—a capture which would, he believes, be fatal to the welfare of the institution; he suggests that a special committee (no member on which shall be over 30 years of age) should be appointed to inquire into and report on the influence of the R.I.B.A. examinations on the architectural training of students in the present day. The closing papers are by the Professors of Architecture at University and King's Colleges, Mr. T. Roger Smith, President 1860-61, and 1863-64, and Mr. Banister Fletcher, on the work done in those institutions, and its bearing on architectural education.

The Jubilee programme is as follows:—

WEDNESDAY, MAY 5TH.—The Banquet (Annual Dinner), Trocadero Restaurant, Piccadilly-circus. 7 p.m.

THURSDAY, MAY 6TH.—Conference at the Royal Institute of British Architects, 9, Conduit-street, W., on the Policy of the Association, and the means of providing suitable accommodation. 3 p.m.

Members' Soirée, St. George's Hall, Langham-place, W. 8 p.m. The Musical Play written by Mr. E. Howley Sim, with music written by Mr. Leonard Butler, will be presented under the management of Mr. G. B. Carvill. Admission by ticket only, to be obtained of the Hon. Secs., 56, Great Marlborough-street, W.

#### HAYWARD'S PATENT "SEMI-PRISM" LIGHTS.

WE have received a new illustrated catalogue of the well-known pavement lights manufactured by Messrs. Hayward Brothers and Eckstein, Ltd., of Union-street, Borough. The book gives illustrations, sizes, and prices of various kinds of semi-prism lights. So many of our readers always specify them, that it is needless to dilate on the special advantages of this valuable pavement light. The semi-prism lenses are made in many ornamental forms, which are illustrated in the first pages of the catalogue. Several useful sections of the lens lights for floors are distinguished, some of these being used where the daylight is required to be thrown into the back of basement, with good overhead and distributed light; others where top light and diffused light are required. Architects would do well to specify the kind of lighting and the particular pattern required. These patterns range from simple 3×3 lenses of strong kind for ordinary pavement use to patterns like the "Edinburgh," with hexagonal lenses. The illustrated pages of this catalogue describe the sizes and section of lens made and kept, though other sizes can be made to order. The tile and lens lights combine the lens with the effect of tile pavement, some of these in quiet and pleasing colours. In this connection we must draw attention to Hayward's patent

combination "non-slipping" pavement and floor lights, which are made to meet the wants of pavement and light combined. These have a very ornamental appearance. The spaces between the lenses, instead of being filled with concrete, are filled with blocks of soft metal, brass, or aluminium, so forming a surface of cement and metal flush with the glass, giving a good foothold. In other cases, encaustic tiles are combined with the metal blocks. These "combination non-slipping" pavements will, we are sure, be much appreciated by architects for lobbies and paved surfaces before windows. We hear that Messrs. Hayward Brothers and Eckstein, Ltd., have just obtained the contract for supplying Hayward's patent semi-prism and other lights for the New Markets in Sydney, N.S.W., and also the iron staircases for the same building. The plates show some excellent floor and roof-lights, Hayward's stallboard-lights for shop fronts, rolling and tip-up lights for warehouses, patent cellar-flaps in guttered frames, with gear for opening, self-locking coal-plates, and other inventions which combine light and ventilation.

#### CHIPS.

The vicar of St. Leonard's, Shoreditch, is making an appeal for £2,000 for the restoration of his church. The fine stone spire is, he says, in so dilapidated a condition that works of repair have already been begun upon it. The fabric caused the first recorded strike in the building trade, one which led to so serious a riot that Horace Walpole drew attention to it in Parliament.

The sudden death is announced of Mr. William Hawe, principal in the firm of Messrs. Hawe and Foley, architects, of Beverley.

The Wentworth Castle Hotel, Aldeburgh, East Suffolk, has just been opened. It has been built from designs by Mr. T. E. Key, of Bloomsbury-square, W.C., and is Jacobean in style. It has a frontage of 300ft. to the sea, and is faced with white bricks, Bath stone being used for dressings. Mr. George Knowles, of Aldeburgh, was the contractor.

Steps are being taken by the Paddington Vestry to obtain power to utilise the site of the existing vestry hall in Harrow-road and a large plot of adjacent land for the purposes of a projected new Town-hall. The present vestry hall has long been inadequate to public requirements, and it is now proposed to build a more spacious Town-hall.

The town council of Bury, Lancs, decided at a special meeting held last week to take immediate steps for the erection of a free library and art gallery. It was decided to purchase as the site land at the corner of Silver-street and Moss-lane, and to invite plans and estimates for the buildings by public competition.

Mr. E. J. Batten, the late surveyor to the Shirley Local Board, has secured the appointment of Surveyor and Inspector of Nuisances to the Bridport (Dorset) Rural Council, the joint salary being £120 a year.

Lady Augusta Mostyn has decided to build a church at Deganwy, a suburb of Llandudno, in memory of her father and mother, and in commemoration of the Queen's long reign. Her ladyship will also give £2,000 towards the chance of the Duke of Clarence Memorial Church.

The subscribers to the Royal Caledonian Asylum will meet on Monday next at Scots Hall, Crane-court, to consider the proposal of the directors to move the asylum to a northern suburb of London. Towards this object £12,000 has been given by an anonymous donor.

On Thursday night in last week the engine-house and machinery shed at the brickworks of the Scottish Terracotta and Metallic Brick Company, Limited, situated at Braidwood, near Carlisle, were destroyed by fire. The damage done exceeded £3,000.

For some years past the Crown and the Verderers of the New Forest have been at variance on the subject of the cutting of timber in the forest, the Verderers especially objecting to the Crown licensing persons to sink sawpits and erect machinery for cutting up the timber. When the matter came again before two judges in the Queen's Bench Division last week, the Attorney-General intimated that an agreement had been come to by which the Verderers were to have notice when any piece of waste was required for the purpose of cutting up timber, and in case of their objecting the matter was to be referred to arbitration. The Court sanctioned the arrangement.

The works committee of the Edinburgh and District Water Trustees have had before them eight offers by contractors for the construction of the large reservoir at the Talla. The three lowest offers were selected and remitted to the engineer (Mr. Wilson, C.E.) for examination and report.



## OBITUARY.

THE somewhat sudden death of Mr. CHARLES JAMES GLADMAN, A.R.I.B.A., of 10, Bush-lane, Cannon-street, is announced, from an affection of the heart, and we understand he was buried last Saturday afternoon. Mr. Gladman, who was only forty-five years of age, became an Associate of the Institute of British Architects in 1881. He designed and built St. Mary's Church, Stamford Brook, Hammersmith, and was engaged in work connected with surveying and engineering undertakings, it is said. Mr. Gladman, who died at his residence, Fernlea, Hendon, on the 12th inst., leaves a widow and two daughters.

MR. T. SAMPSON, city coroner for Liverpool, held an inquiry on Thursday in last week regarding the death of JOHN NUNN HILL, 55, an architect and surveyor, who practised his profession at 14, Castle-street, and lived at Elm-vale, in that city. Evidence was given to the effect that for the past seven or eight months the deceased had been mentally depressed owing to business troubles. Being of a sensitive disposition he exaggerated trouble. For some time past he had not been very steady in his habits. He never threatened to take his life, but used to say that he would never get over his troubles. On Tuesday morning in last week he left home to go to business, and in the afternoon he was found dead on the floor of his office. Mr. Frederic Wright, architect and surveyor, with whom the deceased was in partnership, stated that the business troubles of the deceased were really imaginary. He had become mentally depressed, and invented trouble. When he arrived at the office on Tuesday morning he was in a depressed state. Witness left the office in the afternoon, and on returning found his partner lying on the floor, dead. On a writing table near to him was a glass tumbler, which smelt of carbolic acid. Information of the occurrence was given to the police, and a doctor who was summoned pronounced life to be extinct. The coroner said that the deceased man seemed to have been depressed for some months past, and his act was evidently the outcome of a diseased mind. The jury returned a verdict to the effect that the deceased poisoned himself by drinking carbolic acid, and that he was insane at the time.

ALDERMAN SIR WILLIAM LAWRENCE, who died on Sunday last after a long illness, will be remembered as for many years senior partner in the extensive builders' and contractors' business carried on in conjunction with three of his brothers in Commercial-road, Lambeth. When the family retired about 12 or 15 years since they made a present of the undertaking to the heads of their staff—an instance of almost unexampled generosity—and the new firm is well known as Messrs. Hall, Beddall, and Co. Sir W. Lawrence was in his 79th year, having been born in 1818. His father, Mr. William Lawrence, was Sheriff of London and Middlesex in 1850, and was for seven years alderman of Bread-street Ward, though he did not live, as two of his sons afterwards did, to attain the Lord Mayor's chair. Sir William served as Lord Mayor in 1865, and sat in the Liberal interest for the City of London from 1865 till 1874, when he was defeated, and again from 1880 till 1885, when he retired. He was knighted in 1887. He was never married. Miss Lawrence, his sister, who was Lady Mayoress during his mayoralty survives him, as do two brothers—Sir James Clarke Lawrence, Bart., who now becomes the senior alderman, and Mr. Edwin Lawrence, M.P. for the Truro Division of Cornwall. Sir William succeeded his father in 1855 as alderman for Bread-street Ward, and 30 years later, as senior member of the bench, was transferred to the sinecure Ward of Bridge Without.

THE REV. WILLIAM FREDERIC CREENY, F.S.A., vicar of St. Michael-at-Thorn, Norwich, the well-known authority on monumental brasses, died on Easter Sunday at the age of 72. From 1853 till 1876 Mr. Creeny held various curacies, and in the later year he was presented to the living of St. Michael-at-Thorn, of which the net value is about £80. On the slenderest resources he achieved remarkable results in the field of Christian archaeology. In 1884 he published a book on monumental brasses on the Continent of Europe, a field of labour which had hitherto been almost untilled. The book contains 80 photolithographed reproductions and descriptive notes of the finest specimens, to obtain which Mr. Creeny traversed Europe from Seville to Posen, Lübeck, Breslau, and Sweden. In November, 1891, he published a series of illustrations of

incised slabs, with notes. Seventy-one specimens of this branch of Mediæval art, extending over four centuries, are given in the book.

MR. CHARLES ELIOT, landscape architect, of Boston, Mass., died a fortnight ago. Mr. Eliot, a son of President Eliot, of Harvard University, after a liberal general training, devoted himself to landscape design as a profession, in pursuance of an inclination which he had long cherished. He studied long both in the United States and abroad, and began practice with an admirable equipment of skill and knowledge. The adoption by the City of Boston of the scheme for a Metropolitan Park System, which was mainly due to Mr. F. L. Olmsted, gave an opportunity for utilising Mr. Eliot's exceptional qualifications, and, as the associate and friend of the Messrs. Olmsted, he had a most important part in this great work.

MR. DUNCAN M'LELLAN, one of the oldest officials connected with the Corporation of Glasgow, died on Monday at his residence, 7, Kelvingrove-terrace, Glasgow, in his 83rd year. For a long period he held the post of superintendent of the public parks, retiring from active work a few years ago on account of failing health. During his term of office there were considerable additions to the acreage of open spaces in the city. He was largely consulted by municipalities and private persons in regard to the laying-out of pleasure-grounds and parks, and after his retirement he prepared a volume dealing copiously with the history and formation of the parks of Glasgow.

## CHIPS.

The new cottage hospital, Newton Abbot, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. Alfred Woolnoth, a well-known Hampstead artist, and a member of the Hampstead Art Society, died on Saturday, at his residence, The Cottage, Upper-terrace, Hampstead Heath. He was only ill a few days.

The Government have decided to purchase the freehold of Hertford House, so that there will be no necessity to remove the Wallace Art Collection just bequeathed to the nation.

Sir E. J. Poynter, P.R.A., has been elected an honorary member of the Hampstead Art Society, which will hold its annual summer exhibition at the Vestry Hall, Haverstock Hill, from May 31 to June 12 inclusive.

Mr. J. Child, C.E., for many years past the engineer to the Lee Conservancy Board, died on the 14th inst. at his residence, Lee House, Enfield, aged 59 years.

While stepping on to the floating bridge at Southampton on the 14th inst., Mr. Gutteridge, the head of the firm of Gutteridge and Mitchell, architects, of that town, fell and broke one of his ankles.

Mr. Charles Joseph Batley, assistant waterworks engineer to the Corporation of Bury, Lancs, has been appointed resident engineer and manager in connection with the Oldham Waterworks, at a salary of £350 a year, to rise by annual increments of £25 to a maximum of £450, with house, coal, gas, and water free. The appointment is made in succession to Mr. William Watts, who has secured an appointment at Sheffield, for which Mr. J. Cartwright, the borough engineer of Bury, Lancs, was an intending applicant. Originally there were 87 applications for the post at Oldham.

The summer excursion of the London and Middlesex Archaeological Society will take place on Saturday, May 29, when a visit will be paid to Salisbury, Old Sarum, and Stonehenge. Mr. T. W. Shore, the late hon. secretary of the Hampshire Field Club, has promised to conduct the excursion.

Mr. Godfrey W. Ferguson, M.S.A., has been taken into partnership by Messrs. Jackson and Tillie to assist in the carrying out of their design for the new lunatic asylum at Pendysburn, which was placed first by the assessor in the recent competition.

Queensferry Bridge, spanning the Cheshire Dee, is now open for traffic. Vehicles were allowed to pass over on Thursday in last week. The Flintshire County Council Committee have just decided that until the formal opening by Mr. Gladstone owners of animals and vehicles, as well as cyclists, can use the bridge without payment of tolls.

The design of Professor Eberlein, of Berlin, for the monument of the late Duke Ernest of Saxe-Coburg-Gotha has been accepted by the committee, of which the reigning Duke is the president. The first stone will be laid in May.

## COMPETITIONS.

BELFAST.—The corporation of Belfast, acting under the advice of the professional referees, Messrs. Alfred Waterhouse, R.A., and Jos. C. Bretland, the city surveyor, have determined the final competition for the City Hall, which is to occupy the site of the old Linen Hall facing Donegal-place. The authors of the accepted design are Messrs. E. Thomas and Son, of Westminster, and the cost of the undertaking is estimated at £150,000. The second premiated design proved to be that submitted by Messrs. Malcolm Stark and Rountree, the third prize falling to Mr. James Miller, both firms being in practice in West George-street, Glasgow. Messrs. Thomas and Son have received instructions to proceed with the contract plans.

GOVAN.—Mr. George Washington Browne, of Edinburgh, the architectural assessor in the competition for the new Burgh Hall and municipal buildings at Govan, has made his award from the twenty-two sets of plans which have been on view in the Robert-street Hall. The authors of the selected design are Messrs. J. Thomson and R. D. Sandilands, of West George-street, Glasgow, of whose scheme the referees expressed a very high opinion, saying that the internal arrangements are very complete, and remarkably well arranged. The second premium (£50) has been awarded to Messrs. Thos. Dykes and Robertson, West Regent-street, Glasgow, and the third prize (£25) is won by Mr. W. H. Howie, also of Glasgow. Messrs. John Dansken and Purdie, two commissioners, also reported on the plans, of which there were twenty-two sets, two designs being by London architects. The Govan Board has confirmed the awards, and the work is to be proceeded with forthwith. It is a satisfaction to know that the undertaking is in such competent hands.

A new church is to be built at Colton, a hamlet in the parish of Bolton Percy, to commemorate the Diamond Jubilee. Plans have been prepared by Mr. C. Hodgson, F.S.A., of Durham, for a building capable of accommodating 80 worshippers, at an estimated cost of £800, and as most of the money has been subscribed, the work is to be put in hand immediately.

A syndicate have acquired the freehold property known as the Public Hall, Tottenham, N., and will erect a building to be called the Albert Theatre, Tottenham. The architect is Mr. Robert Emeric Tyler, F.R.I.B.A., and his plans have been duly passed by both the Middlesex County Council and the Tottenham Urban District Council. The building will seat about 1,500 persons, and will consist of boxes, circle, stalls, pit, and gallery.

A technical school is proposed to be erected at Consett, Co. Durham, in commemoration of her Majesty's Diamond Jubilee, from designs by Mr. C. E. Oliver, F.S.I., architect. The building is estimated to cost £4,000, towards which the Consett Iron Co., Limited, have promised £1,000 and the gift of a very suitable site facing the New Park.

Dean Stephens of Winchester is appealing for £600, as the balance of £1,000 required for the reconstruction of the organ in his cathedral, now being carried out by Mr. Henry Willis, by whose firm the instrument was built for the Great Exhibition of 1851. As to the general restoration, Dr. Stephens says the nave roof is now finished, but £6,000 more is required for the repair of the other roofs, more especially of the choir and north transept.

The report of the Labour Department states that there was a marked improvement in the general state of employment during March, and at the end of the month the percentage of unemployed in trade unions making returns was less than at any time since the autumn of 1890. As is usual at this period of the year a large number of strikes were recorded during the month, mostly, however, of little importance. A large number of persons had their wages raised during the month, in almost all cases without a strike. In the 114 trade unions making returns, with an aggregate membership of 453,963, 11,169 (or 2·5 per cent.) are reported as unemployed at the end of March, compared with 3 per cent. in February, and with 3·5 per cent. in the 108 unions, with a membership of 415,731, from which returns were received for March, 1896. Employment in the building trades has still further improved, and is now brisk. The percentage of unemployed in unions making returns for March was 1·2, compared with 2 for February, and 2·6 per cent. at the end of March, 1896. The furnishing trades are busily employed, the percentage of unemployed union members at the end of March being only 0·7, compared with 3 per cent. in February, and 1 per cent. at the end of March last year.



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## ILLUSTRATIONS.

THE NEW BEDFORD COUNTY HOSPITAL.—NATIONAL BRONZE MEDAL DESIGN FOR A STAIRCASE IN OAK.—DESIGNS FOR A COUNTRY HOUSE.—HOUSE AT BREASTON, DERBY.—EVERETT'S STORES BAKERY AT WALTHAMSTOW.—OXFORD BUILDINGS, COLWYN BAY.—NEW LAW UNION AND CROWN INSURANCE BUILDINGS, BRISTOL.—"LATCHMORE," EPPING.
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## Our Illustrations.

## THE NEW BEDFORD COUNTY HOSPITAL.

The design we illustrate to-day is by Mr. H. Percy Adams, of 28, Woburn-place, Russell-square, and was chosen in a limited competition by the appointed professional referee (Prof. T. Roger Smith), the award being unanimously confirmed by the building committee. The other architects who submitted designs were: Messrs. Houston and Houston, of London (placed second); Mr. W. Henman, of Birmingham; Mr. Ingham, Liverpool and Southport; Mr. Maidman, of London; Mr. Keith D. Young, of London; and Messrs. Worthington, of Manchester, these firms being selected from 69 architects who submitted their names as desirous of competing. The buildings illustrated, and now in course of erection, stand some 225ft. back from the Kempston-road, in the grounds of the present infirmary, which is to be disused when the new hospital is completed. The front administration building has a large boardroom on the first floor and sitting and bed rooms for the matron and house-surgeon, the second floor being occupied with servants' bedrooms. The entrance-hall is 25ft. high and top-lighted. The kitchen buildings are all only one floor high, the corridor through them on one side being for their exclusive use, the lobby indicated on the plan being the tradesmen's entrance. The other corridor is intended for the use of the staff, patients and visitors, and the lobby is the casualty entrance. The male and female wards are each 69ft. long and 27ft. wide and 13ft. high and designed for 16 beds each. The surgical cases on the ground floor, and the medical on the first floor. The children's ward is 69ft. long, 13ft. high, but only 24ft. wide. The wards have dados of glazed brick, 5ft. high, and Parian cement above, except the children's, which is to be lined with tiles, painted with pictures from nursery rhymes. The floors are all to be of terrazzo paving. The chapel is placed at the end of the avenue of trees which leads to the present infirmary, and has a gallery over the corridor. An isolation building (not shown on the plan) is provided at a considerable distance from the other buildings, and contains four isolation rooms, 14ft. 6in. by 14ft., with a nurse's room, &c., to each two rooms. The present laundry and mortuary are to be retained, and also the present entrance lodge is the Kempston-road at the beginning of the avenue. At first rooms will be found for the nurses in the present hospital buildings, but the scheme provides for building a nurses' home in the position shown on the plan at an early date. The whole of the buildings are to be faced with red Ibstock bricks and terracotta, and the roofs covered with

Broseley tiles. The accepted estimate for the buildings shown on the plan was £31,727, and Messrs. Kerridge and Shaw, of Cambridge, are the contractors.

## NATIONAL BRONZE MEDAL DESIGN FOR A STAIRCASE.

This staircase has been designed for a country mansion rather than a town house. As will be seen, the gallery or landing runs round the hall. Opposite the window would be the fireplace, with a minstrel's gallery over. The floor of the hall to be polished oak boarding, the staircase constructed entirely of English oak, and the ceiling an oak-and-plaster panelled ceiling. Mr. Maxwell Ayrton obtained a National Bronze Medal for this design.

## BUILDING NEWS DESIGNING CLUB: A COUNTRY HOUSE FOR A GENTLEMAN.

(For description and awards, see page 586.)

## HOUSE AT BREASTON, DERBY.

This house has recently been built for Mr. T. C. J. Harrison, and is a remodelling of an old house formerly on the site. The interior is richly fitted up with oak and cedar wainscoting and ceilings. The exterior is of Ruabon bricks and stucco with tile hanging. The work has been executed by Mr. J. Barlow, builder, under the supervision of the architects, Messrs. Marshall and Turner, of Nottingham, at a cost of about £2,500.

## EVERETT'S NEW BAKERY AT WALTHAMSTOW.

This building is now completed. The base of the exterior to a height of 6ft. is faced with brown glazed bricks, above this—to the height of the first floor—the walling is of red bricks finished with a stone cornice. The remaining part is finished with stucco work and marble chippings. The roof is in one span, with three gables in front, covered with red tiles. All the main woodwork is painted white. A roadway 12ft. wide at the side of the building forms the approach to the interior. The ground floor measures 50ft., by 43ft., and has a height of 12ft. With the exception of a tinted tiled dado, an ornamental tiled frieze, and ornamental panels to the pilasters, the walls throughout are covered with white tiles. The floor is also laid with tiles; the ceiling is of adamant plaster. There are three blocks of patent steam continuous ovens—twelve in all. Ovens of the description employed are not yet in use in any other bakehouse in London. The saving in fuel and the absence of dirt as compared with the old-fashioned brick ovens, is very marked. Electrical machinery is provided for kneading and other manufacturing purposes, and the whole of the premises are lighted by electricity. The drainage arrangements are all outside the building, and everything about the building is calculated to secure cleanliness. The floor store is on the first floor. It has a safe load-carrying capacity of 2,000 sacks, or 250 tons. The work has been carried out under the superintendence of Mr. J. Williams Dunford, M.S.A., F.I.Inst., architect. The building is situated in St. James'-street, opposite St. James's Church.

## OXFORD BUILDINGS, COLWYN BAY, NORTH WALES.

THESE premises have just been completed from the plans of Messrs. Booth, Chadwick, and Porter, architects, of Manchester and Colwyn Bay. The building occupies a good position in the centre of the town fronting the main road between Abergele and Conway. A part of the premises is let for the purpose of a social club, and another part to a Lodge of local Freemasons. The remainder is let for offices and business purposes. The outside walls are built with a warm, buff-coloured facing brick with deep-red terracotta window heads, panels, stringcourses, &c.; the interior woodwork is all stained walnut colour, and varnished. The whole of the work has been carried out in a substantial manner by Mr. John Roberts, builder, of Colwyn Bay.

## "LATCHMORE," EPPING.

THIS house, built for Mr. C. B. Sworder, is erected upon a pleasantly-situated corner site on the Kendal Lodge Estate, Epping, and commands an extensive view to the south-east from the dining and drawing room windows. The lower portion is built in red bricks; the upper part is brickwork covered with cement rough-cast, the gables being ornamented with timber. The roof is covered with red tiles. There is a large square hall, with staircase, and three sitting-rooms on the ground floor, and on the first and second

floors seven bedrooms. The builder was Mr. Alfred Brown, of Braintree, the building being planned and carried out under the superintendence of Messrs. Pertwee and Hart, architects, 14, Clifford's-inn, Fleet-street, E.C.

## CHIPS.

A meeting of the Municipal and County Engineers' Association has been arranged to be held at Eastbourne on Saturday, June 5.

The district council of Waterloo have decided to spend £16,152 on constructing a new promenade and otherwise improving the shore.

An inquiry is shortly to be held at Wellington into the application of the urban district council to borrow £2,000 for works of water supply.

The borough surveyor of Warrington (Mr. T. Longdin) has prepared a report recommending the construction of a new police building at a total cost of £20,000.

Mr. Morrison, M.P., has promised to bear the expense of adding a chapel to the grammar-school at Giggleswick. The architect is Mr. T. G. Jackson, R.A.

At a special meeting of Helensburgh Police Commissioners held on Monday, a long discussion took place relative to the proposed renewal and extension of the pier, the plans for which had been prepared by Messrs. Leslie and Reid, C.E., Edinburgh. It was eventually resolved to carry out the full scheme of improvements. Five offers for the works were submitted to the meeting; that of the lowest, made by Messrs. James Young and Son, contractors, Edinburgh, was accepted, the amount being £4,932 16s. 7d.

The 400th anniversary of Cabot's discovery of the North American mainland is to be commemorated in Bristol by the erection of an observatory tower on Brandon Hill at a cost of £3,000.

The new chief offices of the Rational Sick and Burial Association, which have been built in Bridge-street, Deansgate, Manchester, were formally opened on Saturday by Mr. E. Strachey, M.P. Delegates were present from all parts of the country. The building, with its site, has cost about £24,000.

Professor Baldwin Brown, Edinburgh, has been invited to deliver in Dublin a series of six lectures on Ancient and Medieval Art before the Royal Dublin Society. The lectures will be given in the Society's new lecture-theatre three days each week, beginning on Monday next, the 26th inst.

The Rev. J. W. Bellamy, D.D., has contributed £1,000 towards the restoration of Gedney parish church, and the work is now in hand. Dr. Bellamy, in 1891, at a cost of £850, restored a portion of the church.

Of the £15,000 required for the restoration of the tower and spire of Salisbury Cathedral over £11,300 has been subscribed up to the present time.

Dr. R. Deane Sweeting has held an inquiry into the application of the rural district council of Christchurch, Hants, for leave to borrow £5,000 for the erection of an infectious diseases hospital.

At the beginning of the present year the total length of railways open for traffic in Russia was 25,975 miles, of which 15,230 belong to the State, exclusive of the 945 miles of the Transcaspian Railway, which is in the hands of the Ministry of War. About 6,000 miles of line are in course of construction, and it is estimated that by the end of the century there will be something like 32,000 miles of railway in the Russian Empire, two-thirds belonging to the State.

A service for the dedication of a new chancel screen in carved oak, a marble and mosaic pavement in the chancel, and new altar hangings was held at Holy Trinity Church, Bury, Lancs, on Saturday evening.

The Prince of Wales will open the new buildings of the Sarah Acland Home for Nurses at Oxford on the 12th prox.

The death was reported from Paris on Wednesday, at the age of 50, of M. Paul Blondel, who two years ago was appointed architect to the Louvre and Tuileries.

The decoration of the parish church of Sheepwash, Devon, has just been completed. It has been designed and executed by Messrs. Fouracre, of Plymouth, who had previously filled many of the windows with stained glass. The wood carving is by Mr. Herbert Read, of Exeter.

A new public school for Denny, N.B., erected at a cost of £7,000, to accommodate 526 scholars, was opened on Monday by Dr. Stewart, Glasgow, H.M. inspector of schools.

At Musselburgh Town Council meeting on Monday, Mr. George Landale, Edinburgh, was appointed burgh surveyor at a salary of £120 per annum.





NEW LAW UNION & CROWN INSURANCE CO'S BUILDINGS BRISTOL. HENRY WILLIAMS ARCHT.

**LAW UNION AND CROWN INSURANCE COMPANY'S BUILDINGS, BRISTOL.**

**T**HIS building, now in course of erection, occupies a corner site at the junction of Clare-street and Marsh-street. There are three entrances to the premises. The main one, being at the corner, leads to the company's office. The various offices over ground floor are approached by an entrance in Clare-street, while the offices in the

rear of ground floor will be entered from Marsh-street. The interior will be elaborately fitted in accordance with the general design. The architect is Mr. Henry Williams, and the builder is Mr. John Perrott, both of Bristol.

A laundry and other adjuncts are about to be added to the Royal Lunatic Asylum at Aberdeen, from plans by Messrs. Smith and Kelly, of that city.

The rural district council of Brampton are applying to the Local Government Board for sanction to borrow money for the water-supply scheme at Castlecarrock, Irthlington, and Hayton.

At the meeting of the Stockton Board of Guardians the Workhouse Accommodation Committee reported that they had secured suitable sites for the four semi-detached cottage homes (or eight houses) which they proposed to build at an estimated cost of £5,000.





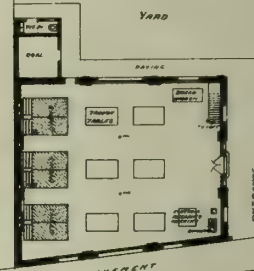


HOUSE AT BREASTON · DERBY.

MESS<sup>RS</sup> MARSHALL & TURNER ARCH<sup>TS</sup>



**"EVERETT'S STORES"**  
**NEW BAKERY BUILDINGS**  
**WALTHAMSTOW**



ST. JAMES' STREET  
GROUND PLAN.

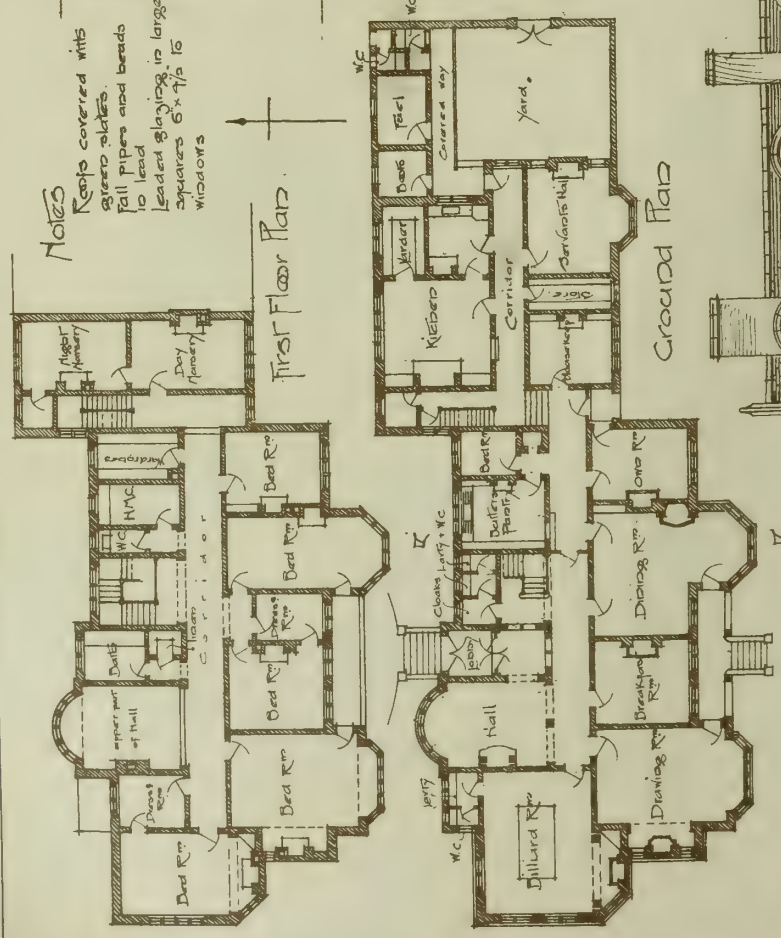




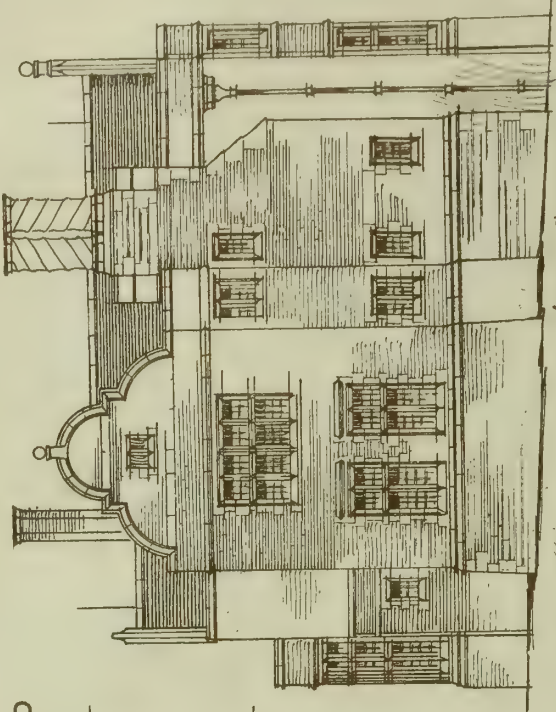




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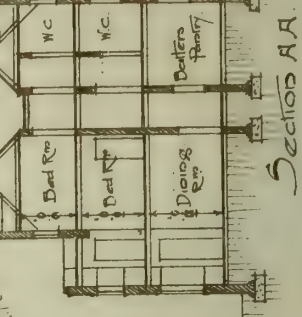
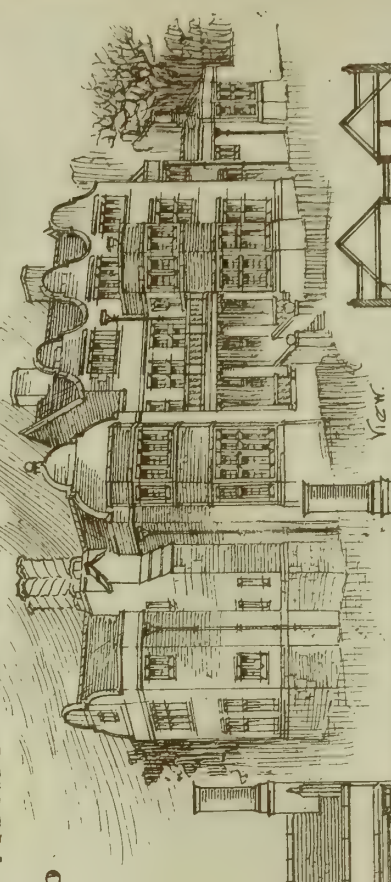


**Notes**  
Roofs covered with green slates.  
Fall pipes and beads to lead  
leaded glazing in large  
squares 6 x 4 1/2 to  
windows

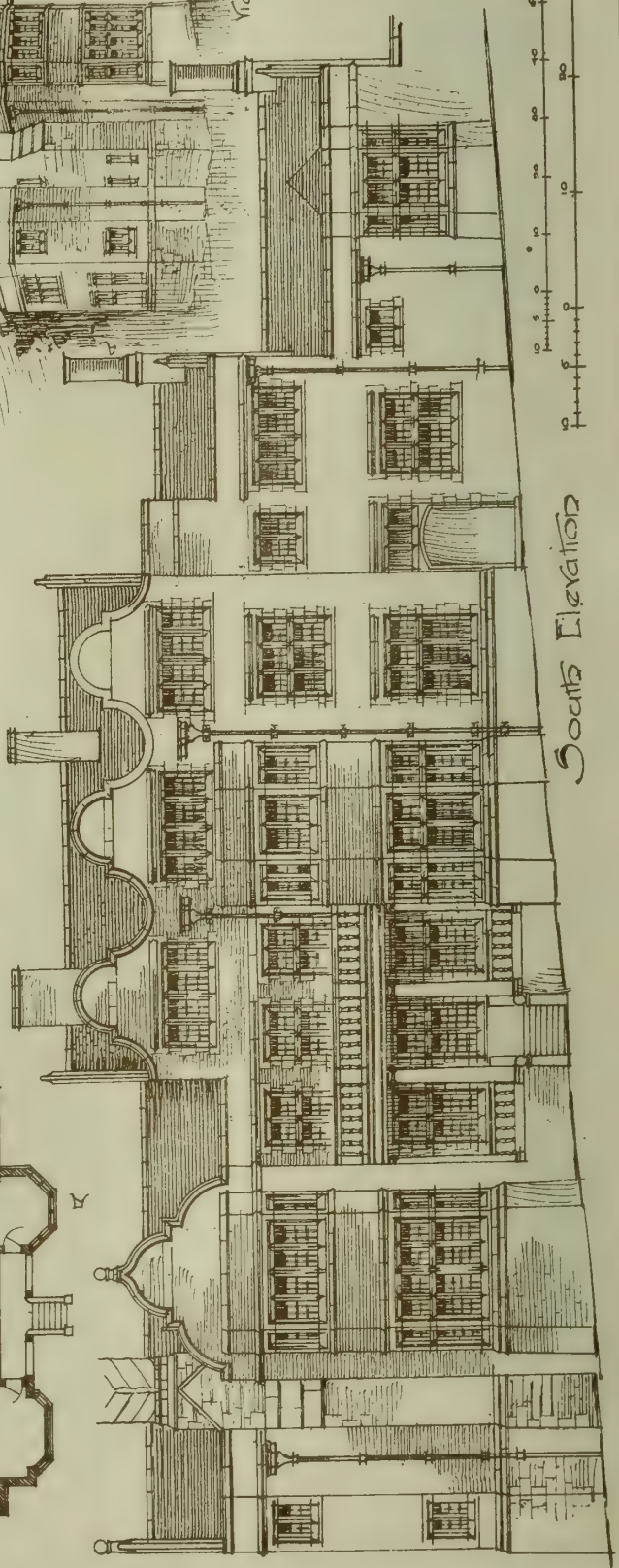


West Elevation

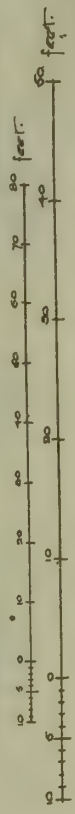
**BND**  
**A Country House**  
by Nap



Section AA



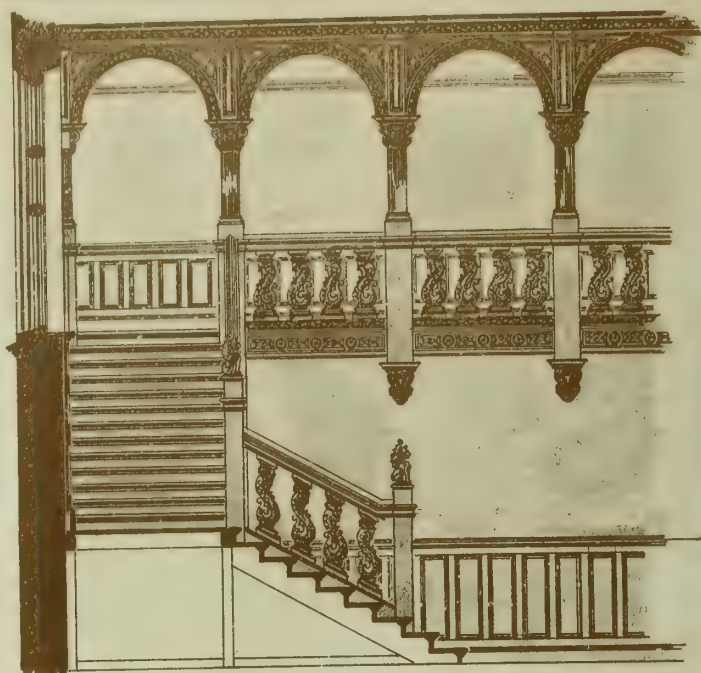
South Elevation









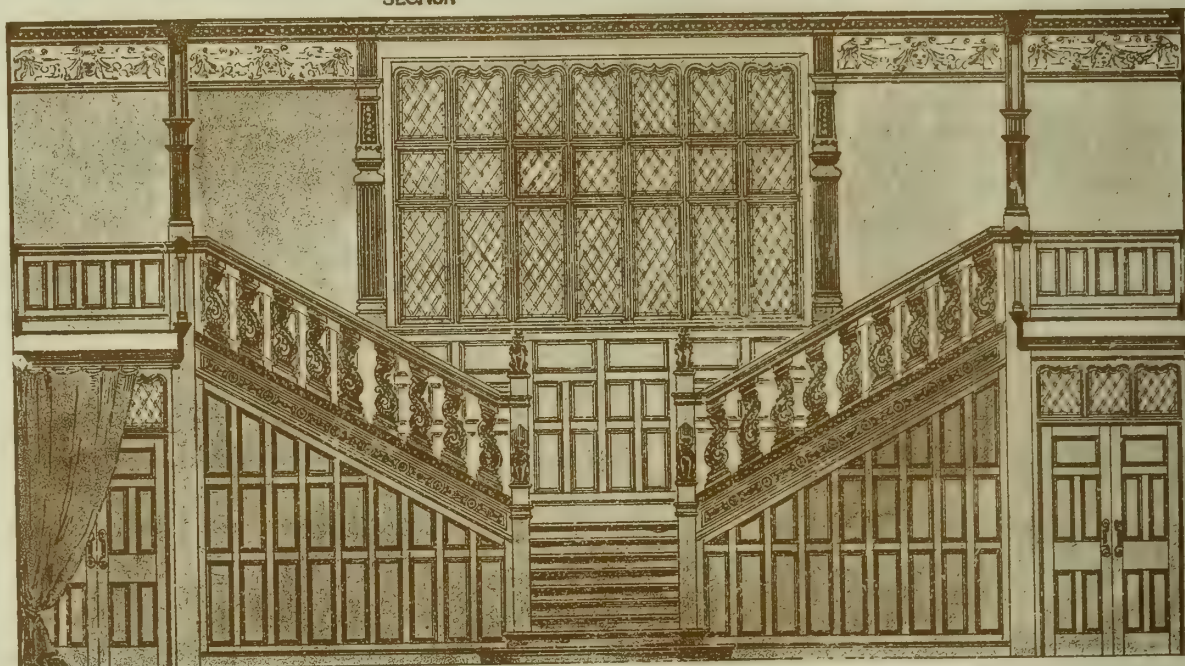


A DESIGN FOR A STAIRCASE IN OAK.

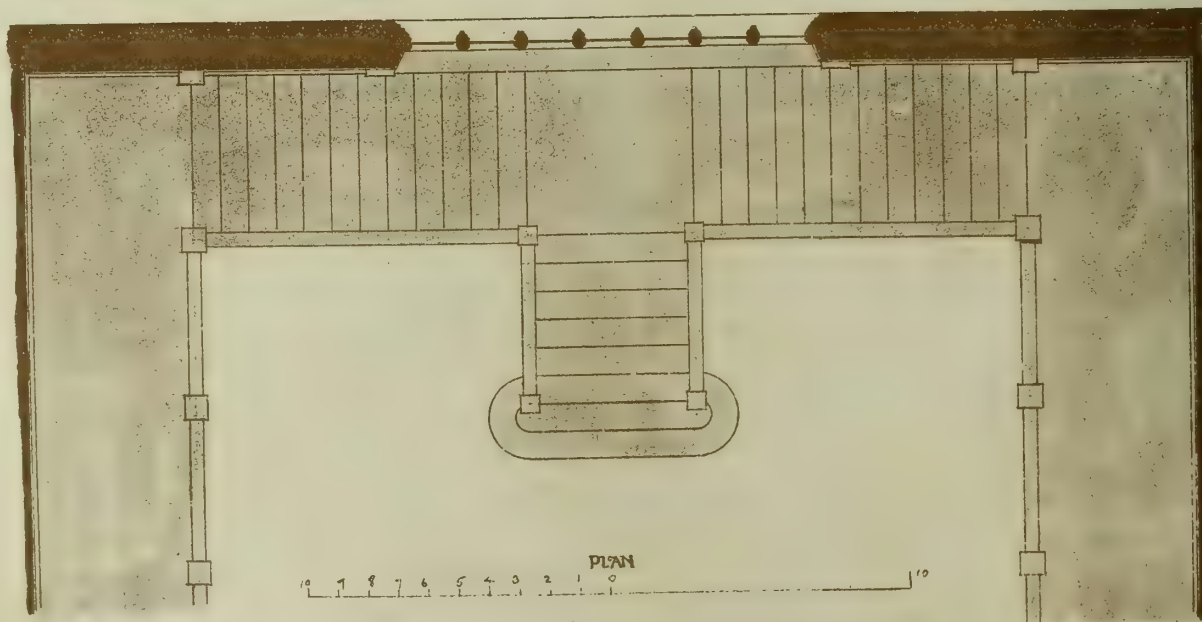
BY MAXWELL AYRTON

~ CHESTER ~

SECTION



ELEVATION







•DETAIL OF ARCHES ROUND GALLERY•

•DESIGN FOR A STAIRCASE•

•IN OAK • BY MAXWELL AYRTON •

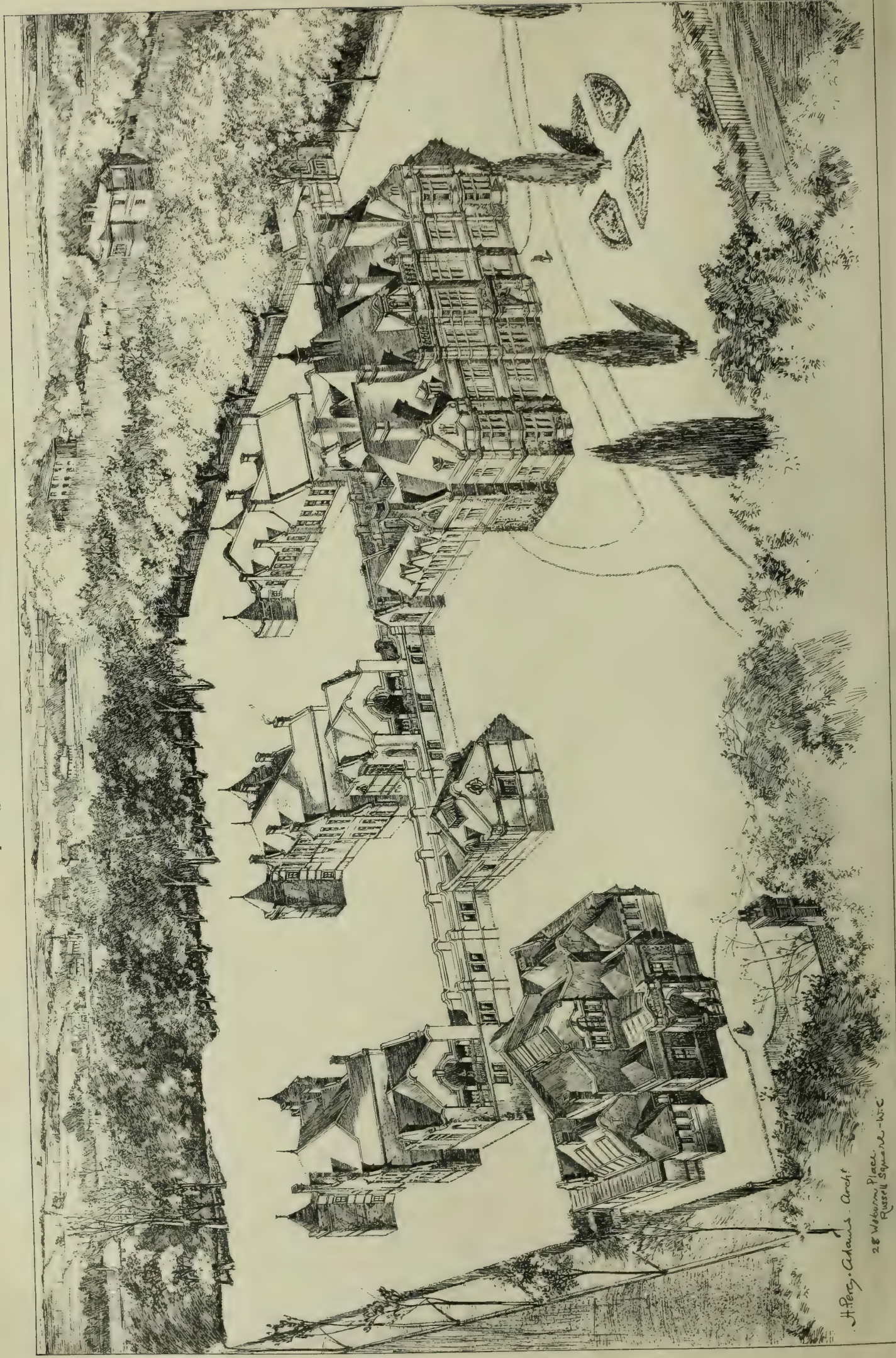








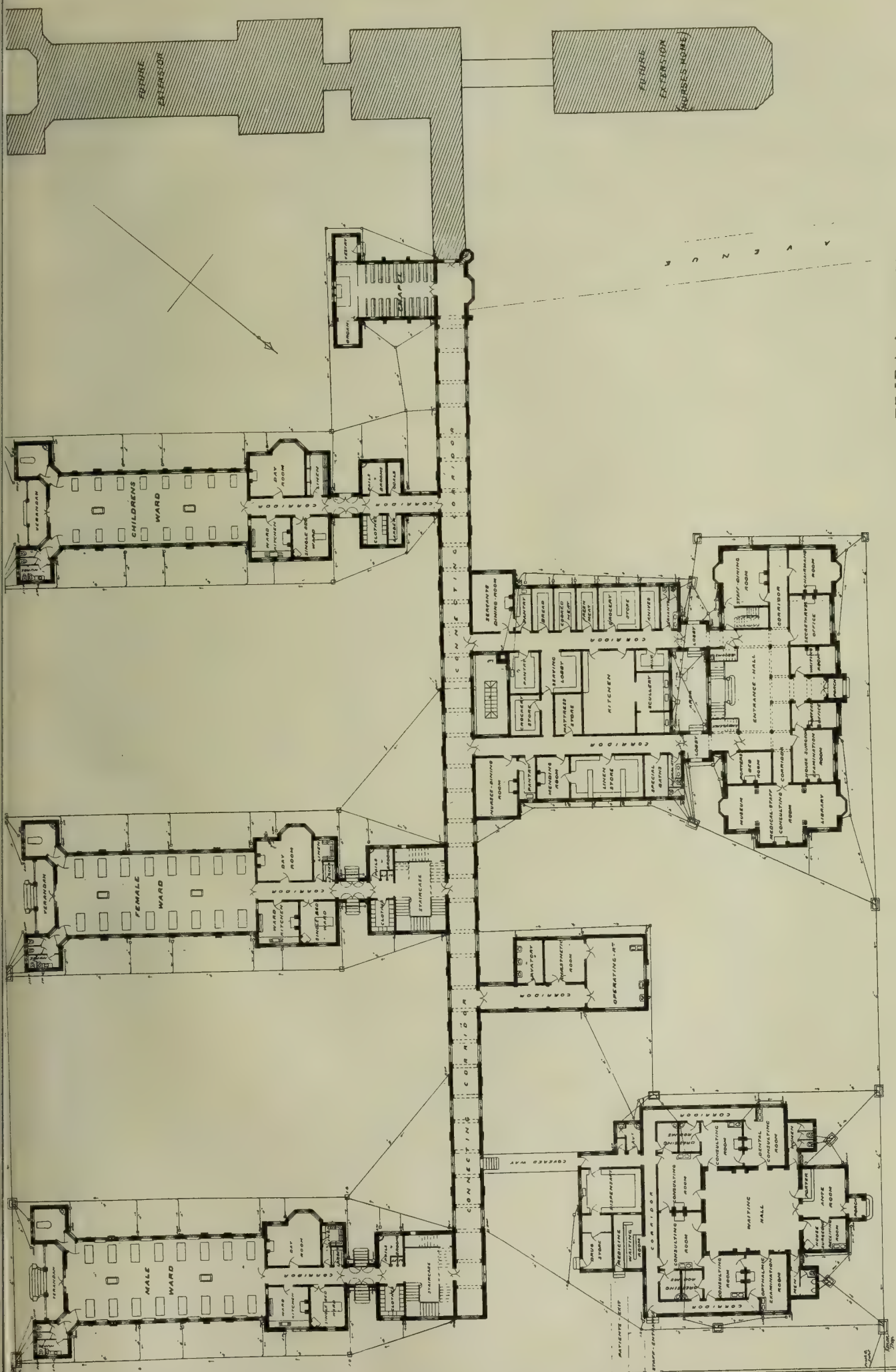




H. Perry, Architect

28 Whitehall Place,  
Russell Square - W.C.





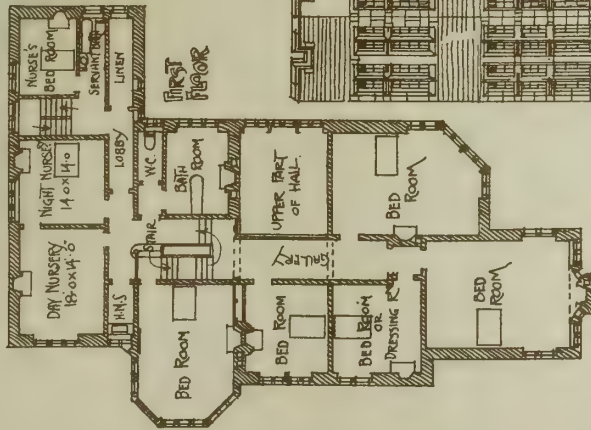
THE NEW BEDFORD COUNTY HOSPITAL.  
H. PERCY ADAMS, F.R.I.B.A. ARCHITECT.



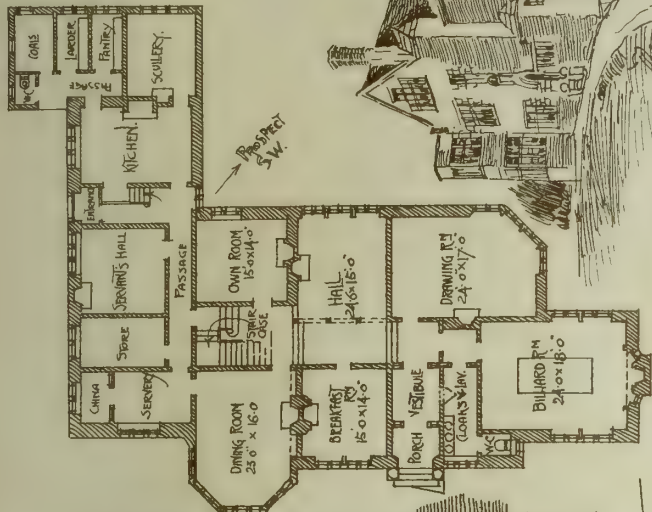
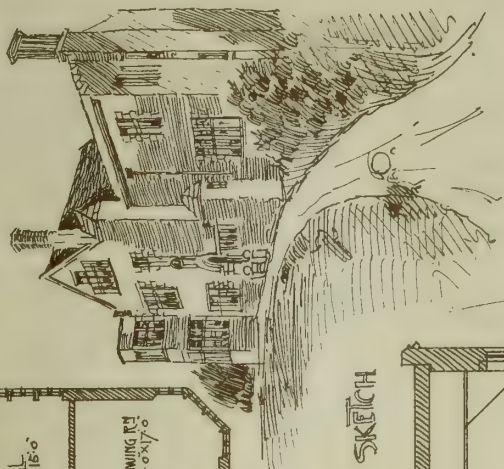




BUILDING NEWS DESIGN CLUB  
DESIGN FOR A COUNTRY HOUSE

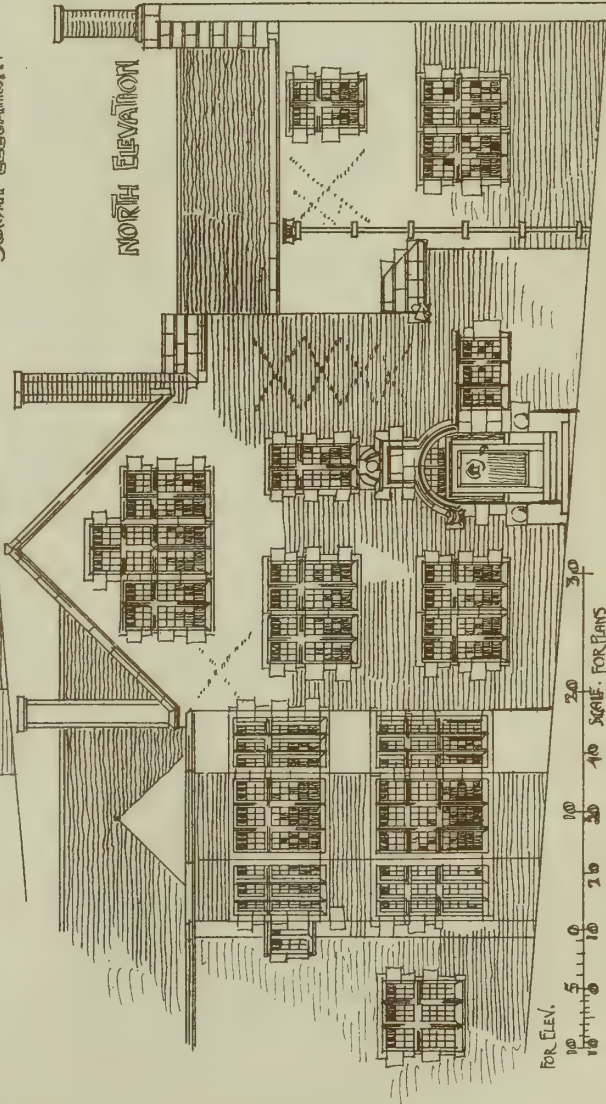


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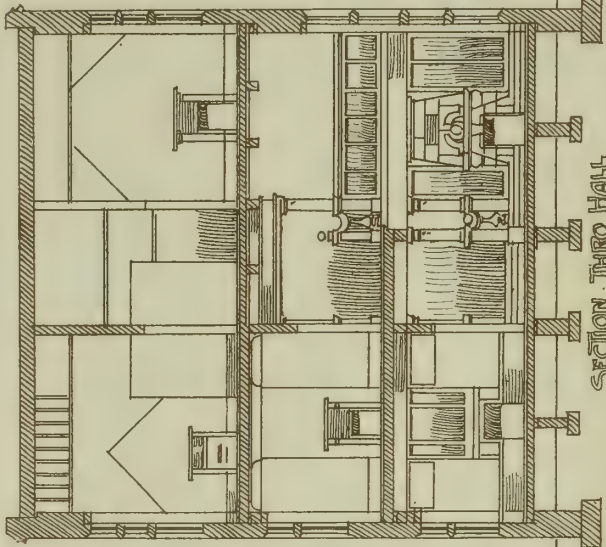
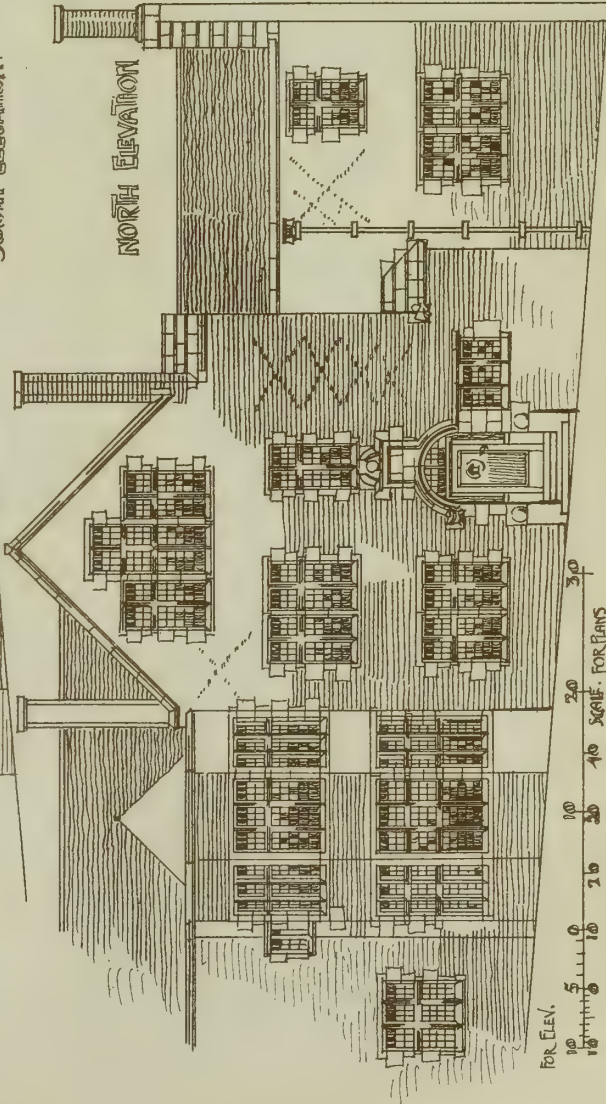


GROUND FLOOR

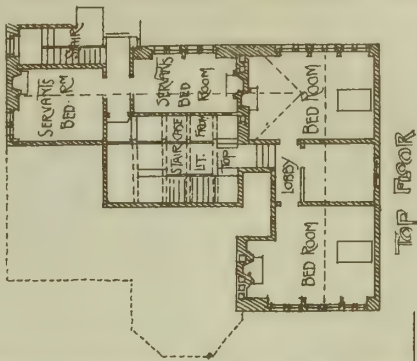
SOUTH ELEVATION



NORTH ELEVATION



SECTION THROUGH THIRD FLOOR



TOP FLOOR

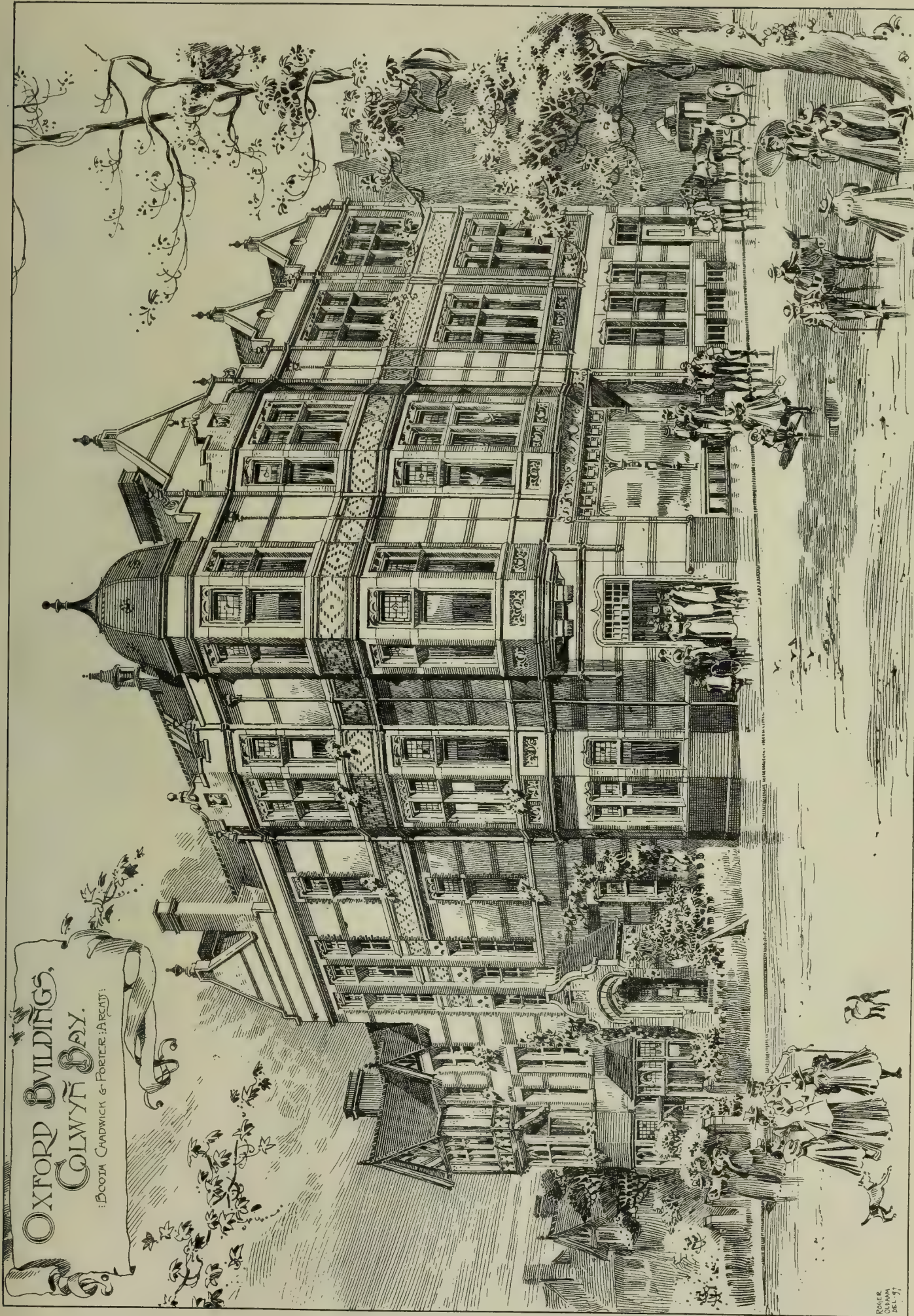






# OXFORD BUILDINGS, GOLWYN BAY.

DESIGN BY CADWICK & PORTER, ARCHT.





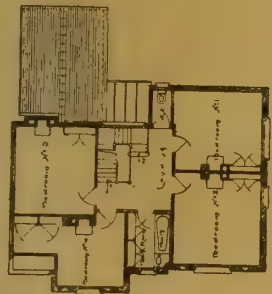




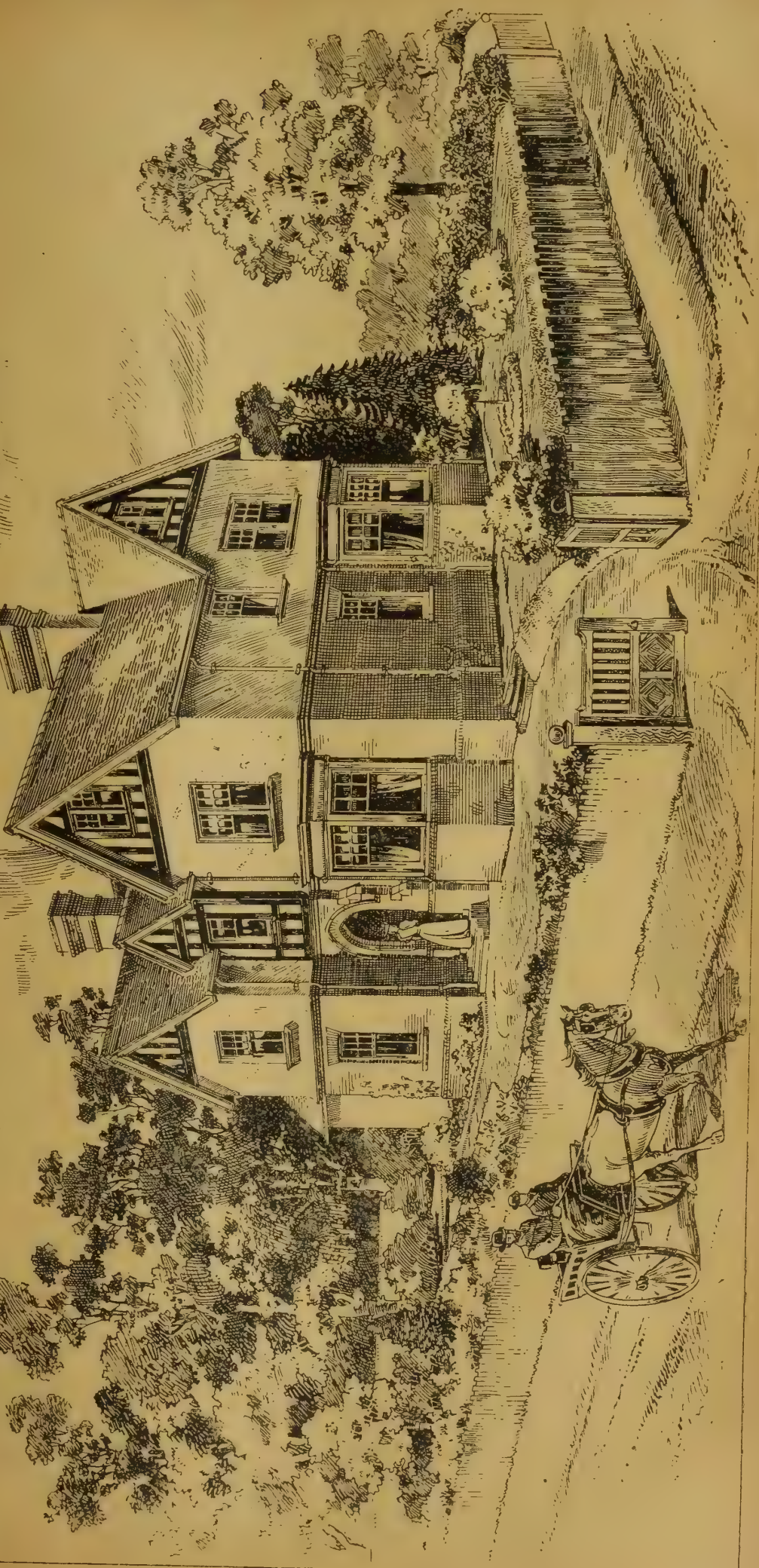
"LATCHMORE" EPPING.  
For C.B. Sworder Esq.  
PERTWEE & HART Architects M<sup>o</sup> S<sup>a</sup> A  
14 Clifford's Inn, Fleet St E.C.



Ground plan.



First floor plan.





## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**GLASGOW MASTER WRIGHTS' ASSOCIATION.**—The twelfth annual general meeting of the members of this association was held on the 15th inst. in the Building Trade Exchange, Mr. John Herbertson, president, in the chair. The annual report and financial statement were submitted by Mr. James L. Selkirk, secretary and treasurer. The report said that the membership was now 102. The directors held themselves ready to advise members in all questions of difficulty and matters of dispute. The past year had been a pretty active one in the building trade, and employers had conceded an advance of an additional  $\frac{1}{2}$ d. per hour to the operatives, making the standard rate now  $9\frac{1}{2}$ d. per hour. There was a feeling, however, that after Whitsunday the pressure of work would considerably abate. The finances showed a credit balance of £36 6s. 10d. Office-bearers were appointed, Mr. Hugh McTaggart being elected president, and Messrs. James Ferguson and Alexander McWilliam, vice-presidents. Mr. T. L. Watson, architect, thereafter addressed the meeting on "Half-holidays in Italy," illustrated by numerous limelight views.

**GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.**—The annual spring visits in connection with the Architectural and Building Construction Classes were made a few days ago, the places selected for special study this year being Edinburgh and Chester. The visit to the former city took place on Monday, 19th inst., when a party of about thirty students was conducted by Professor Gowelay, who had made arrangements for studying the more important works of architectural interest, ancient and modern, in Edinburgh, including St. Giles's Cathedral, St. Mary's Cathedral, St. Margaret's Chapel in the Castle, and the McEwan Hall, while the Museum of Science and Art received much attention in respect of its interesting collection of architectural and other remains. The visit to Chester was made by a party of ten students under the guidance of Mr. James Lockhead, A.R.I.B.A., and extended over four days, which time was principally occupied in studying by sketching, measuring, and photographing in and about the cathedral, St. John's Church, and the numerous half-timber houses and fronts with which the city abounds, and of which the time at disposal only permitted too brief an examination.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The annual general meeting of this society will be held at the Law Library, Union-court, on Monday week, May 3, at 6 o'clock p.m. The annual report of council and financial statement will be submitted and a closing address will be delivered by the President, Mr. George Bradbury. The "house list" of nominations by the council of officers and council for the fiftieth session suggests as president, Mr. W. E. Willink, M.A., F.R.I.B.A.; as vice-presidents, Messrs. H. W. Keef and J. Woolfall, and the re-election of the hon. secretary, Professor F. M. Simpson, and assistant hon. secretary, Mr. Arnold Thornely, A.R.I.B.A.

**PORTSMOUTH MASTER BUILDERS' ASSOCIATION.**—The members of this association held a special meeting at the Sussex Hotel, Landport, on Wednesday evening week, for the purpose of presenting a testimonial to Mr. Councillor J. H. Corke, J.P., ex-president of the association. There was a large attendance, those present including the mayor, Mr. G. E. Couzens, Messrs. C. Dye (president) (who was in the chair), A. E. Porter (vice-chairman), A. Addison (solicitor to the association), T. P. Hall, W. Learmouth, W. Evans, T. Page, C. Harding, J. Crockerell, G. Hoff, A. Springings, E. Springings, J. Scaddan, H. Jones, G. W. Kerwood, S. Kerwood, G. Reading, J. W. White, G. Thomas, &c. In making the presentation, the president remarked that Mr. Corke commenced business in Portsmouth as a contractor 20 years ago, and had carried on an extensive business in the borough ever since. Among the many public buildings he had erected, and which were monuments of his work, were the Central Hotel and Empire Palace. He was one of the founders of the Hospital Saturday movement in 1876, and had been the honorary secretary of it ever since; no less than £12,000 had been handed over to the hospital in connection with that movement. Mr. Corke had also been upon the general management committee of the hospital, and 18 months ago Mr. Corke was elected a vice-president of the institution in recognition of his labours. Mr.

Corke entered the town council 15 years ago as a member for St. Bartholomew's Ward, and had been returned unopposed ever since. He was vice-president of the town hall building committee, and was one of nine appointed to visit the town halls in other places to make a selection for Portsmouth. Three or four years ago he was made a Justice of the Peace. Mr. Corke joined the Builders' Association 15 years ago, and had occupied the presidential chair eight times. In conclusion, Mr. Dye asked Mr. Corke to accept from the association a handsome silver bowl and centre-piece. In returning thanks, Mr. Corke alluded to the presentation of a silver tea and coffee service to him by the association seven years ago. He retired from the chairmanship, not from any desire to shirk his responsibility, but simply owing to ill-health. He promised to continue to do all he could to promote its interests. A smoking concert occupied the remainder of the evening.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The annual general meeting of this society was held on the 13th inst. in the library at the School of Art, Mr. Charles Hadfield, F.R.I.B.A., the president, in the chair. There was a good attendance of members. Mr. C. J. Innocent, hon. sec., read the annual report of the council, which states that the membership has continued to increase. There are at present 34 fellows, 37 associates, 14 students, 5 honorary members, and 18 lay members, making the total number of members 108, as against 103 at the end of the previous year. The council recorded with regret the death of Mr. James Hall, who had been a fellow of the society from its commencement. Several valuable additions have been made to the library during the year. The members of the society had an excursion in June last to Wentworth Woodhouse, where Mr. Dickie, the resident clerk of works, exhibited the plans and details of the various buildings. A suggestion had been made that the society should join other allied societies in the employment by the R.I.B.A. of a lecturer to give a series of lectures to the students of each society in preparation for the examinations, and the council had expressed their willingness to join in the scheme. The statement of accounts was read, and showed a balance in hand of £43 7s. 6d. This statement and the annual report were unanimously adopted. Mr. Mitchell Withers and Mr. E. Winder, jun., were elected scrutineers for the election of officers, which resulted as follows:—President, Mr. R. W. Fowler, F.S.I.; vice-president, Mr. Joseph Smith; treasurer, Mr. F. Fowler, F.S.I.; honorary secretary, Mr. C. J. Innocent, F.R.I.B.A., F.S.I.; council, Messrs. A. Smith Denton, H. W. Lockwood, W. F. Hemsoll, T. Winder, and W. C. Fenton.

## CHIPS.

The Urban District Council of Ilford have agreed to apply to the Local Government Board for permission to borrow a sum not exceeding £12,000 for purchasing, laying-out, and fencing a piece of land, with a lake, forming a part of Valentine's Estate, for the purpose of a public park.

The partnership hitherto subsisting between F. H. Dancaster and A. C. Taylor, architects and surveyors, Southampton, under the style of Dancaster and Taylor, has been dissolved.

Mr. and Mrs. Bayard will visit the colony established by the National Society for the Employment of Epileptics at Chalfont St. Peter on Thursday, the 6th of May, when his Excellency will lay the foundation stone of a new home for male epileptics, and Mrs. Bayard will open the home recently erected for female epileptics.

The sub-committee of Glasgow Corporation appointed to deal with the sewage scheme for the south side of Glasgow have agreed to recommend the corporation to prepare a Bill to be presented in Parliament next session to deal with the whole question. The proposed Bill will provide for the carrying of the sewage to a point beyond Govan, and will furnish an efficient and economical plan, not only for Glasgow, but for Govan and Kinning Park as well.

The old red brick flooring of the chancel of the parish church of Solihull has been replaced by handsome tiles, and, by the removal of the stairs to the upper chapel (St. Alphege's), the ancient staircase was discovered. This has been restored in stone, and the Communion-rails and the old chancel-screen have been restored to their original positions. Among the special gifts are a carved oak litany desk, brass gas-standards for the sanctuary, and an embossed alms-dish.

## ARCHÆOLOGICAL.

**THE EXCAVATIONS AT SILCHESTER.**—At the last meeting of the Society of Antiquaries, held at Burlington House, Mr. W. H. St. John Hope, the assistant secretary, read an exhaustive report on the results of the excavations made at Silchester during the course of last year. Sir Henry Howarth, M.P., was in the chair. The paper was fully illustrated by photographs, and a water-colour drawing, by Mr. G. E. Fox, of the newly-discovered small gateway in the western wall of the city. The two insulae, or blocks, explored in 1896 are numbered 15 and 16 on the great plan on which the extent of each year's operations is recorded. Insula XV. adjoins the western wall, and between it and the principal western gate to the northward lies Insula XIV., excavated in 1895. During the course of last year's work a hitherto unknown gateway was revealed in the western wall, to the south of the main entrance to the city on this side. Sections of the ditch outside the wall disclosed the fact that there had been a mound in the centre of the ditch, the object of which was, no doubt, to serve as a foundation for the trestle for supporting the drawbridge. A similar mound was found some years ago in front of the Aldersgate entrance to the Roman City of London. Insula XVI. is situated to the east of Insula XV., and is separated from the central Insula (No. IV.) containing the forum, by Insula III., explored in 1891. The portion of the area of Silchester laid bare in 1896 was therefore on the outskirts, and, as in the case of the other insulae occupying a similar position next the outside wall, the buildings found, instead of being the dwellings of wealthy citizens, such as those in the more central parts of the city, turned out to be chiefly dye-works and factories. A considerable space in these insulae was unoccupied by structures of any kind, and it was surmised that this vacant area may have been used as the bleaching grounds of the dyeworks. In 1895 the first example of a Romano-British pump was dug up at Silchester. Further light has now been thrown on the hydraulic engineering of the period by the discovery of a line of wooden water-pipes, with peculiar joints made with iron rings, similar to those used in Gaul, and of a well, lined with wood and flint rubble, in an unusually good state of preservation. The well was sunk to a depth of about 18ft., partly through vegetable mould and partly through gravel, until an impervious bed of clay was reached. At the bottom of the well was a rectangular frame, constructed of four oak timbers, jointed at the corners like an Oxford picture-frame. Above this was a tub 5ft. high, and about 3ft. 6in. in diameter, wider at the top than at the bottom, and made of 26 fir staves. The remaining portion of the interior of the well above the tub was lined with a wall of flint rubble. Considerable discussion took place as to whether it was possible that the wooden tub could have been used as what well-sinkers call a "curb," for building the flint steining upon; but the fact that the sides of the tub are contracted towards the bottom instead of sloping outwards is decidedly against the curb theory. Several of the staves of the tub were branded with the letters "H.E.R.M." In the seven years since the work at Silchester began 60 out of a total of 100 acres have been explored. Mr. St. John Hope suggested that it would be an appropriate way of celebrating the Diamond Jubilee of Her Majesty's reign if double the usual area were to be undertaken during the present year.

At a special meeting of the Newcastle Farmers' Club, held in the town hall, the President, Sir John W. B. Riddell, Bart., presiding, a paper was read by Mr. D. Balfour, M.Inst.C.E., F.G.S., &c., civil engineer, of Newcastle-on-Tyne and Edinburgh, on "The Purification of Sewage by the various Processes up to Date—viz., Tidal, Land, Chemical, Bacteriological, &c."

The new museum of Egyptian antiquities at Cairo, of which the foundation stone was recently laid, is from the designs of a French architect, M. Dourgnon, selected in open competition, and the building is to be completed by March, 1899. It will be 125 metres square, with a mean height of some 22 metres, so that the Italian firm who have undertaken the contract have a heavy task before them. The credit at present voted for the undertaking is £110,000; the contractors' estimate is about £17,000 less than that figure; but this balance will be none too large to cover all the extra expenses which will be incurred before the building is ready to receive the treasures of Ghizeh.



## Building Intelligence.

**BURY, LANCS.**—The laying of memorial-stones of the Congregational chapel which is being built at Park, on the site of a chapel erected nearly a hundred years ago, took place on Friday. The architect is Mr. J. D. Mould, of Bury, Manchester, and London. The side walls of the new chapel will stand in exactly the same position as those of the old one. The gable-end wall is to be brought forward to the position occupied by the old vestry, and the chapel is accordingly to be lengthened by that distance. A new rostrum will be placed at the east end of the building. The east end wall will be curved, and will have a recess beyond it to hold choir seats. The vestibule, which is to run the whole width of the building, is to be 39ft. long by 10ft. wide. The dimensions of the new chapel inclusive will be 66ft. in length by 39ft. in width. The organ chamber will project beyond this another 10ft. At the south-east angle of the building will be placed a vestry 16ft. by 17ft. Over the vestibule will be a gallery seating about 100 persons. The total accommodation of the chapel will be about 450; the accommodation of the old chapel was about 350. Eight of the benches will be on the square plan favoured by our forefathers, but will not be so high. There will be accommodation for a choir numbering 55. The style of the building will be Early Jacobean. The whole of the chapel will be faced with Yorkshire parpouts with Fletcher Bank stonemouldings, sills and dressings. All the timber work inside the building will be of pitchpine, including the open roof. The bell turret, which was placed on the old chapel some years ago at considerable cost, will reappear on the new building, which is to be divided in its length into six bays. The contractors for the whole of the work are Messrs. T. and J. Foster, of Ramsbottom, under whom Mr. J. H. Horworth, Ramsbottom, is to carry out the joiners' work.

**DEWSBURY.**—A large shed at Ratcliffe Mills, Dewsbury, belonging to Messrs. Wormald and Walker, Limited, is now almost completed. The building is about 200ft. square, and consists of a basement with a floor area of about 3,100 superficial yards. Eighty-eight cast-iron columns support the floor above, which is constructed with steel girders and joists from the works of Messrs. Dorman, Long, and Co., of Middlesbrough. The roof of the shed is supported on 96 columns of special design and manufacture, as are those also below. In addition to these two large places, a couple of rooms, 40ft. by 15ft. each, are provided for tentering machines, one room 31ft. by 30ft. for burring machines, and an engine-house consisting of engine-room 61ft. 6in. by 14ft., and dynamo-room 14ft. 9in. by 14ft. The walls of the engine-house are lined with enamelled bricks, and the ceiling is of pitch-pine. The engine-bed is of Horsforth ashlar, 10ft. deep, resting upon a concrete bed of considerable depth. The total cost of the building, exclusive of ground, machinery, and lighting, is over £10,000. The architects are Messrs. C. H. Marriott and Son, of Dewsbury.

**HOLBORN.**—The Easter services at St. Alban's Church, Holborn, commenced with the blessing of the new triptych and an image of the Blessed Virgin. The central piece of the triptych is a rectangle 15ft. 6in. in height by 13ft. 6in. in breadth. It rests upon a panelled base, which shows 4ft. in height clear above the bronze and marble gradine of the altar. On three sides of the rectangle, framing it in, is a vine of which the leaves and fruits and waving stem stand out clear against a dark background. The inclosed area is divided into six compartments, three above three, of which the middle division of the upper level is filled by the figure of St. Alban. The general subject of the whole is "The Passion of St. Alban." All the subjects are carved in alabaster, vellum white. Important lines and features of the sculpture are gilt, the draperies of conspicuous persons being diapered with gold patterns, and the lining of the drapery coloured pale blue. These panels of alabaster are set in a massive frame of oak, and have rich canopies above them. Miniature buttresses, stepped and pinnaced, divide the subject. An inscription in Latin runs the whole length of the upper portion of the frame. Above the inscription is a cresting of pierced flower-work, with a shield at each end and in the middle. Behind each shield the capital of a column rises, supporting in the centre a seated figure of Our

Lord, crowned and with hand uplifted in blessing. The figure to His right is our Blessed Lady, and to His left the Angel Gabriel with a lily. This altar-piece has been designed by Messrs. Bodley and Garner.

**NEWCASTLE-ON-TYNE.**—One of the most important developments of Newcastle during recent years is now, says the *Newcastle Chronicle*, proceeding apace—that of building on the West Jesmond estate a thousand houses for the accommodation of the ever-increasing population of the city. The land lies to the north-east of the city, between Osborne-road on the north and St. Andrew's cemetery on the Moor Edge, North-road, in the south, while on the west it is bounded by the intakes on the Town Moor, and on the east by St. George's-terrace and Moor View. The whole estate is to occupy three years in building, one-third being built each year. There will be for the purpose of draining the property a large separate common sewer, which Mr. Forsyth, the purchaser of the estate, is now building, at a cost of £7,000; it will be laid down from the estate to the city sewer at Barras Bridge, and will be on the self-flushing principle. It is prescribed in the conditions of sale that all the gardens in front of the houses must be kept as flower gardens, and must each be planted with at least two trees, so that aesthetic appearances are not to be neglected. Two bridges will connect the two halves of the estate separated by the railway. Opposite the station an hotel will be built by the N.E.R. Company. On the other side of the railway co-operative stores will be erected. There are to be in addition some half-dozen shops. A large site has been secured by the school board, on which will be built schools for the new district. The majority of the houses will be flats, but those facing the North-road will be exclusively semi-detached villas. Much indignation and protestation on the part of the residents and owners of Moor View and St. George's-terrace were provoked by the prospect of the opposite side of the street being occupied by flats, but all to no purpose, seeing that it is perfectly legal for the owners to build flats if so disposed. So far as the Corporation of Newcastle is concerned it can do nothing to prevent the building of flats there or anywhere else in the city.—The foundation stones of a Primitive Methodist church were laid on Monday in Kingsley-terrace, Arthur's Hill. The chapel will replace a similar building in West-street, Arthur's Hill, where the congregation has worshipped for 33 years. It is being erected from the designs of Messrs. Marshall and Dick, architects, of Newcastle, who were selected as the result of a limited competition. The style is a bold but simple treatment of Early Gothic. The church consists of nave and transepts, containing the bulk of the sittings on the ground floor, a small gallery accommodating about 90, occupying the north end over the entrance vestibule. The total accommodation is for about 500. An organ chamber is provided, with arched opening facing into the west transept, where the choir is also to be seated. In the rear, on the church level, are arranged the church parlour. There are also on the lower level an infants' room, a tea boiling room, and heating chamber. Mr. T. Hutchinson, Elswick-road, Newcastle, is the contractor for the work.

**RATHMINES.**—The new town-hall for Rathmines and Rathgar townships will be finished for occupation in July next. The work of erection was commenced early in 1895. The façade to Rathmines-road, which is only 48ft. in extent, is of Dumfries red stone. The clock tower is about 130ft. high, and near its summit will be placed a four-dial illuminated clock, with a peal of five bells, the largest weighing one ton. Mr. Byrne, of Thomas-street, Dublin, is at present engaged casting these bells. Messrs. Chancellor, of Sackville-street, Dublin, have been intrusted with the manufacture of the clock. The buildings run back for a considerable distance—some 200ft. The largest apartment, the assembly hall, will be capable of accommodating 2,000 people. It has a height of 44ft. from floor to ceiling, and is 84ft. in length by 44ft. wide. This hall is on the ground floor, and has six entrances from the main corridor, as well as two entrances to the horseshoe gallery at one end, and two entrances to the stage. This hall, which is practically finished, will be lighted, like the rest of the building, with electric light. The different offices and rooms are fitted with electric bells, and there will also be a telephonic communication between the different departments. The whole place in winter will be heated with

hot air by Grundy's patent. The windows facing the public road are double-sashed, so as to prevent noise; but it has in addition been decided to pave the street with wood setts in front of the town hall. Over the main entrance door is an oriel window projecting 4ft., and supported by a figure-head, which acts as a keystone to the entrance arch. Immediately on entering on the left-hand side is the public office, and beyond this is the secretary's office, off which is built the strong room for the keeping of documents and papers. On the ground floor are also the engineer's offices, the collector's office, and the offices for the heads of the sanitary staff. The board-room on the first floor is approached by the principal staircase, of Portland stone. Amongst the other features of the new town-hall are a gymnasium, a ball-room, lavatories, cloakrooms, kitchen, and caretakers' apartments. It is proposed to convert the present temporary offices occupied by the Commissioners a few doors farther down the road into a public library.

**YEovil.**—The new church of St. Michael and All Angels, which has been built and endowed through the generosity and munificence of the late Mr. Harry Cole (formerly organist of Yeovil Parish Church) and of members of his family, will be dedicated on June 14 by the Bishop of Bath and Wells. The church is constructed of Ham stone, in the 15th-century style. The seating capacity is about 550. It consists of a chancel, nave, and north and south aisles. In the north aisle is a Lady chapel. A prominent feature of the interior of the church will be a carved oak rood-screen, and in harmony with it will be the pulpit, the two altars, choir-stalls, and lectern. Over the altar, in the sanctuary, angel faces are carved out in Ham stone. The tower is square and battlemented, and rises to a height of about 80ft. The drawings provided for pinnacles to the tower; but the experience of a recent gale resulted in the abandonment of them. The architect is Mr. J. Nicholson Johnston, A.R.I.B.A., of Yeovil, and Mr. Pollard, of Bridgewater, has the building contract in hand. The church is heated throughout with modern apparatus, supplied by Messrs. Petter and Sons. Messrs. Harry Hems and Sons, of Exeter, executed the carving work and all the oak fittings.

### CHIPS.

Major-General Crozier, R.E., has held an inquiry into an application of the District Council for Waltham Holy Cross to borrow £3,000 for the erection of 10 cottages at New Waltham, in lieu of dwellings it is proposed to demolish in the widening of Highbridge-street.

The Radcliffe Urban District Council have received sanction from the Local Government Board to the borrowing of £5,800 for the purchase and extension of a market.

The town clerk of Scarborough has been instructed to apply to the Local Government Board for sanction to borrow £16,100 for the Harcourt-place improvement, the object of which is to secure better approaches to the St. Nicholas Cliff.

It has been decided to complete the tower of St. Comgall's parish church, Bangor, Co. Down, and to add to it a stone spire. The architect is Mr. Stephens, of Belfast.

The east end of Holy Trinity Church, Hendford, Yeovil, has been beautified by the addition of a reredos in carved oak, coloured and gilded. The reredos, which consists of a lofty three-gabled framework, contains five painted panels, the centre one being treated with the subject of the Crucifixion, with the figures of the Blessed Virgin and St. John on either side of the cross. From the base of the cross grows the symbolical vine. In the four panels, two on each side, are depicted the figures of the Four Evangelists. The north aisle east window has also been filled in with stained-glass representing the Good Shepherd. The reredos and window, together with other gifts, were dedicated at evening-song on Easter Eve.

The ceremony of turning on an additional water-supply for Melrose was performed on Tuesday by the Duke of Buccleuch, with which great Border family the welfare of Melrose has been so closely identified for generations. Hitherto the inhabitants had their water from the Eildon Hills; it proved insufficient for growing necessities, and the local commissioners recently set about increasing the supply. Messrs. Belfrage and Carfrae, C.E., of Edinburgh, were employed to aid them, with the result that the springs of Allanshaws and Lauder were tapped, and a varying supply of from 20,000 to 50,000 gallons was increased to from 90,000 to 150,000 gallons per day. This has been done at an expenditure of about £10,000.



## Engineering Notes.

**THAMES CONSERVANCY.**—The report of the Thames Conservators for 1896 has just been presented to Parliament, together with a statement of the Conservancy accounts for the same period. Dealing first with the Lower River, that portion of the Thames below London Bridge, the Commissioners refer to the completion of the inquiry instituted by commissioners appointed under the Thames Conservancy Act, 1894, and express concurrence in the opinion of the Commissioners as to the desirability of deepening the river both above and below Gravesend. The Conservators have decided that this work shall be carried out, and have entered into a contract for dredging from the Nore to Gravesend a channel 1,000ft. wide and 26ft. deep at low water of spring tides. They have further resolved to dredge channels of the following dimensions above Gravesend:—From Gravesend to Crayford Ness, 1,000ft. wide and 24ft. deep; from Crayford Ness to the Albert Docks, 500ft. wide and 22ft. deep; and from the Albert Docks to the Millwall Docks, 300ft. wide and 18ft. deep. The Conservators have also adopted the recommendation of the Commissioners to discontinue the deposit of dredged material in the river at Deadman's Hole, and have obtained the sanction of the Board of Trade to the discharge of the material at sea in the Barrow Deep. In order that the survey recently completed may be kept up to date, the Conservators intend to appoint two surveyors to sound and chart the river from the Nore upwards, and to establish a self-registering tide gauge at Southend. Thus in future an official record of the navigable channels of the Thames will always be available, and the information will be of great value to the shipping interests of the port. The dredging plant has been employed in the further improvement of the navigable channel.

**THE NEW BRIDGE ACROSS NIAGARA GORGE.**—During the past fortnight the joining of the two sections of the great new steel arch bridge, which during the past few months has been in course of erection across the Niagara gorge at these Falls, has been completed. This arch is being built to take the place of the old railway suspension bridge, over which the trains of the Grand Trunk Railway have for years crossed the Niagara chasm, and which is familiar to all travellers between Chicago and New York. The work of erecting the bridge has progressed steadily without loss of life, and, indeed, no serious accident has happened on the work. The abutments of the arch are placed about half-way up the slope between the top of the cliff and the water's edge. They are four in number, two on each side of the river, and are built of huge blocks of stone. It is on these abutments that the bed-plates of the arch rest. Preparatory to the erection of the steel superstructure the space between the abutments and the cliffs was filled in with huge scaffolding or false work, on which the end spans of the arch were built. From this point the panels of the arch were fitted piece by piece, gradually nearing the centre, where the last panel was fitted on Sunday, March 28, and on Monday, March 29, the task of joining the two ends took place. At either side of the old suspension bridge, at both the Canadian and New York State ends, great screws were placed, and by means of these screws the sections of the arch were lowered. Between the ends of the two sections there remained a space of about 2in., which required adjusting. The levers of the screws had been manned by gangs of men, and at a given signal they began to turn the levers, which allowed the two sections gradually to come together. The sections met so accurately that the bolt holes matched perfectly. Chief Engineer L. L. Buck was personally in charge. The arch will be completed in June. It will have a span of 550ft., connected at either end with the cliff by a trussed span 115ft. long. It will have an upper and a lower deck. On the upper deck will be laid the tracks for the accommodation of the steam railroads. The suspension bridge has but a single track, while the new arch will have a double track, thus greatly increasing the facilities of crossing the gorge. On the lower floor there will be room for a carriage-way, side walks and trolley car tracks. These trolley tracks will be the first to be stretched across the gorge, and will allow of an exchange of trolley traffic between the two sides of the river, resulting finally in a belt

line between the two countries. In its complete state the new arch will have about 6,000,000lb. of steel in its make-up, and it is expected to carry a load of 10,000lb. to the foot, which is a very heavy load. As it stands to-day the arch is built under and about the old suspension-bridge, which will soon be removed, all, it is expected, without delay to travel. This suspension bridge was first opened in 1855. When originally built the superstructure was of wood, the towers being of stone. In 1880 the suspended structure was renewed in steel, and in 1886 the stone towers were renewed in steel, all under the direction of Mr. Buck, the engineer. The arch is being built by the Pennsylvania Steel Company, of Steelton, Pa., for the Niagara Falls International Bridge Company and the Niagara Falls Suspension Bridge Company, one being a Canadian and the other a New York State incorporation.

### CHIPS.

The town council of Plymouth have adopted Plans by Mr. Hine, of the firm of Hine and Odgers, of that borough, for reseating the council chamber, and providing ante-rooms in connection therewith at a cost of £1,600.

The East Norfolk Highways Committee have elected Mr. Matthew Brown district surveyor for Aylsham.

The Rev. A. V. Baillie, vicar of Plumstead, has received a promise of £700 towards a new chancel from Lord Burton, who has also given a window for the east end. The new chancel will afford accommodation for about 150 additional worshippers.

The members of the Royal Scottish Society of Arts visited the M'Ewan Hall, Edinburgh, on Tuesday night, and were shown over the building by Dr. Rowand Anderson, the architect, who explained to them the principles of construction, and fully described the fabric.

At Great Thornton-street chapel, Hull, last week, a memorial tablet to the memory of Messrs. Reynard and Christie was unveiled. It is Classical in style, executed in alabaster with a central slab of statuary marble, and has been carried out by Messrs. Harry Hems and Sons, of Exeter.

Colonel A. G. Durnford, R.E., has held a Local Government Board inquiry respecting the application of the Northampton Rural District Council to borrow money for the purpose of providing a water supply for the village of Kingsbury.

The annual report to the Corporation of York, of the building inspectors for the year ending 31st December, 1896, state that as regards the west side of the river there was a large increase in the number of dwelling-houses completed, there being double the number of the preceding year. There is also a large number approaching completion. There have been many extensions and enlargements of business and residential premises. On the east side of the river also a large number of dwelling-houses have been erected on the Bootham, Clifton, Burton Stone-lane, Wigginton-road, and Haxby-road building estates. Many additions and alterations have also been made to business and other premises.

The first completed block of buildings forming the Clarence Barracks, Portsmouth, was taken over on Thursday in last week, for the first time, by Companies 34 and 14 of the Royal Artillery, from the old Cambridge Barracks.

At a meeting of the townsmen of Paisley, held last week, Provost Mackenzie, who presided, intimated his intention to build and equip an eye infirmary and present it to the town as his contribution to the commemorative offerings. It is understood that the infirmary, which will by its name perpetuate the Diamond Jubilee, will cost between £3,000 and £4,000.

New secondary schools at Dryfesdale, Lockerbie, were formally opened on Friday. The buildings, which have been erected at a cost of £4,300, include a workshop (in which manual training is taught), the cookery kitchen, the sewing-room, and three classrooms; and upstairs a lecture-room and laboratory. The architect is Mr. F. J. C. Carruthers, of Dumfries.

A Litany desk and a credence table have been introduced into the Ripon Cathedral services. The former was presented some years ago by the late Bishop of Hereford, but was not regularly used. The credence table is of carved oak, having been constructed under the supervision of Mr. H. Rogers, of Leeds.

The laying of new water pipes in High-street, Berwick-on-Tweed, has revealed, near the Black Bull Yard, at a depth of 4ft. from the surface, foundations of a substantial nature. These are the foundations of the Main Guard, which stood at this place from 1741 to 1815, when it was removed to the present quarters adjoining the Quay Walls.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., L.I., L.II., L.III., L.IV., L.V., L.VI., L.VII., L.VIII., L.IX., L.X., L.XI., L.XII., L.XIII., L.XIV., L.XV., L.XVI., L.XVII., L.XVIII., L.XIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

EAST SUFFOLK. (Yes; Batsford, 94, High Holborn, W.C.)

RECEIVED.—P. J. and T. W.—P. B. W. Co.—F. M. T.—S. C. B. and Co.—A. W. C.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Percy," "St. Leonard," "The Maxman," "Pantile," "Pickles," "Tyke," "Ulan," "Kwajee," "The Dingo," "Geisha," "Nut," "Nap," "Mist," "The Mammoth."

## Correspondence.

### THE R.I.B.A. ELECTIONS.

To the Editor of the BUILDING NEWS.

SIR,—The list of members nominated to serve upon the council and standing committee of the Institute has just been issued.

On the four committees there are 64 positions to fill up, and for these no less than 60 existing committee men are self-nominated. This is unfair to those who may wish to take their turn, and contrary to the best interests of the Institute, for there is an unfortunate tendency causing members of the Institute to vote for those candidates who have the asterisk before their names denoting them to be already in office; still more unfortunately, not one-fourth of the members trouble to vote at all, probably on account of those repeated self-renominations, which tend to keep out a fair proportion of new men and fresh idea. Surely it should be compulsory that a few each year should not be eligible for re-election, so as to give others a chance.

With regard to the council matters are even worse. The president, vice-presidents, secretary, and members of council number 24 persons, and 23 of these gentlemen have (officially) renominated themselves for election; therefore, having in view the manifest advantage of the asterisk, there is but little prospect for the very few names to appear in the list of the new council.

If all the members throughout the country



would take the trouble to vote the result of the elections might be very different, and new men might bring the Institute back to its former state of prosperity.

Although the income of the Institute is vastly greater than when I joined more than 20 years ago, yet its publications are not now to be compared with what have been given in the past. We used to have a large handsome yearly volume, beautifully illustrated, now only a fortnightly journal, with a higher price marked on its outside page than its contents usually warrant.—I am, &c.,  
METROPOLITAN FELLOW.

London, April 17.

#### DECORI CIVIUM.

SIR,—In passing through Trafalgar-square the uniform dull, gruesome greyness of the place distresses one. It is folly to call the Square "the finest site in Europe," but, incontestably, it is the best in London. It, however, has its share of that general squalor appertaining to the great Metropolis. The wealthiest and ugliest city in the world! Improvement, however, is possible if advantage was taken of the capabilities of the place. As we are expecting soon an immense influx of distinguished visitors, it would now be well worth while to effect an improvement. In the first place the fountains are poor for so important a position, and, as being our only aqueous display, there ought to be something more than single jets. In the centres of the quadrants forming the large basins I would add other jets playing, say, 9ft. high, with four others round these of lesser height—twenty additional jets to each basin. On the eight larger pedestals of the terrace I would put large, handsome marble vases to hold flowers, and occupy the lesser pedestals with bronze standards for lights. Along this terrace on upper level, now a deserted place, I would range a row of trees in boxes—orange, camellias, &c., as fine as can be got—and another row in front of the terrace below. At the angles of the fountain basins could be groups of palms. On the two flights of steps should be myrtle and bay trees in boxes at ends of each step; another row of trees I would place right and left of the Nelson column just behind the granite posts.

To make the place complete the vacant pedestal at the north-west corner should be occupied by an equestrian statue of the Queen, as a memorial of the present occasion, as soon as possible. Subscription to hospital funds is very well in its way, but something more personal and purely honorary is due; of course, the funds must come from the House of Commons. The palms that are sunk in the grass plats of the National Gallery are an improvement and a step in the right direction. The same thing should be done at the British Museum and elsewhere.

Whilst architecture is a most important embellishment to a garden, floral and arboreal beauties well become a building, even the finest.—I am, &c.,  
M.

#### TOOL MARKS TO SHOW.

SIR,—Having contracted to make some chancel fittings in oak, the architect specifies "Tool marks to show." What does this mean? He also adds, "No finely finished work." How may this second clause be defined? With some practical acquaintance with ancient carpentry and joinery we are aware that before the introduction of planes, panels, &c., were chopped out with an adze; but, so far as we are aware, tool marks do not show in modern ecclesiastical oak work. Will some practical or theoretical reader very kindly explain the meaning of the two sentences quoted, and say whether the architectural profession generally are in the habit of making such conditions?—We are, &c.,  
COUNTRY CONTRACTORS.

The tenders for the extension of Ostend harbour and docks, which was provisionally estimated to cost nine millions of francs (£360,000), were opened on Friday at Bruges, before Baron Ruzette, governor of the province. One half of the cost is to be paid by the town of Ostend and the remainder by the Belgian Government. There were three tenders only—that of a firm at Roulers, West Flanders, 9,435,800 francs; a Bruges firm 9,470,000 francs, and a Paris firm 12,340,030 francs. The tenders will be submitted to the Government at Brussels for final decision. The works include the extension of the outer harbour, the building of a sea-wall 850 yards in length, a new dock with 3,000 yards of quay space, bridges, alteration to roads, &c.

## Intercommunication.

### QUESTIONS.

[11654].—**Sewerage.**—Can any reader kindly give names of writer and publisher of a good recent work on sewerage of towns and villages by some well-known authority? Also one on drainage of houses by a recognised authority on the subject?—C. E.

### REPLIES.

[11649].—**Clerk of Works.**—The clerk of works is the architect's or employer's representative, and, of course, is paid by the employer, and dismissed by him or his architect.—ARCHITECT.

[11650].—**Lunatic Asylums.**—This series appeared in 1894. See BUILDING NEWS, Vol. LXVII. pp. 54, 177, 221, 263, 328, 398, &c.—CONSTANT READER.

## WATER SUPPLY AND SANITARY MATTERS.

STOCKTON.—The Stockton Rural District Council at their last meeting had under consideration a report from Mr. D. Balfour, M.Inst.C.E., of Newcastle-on-Tyne and Edinburgh, of alternate schemes for the efficient sewerage of Hartburn and Fairfield in their district. The scheme comprises the necessary main sewers in conjunction with an outfall sewer, delivering to the nearest point of the River Tees where sufficiently tidal, after passing through subsiding tanks. This method is recommended in the circumstances by the engineer as most advisable, rather than by the other means available of sewage treatment by chemical precipitation along with the necessary land.

### CHIPS.

At a meeting of the West Hartlepool Town Council (in committee), an offer by the N.E.R. Co. with respect to the sea-banks between West Hartlepool and Seaton Carew was considered. It was decided to recommend the council to accept the railway company's offer to sell 18 acres at £100 an acre for the purposes of a promenade.

Mr. George Hornblower is the architect for the Cottage Homes the Linen and Woollen Drapers' Institution is about to erect at Hendon, at a cost of £12,846.

The dedication stone of the hall and vestry about to be built in connection with the parish church of Dundee was laid on the 13th inst. The buildings will cost £4,000, and will agree in style with the adjoining church.

The city council of Liverpool have adopted a recommendation to convert the spare land on the right side of Gardner's-drive, prescoting the upper portion of Newsham Park to Prescott-road, into a boulevard, the central walk to contain fountains and a band stand, while the outer border will be planted with forest trees and the inner border with shrubbery. The scheme is estimated to cost £8,000.

The Estate and Property Committee of the Newcastle-on-Tyne Corporation have recently been devoting a good deal of attention to the development of their Walker and Willington estate. Plans have been submitted for the building of two or three hundred houses in the neighbourhood of Chillingham-road. The North-Eastern Railway Company are applying for land to make some extension to Walker Station, and other parts of the corporation estate are in negotiation. Wallsend has greatly increased in the last year or two, and it is probable that before very long there will be no break in the houses between Wallsend and Heaton;

The building trade in Bristol has, according to the annual report just issued by the Chamber of Commerce of that city, been more active during the past year than for the previous five or six years. The improvement in trade generally has necessitated the erection and extension of many factories and business buildings in Bristol and the West of England. Prices have shown some improvement, and the trade throughout the year has been without labour disputes. Workmen in all branches have found ample employment. Prices of building materials are high, and in some branches still rising. Speaking generally, the outlook for the coming year is, perhaps, better than it has been for some time past.

On Friday evening Mr. Joseph Pemberton, of the Mount, Hinderton, Cheshire, gave a rearing supper to the employés of Mr. Wm. Fleming, contractor, of Neston, who has just completed very extensive alterations to the Mount. The dinner took place at the Shrewsbury Arms Hotel, at Hinderton, where 60 of the employés were present, Mr. Pemberton occupying the chair. There were also present Mr. W. A. Thomas, the architect, and Mr. Wm. Fleming, the builder.

The Sheffield City Council have decided to buy the undertaking of the Sheffield Electric Light Company.

## Our Office Table.

THE magnificent collection of miniatures formed during many years by Dr. Lunsden Propert, the first authority on the subject in England, has been purchased by the Fine Art Society, and will be exhibited by them at their Bond-street Galleries very shortly. The collection has been formed with the dual object of comprising not only a complete historical survey of the School of Miniatures from Holbein downwards, but of the celebrities whom they painted. From Holbein's celebrated portrait of Jane Seymour onwards, we have every one of the Tudor and Stuart Royalties, as well as portraits of Cromwell, Milton, Drake, Raleigh, Evelyn, Nell Gwynne, and the beauties of the Stuart and Georgian Courts. There are also three of Shakespeare, two being known and engraved as the Somerville and Auriol portraits. Of specimens of the celebrated and rare early miniaturists there are no less than nine Hilliards, eleven Olivers, and fifteen Coopers with undoubted pedigrees. Nor is the collection confined to the 17th and 18th century English masters, for it is rich in enamels by the Petitots and the foreign schools of miniaturists.

For some time past the Scottish Board of Trustees for Manufactures have been engaged in maturing a scheme for the decoration of the Scottish National Portrait Gallery at Edinburgh, for which funds were placed at their disposal more than a year ago. Several additional statues for the niches in the façade were commissioned, and those of Dunbar, David Hume, and James Watt are now in the hands of the sculptors. An anonymous friend has just handed to the Board a sum of £300 for a statue of Henry Raeburn, the portrait painter, the execution of which has been intrusted to Mr. Pittendrigh Macgillivray, A.R.S.A. The architect, Dr. Rowand Anderson, has been occupied in arranging for the ornamentation of the capitals of the pillars in the central hall, some of them after designs of selected pupils in the School of Applied Art, and these are now being proceeded with. The lighting of the hall having been found somewhat defective, a wall which separated three small rooms in front of the building from the ambulatory is being taken down and open archways substituted. For the mural decoration of the central hall and ambulatory with this addition, the Board have decided upon a scheme illustrative of Scottish history, the commission for which they have intrusted to Mr. William Hole, R.S.A.; the fee to be paid him for the work being 3,000 guineas, on the understanding that the work shall, if possible, be completed under the superintendence of the Board in the course of three years from this time, Mr. Hole being entitled to employ such competent assistants as he may find necessary to insure the work being carried on with efficiency and despatch. Mr. Hole will start next week for Italy to study the decorative art of the Italian masters, especially in the towns of North Italy, returning through France, where he will also be able to examine more recent works of a like character.

THE Highways Committee of the Town Council of Douglas, Isle of Man, are taking steps to amend the building by-laws. The proposed amendments require that lock-up shops shall have 100 superficial feet of air-space at the rear, and, if attached to a domestic building, the air-space required in the case of a domestic building will be required. Other amendments as to air-space are also recommended, providing that the width of open space at the side of any building shall not be less than 6ft. between walls for new buildings in streets already existing. For buildings in estates not already approved the width shall not be less than 7ft. 6in. It is provided, however, that whenever, on the rebuilding of houses within the town, these dimensions cannot strictly be adhered to without considerable sacrifice of property, they may be modified by the corporation. The proposed amendments will be considered and discussed at a special meeting to be convened in the course of a week or two.

SIR JOHN PENDER's collection of pictures, which Messrs. Christie are to sell in a few weeks' time, comprises about 400 lots, nearly all of which are by modern artists. The collection includes Sir A. W. Callcott's "An Italian Landscape," W. Collins's "Early Morning on the Sussex Coast," A. Elmore's "Marie Antoinette in the Prison of the Temple," Keeley Halswelle's



"Canterbury distant view," two by Landseer, "The Lost Sheep" and "An Event in the Forest"; Lord Leighton's "Phoebe," Sir J. E. Millais's "The Prescribed Royalist," W. J. Müller's "An Encampment in the Desert," two by J. Philip, "La Gloria, a Spanish Wake" and "The Gipsy's Toilet"; Sir Joshua Reynolds' portrait of Princess Sobieski, David Roberts's "The Chapel in the Church of Dixmunde, West Flanders," C. Stanfield's "The Mew Stone, Plymouth Sound," Alma Tadema's "The Education of the Children of Clovis and Clotilde"; three by Turner, "Mercury and Herse," "Wreckers, Coast of Northumberland," and "The State Procession bearing Giovanni Bellini's Pictures to the Church of the Redeemer, Venice"; T. Webster's "Sunday Evening," Sir D. Wilkie's "The Cotter's Saturday Night," Rosa Bonheur's "Mountainous Landscape, with Cattle," and C. Troyon's "The Height of Suresnes."

The workmen engaged on the reconstruction of the Broomielaw Bridge at Glasgow have come upon the foundation-stone of the old Broomielaw Bridge (built from designs by Telford), which was laid with full Masonic honours by the then Lord Provost, the Hon. James Ewing, on Tuesday, September 3, 1833. The stone, which is of fine granite, is as clean as though it were fresh from the hands of the cutter. Intimation of the discovery was sent to Messrs. Blyth, Cunningham, and Westland, Edinburgh, the engineers of the new bridge. They ordered the stone to be lifted, and on Tuesday last the bottles, taken out of the cavity, were formally opened at the City Chambers, Glasgow, by Lord Provost Richmond, in the presence of the members of the Bridges Committee of the Corporation and other gentlemen interested. The opening took place in the Satinwood Salon, where the bottles were displayed in a glass-covered case. In the one were coins, &c., and in the other appropriate documents of the time. The coins were chiefly of the first and second decades of the present century, though there was a copper twopenny piece of date 1797, and included a guinea gold piece, a silver twopenny piece, a silver penny, &c.; whilst the chief contents of the other jar were copies of the ten Glasgow newspapers of the time—lilliputian sheets costing 7d. apiece; a copy of "Oliver and Boyd" of the time, paper-covered; a Glasgow Directory of the year, a diminutive volume as compared with the present one, and in marble-paper covers; a copy of the Act of Parliament authorising the construction of the bridge, and other documents. All the documents were in excellent preservation, though, of course, somewhat damp and musty, while the coins were merely a little dulled in lustre. The bottle containing the "records" was so tightly packed that there was a question as to whether it would not have to be broken to liberate its contents. After the jars had been opened and the mementa disclosed, the party adjourned to luncheon. In proposing the "Bridges-Committee," Lord Provost Richmond said that Telford's bridge, which they were now reconstructing, had been in use since 1833. It was one of the most beautiful bridges in the country; but beautiful and good as it was, it gradually grew unfit to cope with the demands of an ever-growing commercial city like Glasgow, and it had to go. Mr. John Macfarlane, convener of the Bridges Committee, in responding, said that about half of the work in connection with the new bridge was already done, and that the most difficult half—the half under water. The piers were all sunk, and they expected that by next year a very great difference would be made in the appearance of the bridge.

The foundation-stone of a new infants' department in connection with the Hasbury National Schools was laid on Thursday in last week by the Bishop of Coventry. The estimated cost of the department is about £900, and it will be capable of accommodating 260 children.

A monument of wood has just been erected over the grave in which the casket containing the ashes of Mr. George Du Maurier was deposited in the Hampstead Churchyard, after the cremation of his body at Woking. The corners of the structure, at the head and foot of the grave, are carved uprights in the form of ancient Celtic crosses. From the uprights runs a centrepiece on which appears an inscription, giving Du Maurier's name, date of birth and death, and concluding with the following lines from "Tribly":—"A little trust that when we die We reap our sowing; and so—Good-bye."

## MEETINGS FOR THE ENSUING WEEK.

TO-MORROW (SATURDAY).—Edinburgh Architectural Association. Visit to Bavelaw Castle and Lennox Tower. Train from Caledonian Station at 2.7 p.m.  
Northern Architectural Association. Visit to Wm. Harrison and Co.'s Works at Blaydon. Train from Newcastle. 3.30 p.m.  
MONDAY.—Surveyors' Institution. "Local Authorities and the Building Laws," by W. H. Payne, L.C.C. 8 p.m.  
TUESDAY.—Auctioneers' Institute. "The Practical Application of the Principles and Law of Dilapidations," by Henry Bushell, F.S.I., Professor of Surveying, Birkbeck Institute. 8 p.m.  
Society of Arts. "Delft Ware," by Dr. J. W. L. Glaisher, F.R.S. 8 p.m.  
WEDNESDAY.—Society of Arts. "Asbestos," by Robert H. Jones. 8 p.m.  
FRIDAY.—Architectural Association. "The Classic Cornice," by Hugh Stannus, F.R.I.B.A. 7.30 p.m.

## CHIPS.

The new pipe-organ which has been built in Hawick parish church was opened on the 15th inst. The organ, which was built by Messrs. Forster and Andrews, Hull, has cost £955, and this completes the church improvement scheme inaugurated about three years ago, including the reseating and decorating of the church, the erection of an organ-chamber, and the introduction of an organ at a total cost of over £2,200.

A Tudor Exhibition is to be held at the City Art Gallery, Manchester. The private view takes place on Wednesday next, and the exhibition will be opened until August 2.

The Snowdon Mountain Valley Railway, which was opened on the Easter Monday of last year, but closed owing to an unfortunate accident which occurred on the first day, was reopened on Monday after extensive alterations and repairs. Five trains went up during the day to Clogwyn, the scene of last year's accident, beyond which they were not run. During the intervening months, English and Swiss engineers have been at work, Sir Benjamin Baker acting in a consultative capacity. The permanent way has been greatly improved, the conclusion having been arrived at that a good deal of the stuff used at first in the embankments was too soft and yielding, and £9,000 has been spent in laying down a "safety guard" along the whole line. This consists of a T-shaped steel rail, there being powerful sets of grips underneath each carriage and engine; it is an invention by Sir Douglas Fox, and has already been adopted on several Swiss railways.

On Saturday evening the dedication and opening of a new organ in St. Vincent Episcopal Church, Edinburgh, took place. The organ, which was formerly a one-manual instrument, has been converted into a two-manual and pedal organ, with six stops on the great organ, four swell pedal bourdons, and three couplers. The specification has been drawn up by Mr. T. H. Collinson, under whose supervision the work has been carried out by Messrs. Blackett and Howden, Newcastle-on-Tyne.

The roof of a church at Brousse, in the Department of Tarn, recently collapsed during the celebration of Mass. Eight persons were killed, and some thirty others were injured.

The electric-light works erected by the Harrogate Corporation about a mile outside the town were opened on Wednesday week. The works and installation have cost £25,000.

Mr. R. Walton, an inspector under the Local Government Board, held an inquiry at the Eccles Town Hall on the 15th inst. with reference to an application of the Town Council to borrow £5,159 for works of sewerage, £900 for the construction of underground conveniences at Eccles and Barton, £739 for repairing Barton-lane—the main thoroughfare to the Ship Canal—£275 for the laying-out of a bowling-green on the recreation ground, and £217 for works of private street improvement in Vernon-avenue. The borough surveyor, Mr. A. C. Turby, explained the plans and proposals.

The name of Alexander Henley Attwater, of Newlyn House, Aldgate High-street, E.C., and Brighton, architect and surveyor, appears in Friday's list of adjudications in bankruptcy.

At the last meeting of the Burgh Police Commissioners of St. Andrews, a report by Mr. Crook, C.E., Manchester, on a new outfall drainage scheme for the western portion of the city, in substitution for the present outfall, was read. He recommended the Commissioners to carry the drain out of the river Eden, distant about two miles from St. Andrews. This would get rid once and for ever of all complaints. The Burgh surveyor was instructed to make experiments at the point where the proposed outfall would issue into the river, so as to determine the destination of the sewage before coming to any conclusion to proceed with the proposed scheme.

## Trade News.

### WAGES MOVEMENTS.

ARBROUTH.—The wages of plumbers in Arbroath have been increased 3d. per hour, the rate now being 7½d.

DUDLEY.—The carpenters are still on strike, and there is at present little prospect of a settlement. The men are getting 7½d. an hour, and are striking for 8d. The masters are willing to give 7½d., but hold out against the other farthing. Building operations are rather extensive in Dudley just now. The men are being well supported by their union.

EDINBURGH.—A mass meeting of the joiners of Edinburgh was held on the evening of Good Friday in the Oddfellows' Hall, Forrest-road, for the purpose of hearing the report of the committee instructed on the Wednesday evening to obtain the signature of the representatives of the master joiners to the agreement increasing the wages of operatives to 9d. per hour, and fixing the new municipal boundary, with Portobello struck out, as that which should now be recognised. The meeting was largely attended. Mr. William Gall, who occupied the chair, intimated amid applause that the employers' representatives had signed the agreement, and, claiming the result as a victory for trade unionism, he exhorted all non-union men to join the ranks of the trade unionists.

GALASHIELS.—The painters of Galashiels are at present agitating for a rise in their wages from 7½d. to 8d. per hour on a nine hours day, with time and a quarter for overtime after five o'clock. A meeting of the workmen and employers was held in King's Temperance Hotel, Galashiels, on Wednesday evening in last week, when the situation was fully considered. The masters ultimately decided to confer with the Border Counties Master Painters' Association on the subject.

HULL.—The Master Builders' Association have decided almost unanimously to advance the wages of their joiners 3d. per hour, thus making the standard rate 8½d. per hour. The joiners trade has been very brisk for a considerable time, and there is every prospect of its continuing so.

KIRKCALDY.—The floorcloth and linoleum printers have received an intimation that those engaged on piecework will receive an increase of 5 per cent., to take effect on May 1.

NORTH WALES SLATE QUARRIES.—Notices have been posted at the Penlon Slate Works, the largest in Bangor, stating that, through want of material, owing to the strike at Lord Penrhyn's quarries, the works will be immediately closed. At all the slate works in the Bangor and Menai Bridge district work is now suspended.

SCARBOROUGH.—The strike of plumbers for an extra penny per hour still continues, and work in that trade has been at a standstill now for over a week.

THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.—The annual report of this society, just issued, shows that there has been a net gain of 17 branches, making a total of 709 at the close of the year. The number of members admitted was 8,635, and, after allowing for deaths and exclusions, a gain appears of 4,476, making the present membership over 50,000. The receipts from those in employment amounted to £126,527 10s. 10½d., and disbursements to £99,993 16s. 1d., thereby enabling the society to increase its cash balance from £79,422 10s. 7d. to £105,956 5s. 4½d., the largest amount accumulated during any year of the society's history. A careful valuation of the society's property shows the value of its assets is £112,962, or £2 6s. 5½d. per member. In unemployed benefit the society has expended £16,209 17s. 11d., or 7s. 3½d. per member, which is the lowest amount required for this purpose since 1890, being £22,436 less than the previous year, and a lower average than any experienced since 1877. Replacing tools lost by fire, water, and theft cost £3,634 0s. 9d., or 1s. 7½d. per member. Sick benefit £24,915 19s. 1d., or 11s. 2½d. per member. Funeral benefit for members and their wives £1,503 4s., or 2s. 0½d. per member, as against £4,201 the previous year. Accident benefit £2,240, or 1s. per member over ordinary members, and £50 paid to an injured member of the trade section, making an actual outlay of £2,290. Superannuation benefit £12,211 14s. 3½d., or an average of 5s. 6d. per member over those entitled to claim it. This amount, when compared with the previous year, shows an increased expenditure of £1,246. Trade privileges £11,884 15s. 1¾d., or 5s. 4d. per member, as against £6,607 in 1895, an increase of £5,277.

A work of restoration and repair is in progress at Byland Abbey. Already the south side buttresses have been footed and replaced, and also the window-sills, and it is the intention to scaffold the west end and restore the pinnacle. Mr. John C. Cornforth has charge of the restoration.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### DRAWING DETAILS.

ATTENTION to detail is one of the distinguishing points which separate the old from the modern architect's work. Our ancestors, whose buildings still create admiration and find imitators, did not know the official meaning that is now attached to drawings and designs. The working drawings, at least, were all made on the building, and in direct contact with materials and craftsmen. Now they are documents prepared in an office, often miles away from the building. They, moreover, represent the gradual withdrawal of the architect from the scene of the building operations with which he was originally so intimately connected. "Drawings and specifications" have superseded the actual residential work on the building. The phrase implies a delegated authority—the instruments only by which a building can be carried into execution—and by no means represents the mind which actually conceives. In these days it is well not to attach more meaning to the instrument than to the actual performance, for a great many get credit for more than they are entitled to. The nominal architect obtains from the "ghost" the credit of the design as a whole, and the man who puts life and spirit into a piece of sculpture gets little praise compared with the commercial contractor who does the decorative work, and who measures his skill by the square foot or yard; and so it is all through the building and other vocations as well. The perfunctory professional man who has his brass plate on the door, who rents offices and employs clerks or assistants, is the man who necessarily gets all the credit which is often due to someone else. The one who dispenses medicine or administers law often gets in the same way more honour than he who has prescribed or has really made the law. Similarly the drawings and specifications represent the instrumental process by which the one thought of the architect is transmitted to the workman; and it has come about, rightly or wrongly, that the person who provides these things is the chief individual. He may be only an intermediary between the two things, the idea or design and the actual work, and it is in this fact that the estrangement of authorship from real work has taken place. The individual who provides plans and specifications at 5 per cent. (including general supervision), is he, in short, who is the recognised architect. Under our present system of architectural practice, these are also utterly essential, but the mischief is they are often made the substitute of what they only represent. Drawings and specifications are too often made the end rather than the means employed by the architect in carrying out his design. That is to say, the drawing of a building is looked upon as the architect's particular function, and that if he acquits himself creditably of this performance, he has really accomplished his part. A great many in the profession act on this idea, that when they have finished the contract drawings and specification their work is practically at an end. No doubt it is the commercial view of the architect's profession; it is convenient, for it saves responsibility, expedites his labour, for it can all be done at the office, and be handed over to clerks. A certain kind of perfunctoriness has grown out of this view. Men practise architecture as they would carry on businesses like estate agency or that of dispensing, but very unlike the manner in which the archi-

itects of the Mediæval or Renaissance eras carried on their work.

Let us consider for a moment working drawings. How many in the profession really make them studies of the work? The draughtsman, to whom they are left, draws to a large scale or full size a particular part, say a section of a wall showing the stonework or the construction of floors and roof; or it may be a truss, with details of each member; or a vault, showing how the ribs are arranged, the position of ribs at springing, the contour of the ribs, the bed and joint moulds, springers, and so on. Whichever it is, the drawing is executed with some degree of neatness and finish—in many cases all thrown away, if there should be something wrong with a dimension or a level. Accuracy can only be obtained by taking minute observations of the actual work in progress, or by a practical knowledge of what is wanted, whereas the average detail drawing is often a mere enlargement from the small-scale drawings. The old builders' methods were different; these, according to what we know of them, were often rough and diagrammatic, or sketches on a board made on the building, and, as Mr. T. G. Jackson said the other day, were slight and most conventional. Details in Wren's time were often left to the workmen, who were competent to carry out the ideas of the architect. Schools of masons, joiners, carpenters, smiths existed, and these followed traditions of their own. To them the general idea or sketch of the mastermind was intrusted to complete, and the details, and often the ornament, were left to the working craftsman. The same gentleman says the architect gave them the size of the door, the scale and amount of ornament he wished to use, and the workman had sufficient skill to fill up the details of the sketch and to realise the architect's intention. But imagine such a course in these days! Can we think of a modern joiner working from a rough sketch without a shudder for the result? Could any architect in these days trust the average mason or joiner with the profile of a moulding or the manner of completing a detail? Many architects, no doubt, would gladly dispense with providing working drawings—it would save them much labour and thought—if they could only be sure of the workman's skill and taste; many more leave all the details to the contractor, to save themselves trouble, no doubt, but seriously at the cost of the design. Others, still, employ, as we are told, "ghosts," who take very little interest in what is not their own. How can it be expected? No; the modern architect cannot dispense with drawings of details; those for whose guidance they are made are far from being the craftsmen of the ages of which we have referred. Moreover, the typical working drawing is too often more an example of draughtsmanship and tinting than of skill and thought—office labour only. From these causes—inadequate art-skill on the part of the workman, and a perfunctory providing of drawings, which are often imperfect and impracticable, conceived in the office instead of drawn in the building or in touch with it—we can explain how it is so many buildings give dissatisfaction to their designers. On the details of a building more than on the general design its merit depends; but this view is exactly the opposite to the practice of the nominal architect, who thinks he has performed his part if he has designed the building in the mass, and left all details to contractors and workmen. The results are obvious to all who look at most modern buildings generally lavish in their detail. Thoughtful design is everywhere absent. Where bold ornament or mouldings ought to be, there we see finical work that can hardly be seen; where stone or brick should be shaped to throw off water or to withstand rough usage, as in sills and

plinths, there are mouldings that retain moisture and are easily chipped. Other inconsistencies of design are met with where the workman has essayed to correct or modify a working drawing that was not practicable as drawn. Working drawings are often made without any practical knowledge of the manner the actual work is done. We have seen young architects and draughtsmen labour over a drawing of a stone cornice or mullioned window who have not any idea of those points which the practical mason would look to. Can this member be cut or shaped in such a way without waste of material? Are the mouldings designed that they may save unnecessary sinking? These and like questions would occur to the practical mason. Or, is the design I am making suitable to the material—stone or terracotta or iron? The designer is sometimes tempted to alter a moulding or a piece of ironwork without knowing really whether his alteration is not likely to lead to trouble in execution, and to turn a simple design into a difficult one for the workman. And it is the same with other trades. The modern office working drawing is often answerable for much extra labour; it is made without the help or suggestion of the working craftsman, from drawings or books of details, and the workman has grown to regard it as something that cannot be made to square with the tradition of his craft. The office and the workshop ways of doing things are not the same; each has its own traditional method, the architect may be quite unaware of the way the material is handled, or the thing made, the working artist is equally bound to his own habits, and cannot see any other way of doing a certain thing than that which he has been taught to do. Between them the designer's intention is frustrated, and the only way the working drawing will be recognised will be when it is once more made the instrument of conveying the ideas of the architect to the actual work.

### PICTURES AT THE ROYAL ACADEMY.

DEPARTURES this year from the conventional standard are few. The majority of the contributors have confined themselves to popular methods of representation and to familiar subjects, and those who desire to see what the more advanced and idealist school have produced must go to the New Gallery and elsewhere. Landscape, figure-subjects, and *genre* are very largely represented on the walls, but we notice few great classical compositions in either branch. Only a few pictures detain us in the first gallery. Isabel C. Pyke-Nott's rather gruesome subject (3), "I curled and combed his comely head; he looked so grand when he was dead," has power, and the handling is forcible. A very able work, marked by much originality and power of conception, is Arthur Hacker's "And there was a Great Cry in Egypt"—the smiting of the firstborn in Egypt. The painter depicts night; the winged angel of death is wafting by the houses of the Egyptians, and the grace and dignity of the robed figure lend a mystical power to the theme. Next it, Peter Graham paints one of his powerful Highland scenes—a rocky moorland, with oxen crossing a stream. The hills are wrapped in mist. John Finnie's "Tragic Sunset," a landscape reddened by the glow of a setting sun, is a strong piece of colour. David Murray's "Hampstead from the Viaduct" (30) is hardly up to this painter's mark. Passing on, we come to a subject of classical interest, "Calypso's Isle" (39), where the daughter of Atlas is represented seated on a ledge facing a dark blue sea girt by formidable rocks and holding a mirror in her hand. The strong, dark colour of the sea contrasts vividly with the undraped figure



of Calypso. Portraiture occupies a large space, as usual, in this and other galleries. W. Q. Orchardson has an excellent portrait of the Bishop of St. Asaph; and Briton Rivière a presentation of Lady Wantage and her Egyptian donkey—a presentation portrait.

Passing on to Gallery II., we may first notice one of the two works contributed by L. Alma-Tadema, entitled "Watching" (173). This represents a dainty Roman interior, with a glimpse of a blue sea, seen through a curtained opening. A beautiful maiden, clad in delicate draperies of peach-like hue, sits on a handsome couch. She wears a necklace of pearls and amber; on the wall hangs a circular mirror. Her fair, well-modelled face is turned away from the blue sea as a ship passes—

Once only turned, but in that while  
The ship of her joy went by.

Whether the painter intended to illustrate the poem which is quoted, or a moral of the fleeting nature of human love and joy, we cannot say; we admire chiefly the consummate technique, the architectural detail, the draperies, textures, and delicate subtle colour and reflected light. It is not perhaps equal to others we have seen here, but it has still the indefinable charm of composition, subtle line, and refined colour. Laura Alma-Tadema (108) in "A Pledge" shows one of her delightful interiors, lighted through a mullioned casement. At a small table a fair-haired girl sits, while her dark suitor is drinking as a pledge of his troth. His and her eyes meet. The picture has a Millet-like clearness and transparency, with all the charm of colour and delicacy of tone and detail of the painter's own. Frank Dicksee's tall canvas, "Dawn," which occupies the place of honour, on which we have seen pictures by the late Lord Leighton, J. W. Waterhouse, and others, is a very beautiful allegory. The figure representing Dawn is a maiden lifting up her light, roseate drapery, which she is throwing off; while, below her, the shadows of night are typified in a woman clad in dark grey, who is descending on the orb of the earth in a dark cloud and mist. The composition is graceful and decorative in its scheme of colour. Alfred Parsons has a large, wild, rocky scene, "The Star that Bids the Shepherd Fold," of much power and grandeur. J. W. North's "Old Abbey Fishponds" (152) is painted with all the softness and subtle charm of this landscape painter. It is a wooded vale bathed in a spring atmosphere. One of the most attractive pictures in this gallery is "Love's Baubles" (164), by Byam Shaw. It represents a gorgeous procession of maidens, richly attired and coiffured, crossing a daisy-decked meadow. They are led by a girl carrying flowers, and followed by a damsel clothed in an embroidered garment. As a fantasy and a scheme of colour it is undoubtedly clever. The president, Sir E. J. Poynter, sends a graceful study, "Phyllis" (188), one of two subjects. According to tradition, Phyllis was the daughter of Lycurgus, King of Thrace. Her lover proved faithless, and she is said to have been changed into an almond-tree. The president represents a pretty girl clad in light amber drapery, with mirror in hand, arranging a wreath of the leaves round her head.

One of the most successful pictures in Gallery III. is C. Napier Hemy's "Pilchards" (204), a wonderful piece of sea-painting. The fishermen in the boats are busily engaged in netting the shoal of fish. Nothing can excel the brilliancy and silvery tone of the fish, the colour of the sea, and the realistic way in which the boats and their occupants are painted by this master of "toilers of the sea." The movement of the waves and the freshness of the sea are unsurpassed. Ernest Crofts, R.A. elect, has not lost anything of his deftness in the representation of historic battle-grounds. "The Attack on the Gatehouse of the

Château of Hougoumont, Waterloo" (196) is dexterously handled, full of vigour and animation. The large, centre picture of Frederick Goodall, "The Ploughman and the Shepherdess: Time of Evening Prayer," forms a good centre subject, and the painter quotes Byron's verse:

Man's love is of man's life a thing apart,  
'Tis woman's whole existence.

In the midst of an Eastern plain, with hills in the distance, a ploughman stands against the bright evening sky illumined by a red sunset; on the left we see oxen ploughing, while in the immediate foreground a flock of sheep are coming down to drink the water of a pool. On the bank sits a shepherdess clad in loose garments. What the scene has to do with Byron's lines is not very clear. The warm sunset light illumining the landscape, the sheep descending to the pool, and the solitary figure standing against the sky make a bold composition, if it has nothing else to recommend it. An allegorical composition is sent by Val. C. Prinsep (220), called "At the first Touch of Winter Summer Fades Away." "Summer" is typified by a young fair maiden in light rose-coloured draperies, holding in her hand roses, while "Winter," in sable garments is touching her—the blossoms drop from the hand of "Summer." A pleasing harmony in green, gold, and red is Edward S. Harper's "A Reverie" (222), a girl in green velvet, playing the piano. There is some decorative value in the composition and colour of this subject, the painted panels of the piano forming a background to the girl's head and green dress. The principal picture by W. Q. Orchardson is entitled "Rivalry" (227)—a drawing-room furnished and decorated in the 18th-century or Louis Seize style. Three gallants, somewhat *blasé* in countenance, sit before a young lady in elegant attire, who reposes on a couch but does not appear to be much fascinated by any one of them. The room opens into another room where other guests are seen. The drawing and perspective are admirable; there is just a suggestion of the amber tones which we are accustomed to see in Mr. Orchardson's work. The tones here are rather of ivory and red, full of quiet harmony. There is, as usual, a stately repose in the treatment of the interior, its decorations, and occupants, which remind us of other similar pictures. We, of course, miss the classical charm and polished grace of the work of the late President. In its place of honour is a large landscape by H. W. B. Davis, "Flow'ry May" (240), a grand, hilly landscape, in the midst of which is a large tree of Mayblossom, with cows browsing beneath its branches and sheep feeding. So great a master of this phase of landscape has hardly painted more realistic blossom; the gleams of sunshine have brightened the bloom in parts, other parts of the foliage are in shade. Few painters in the traditional school have succeeded so well as Mr. Davis in delineating the beauty of spring blossom. Above this picture is a large Scriptural subject, "Peace be to you" (239), where our Saviour is shown in the upper room appearing to His Disciples, recorded in St. John xx. 19. Jesus is standing in the midst, and speaking the words "Peace be to you." His figure is illumined by the lamplight effect, which brings the other figures into prominence. The Disciples are amazed; some appear to shrink back from the apparition, one throws himself on the floor. There will be different estimates of the work of John H. F. Bacon, and we think such a subject is more happily handled by those who are not so restricted to the realistic school of painting. William Logsdail's very beautiful rendering of "The Bronze Horses of St. Mark's, Venice" (252) is worthy of attention. The architectural drawing and detail, the sculptured marble of capitals and

bronze are no less excellent than the charming colour and perspective. Colin Hunter's "A Pool in the Wood, Helmsdale" (253), is a fine landscape, admirable in colour. B. W. Leader's "The Breezy Morn" (268) is probably one of the best of the four he exhibits. It is a rugged common clad by a few stray firs and a pool of water in the foreground. The early morning light and clear atmosphere seem to impart a freshness and beauty to the landscape, the foreground, and the still water. In the next gallery, "Fast Falls the Eventide" (398), we see the same painter in one of his earlier moods—a flat country with scattered trees and a small, low-towered church on one side; a rough cart-road, its ruts filled with water, which reflect the evening sky, crosses the landscape. All is truthful, and vivid; the light and clear evening sky is reflected on the ground, and the trees are strongly contrasted against the sky. Inimitable in their handling and truthfulness, these pictures yet lack something of the other school of landscapists. But we go back to Gallery III. Robert W. Macbeth has a large picture, "The End of a Good Day" (258), a party of huntsmen and their dogs before an old manor house, very spirited and clever in the drawing of the hounds, and the features of the old house, rich tones pervading the work. Philip H. Calderon's "The Answer" (264)—a figure of a girl at a writing-table in white dress and cap, trying to think of what to say in a letter—has a note of refinement in the colour; but why so large?

George H. Boughton sends a large and ambitious picture, "After Midnight Mass" (278). The scene represents a part of a large and handsome church with painted windows, through which the interior light appears. Two ladies of high degree, richly attired, with high coiffures and jewelled shoes, are crossing the road to their carriage by the aid of torch-bearers. A group of other folk stand round the portal and appear in the distance. Mr. Boughton has brought his historical and scholarly attention to costume and details to bear on the work. Allan Stewart's "The Distribution of the Royal Maundy" is also cleverly handled, and we can only just glance at the President's second subject, "The Message," showing a palatial building of Roman architecture. Two young maidens, on a sort of landing-stage, are handing a packet of letters to a man in a ship, the masts of which only are seen. There is much technical skill in the architectural details—the bases of the marble columns, the perspective of the edifice, and the draperies. J. W. Waterhouse's "Hylas and the Nymphs" (307) is the principal work of this master. The myth is cleverly handled, especially the naiads, and there is a subtle charm in the colour.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—I.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THE predominating feature in the Architectural room at the Royal Academy this year undoubtedly consists in the unusual number of drawings devoted to the illustration of new churches. Good country and town houses are conspicuous by their almost entire absence—at any rate those of the mansion class, while perhaps, on the whole, there are more of those inopportune nonentities which puzzle the visitor, causing no little wonder, among architects at any rate, as to why such poor drawings and really bad designs are thus inexplicably chosen. Among the best examples of modern ecclesiastical design the noble memorial church of St. George, recently completed at Stockport, takes a leading place, demanding unstinted praise. For this reason we have to-day devoted the whole of our lithographic plates to its illustration, considering, as we do, that the designer of so masterly a work as this merits recognition at the hands of the Royal



Academy of Arts, and we all know that Mr. Hubert J. Austin, its author, has for many years been producing churches which will bear comparison with any like works of their class erected during the sixty years' reign of Queen Victoria. St. George's, Stockport, exhibited by Messrs. Austin and Paley, holds its own with any Gothic church of its size built in modern times. In saying this we are not unmindful of the conspicuous successes of the past fifty years achieved by such church builders as Welby Pugin, Sir Gilbert Scott, G. E. Street, and Edward G. Paley, or by such living masters in ecclesiastical art as Messrs. J. L. Pearson, G. F. Bodley, J. F. Bentley, Somers Clarke, or James Brooks. The drawings, too, which here represent the building are admirable, copiously illustrating its detail, though we much regret the absence of a plan. There remains little to add in this place to the rather long description, which we have printed on another page. The original drawings deservedly hold two posts of honour at either end of the gallery. The design itself is harmonious and complete, broadly handled, with an intimate knowledge of style, of which it is essentially a 19th-century digest, and in no truthful sense can be regarded as a mere Gothic Revival church, exhibiting only the dry bones of Mediæval architecture. On the contrary, the work is gratifyingly devoid of that incoherent eclecticism just now reckoned so smart and very up-to-date by some of our younger contemporaries, who ignorantly profess to slight such thorough and capable work as this.

Mr. John O. Scott sends a handsome church, St. Martin, Harrogate, with a western tower and a lofty clerestory, filled by traceried windows of a more orthodox type. St. Peter's Church, Hornsey, the sole exhibit of Mr. James Brooks, is a work of a somewhat different manner, with fenestration fashioned more after the Perpendicular mode, the west window as well as those in the transepts being deeply recessed. Mr. Brooks feeling, apparently, the continued absence of his tower at St. Mary's, Hornsey, and the loss entirely of the grandly-treated spire which he designed for St. John's, Holland-road, seems to have determined that St. Peter's should not suffer in this respect, and so he has devised two squat turret-like towers, capped by dwarf conical spirelets flanking the west front. The western porches—and, indeed, the whole composition of this end of the building—seem wanting in that degree of breadth usually conspicuous in Mr. Brooks's designs. Following the order of the catalogue for lack of a more definite lead, we will briefly refer to some of the more noticeable churches displayed on the walls. The first of these in the list is Elland Church, Yorkshire, by Mr. G. H. Fellowes Prynne, whose work here is a trifle too busy, and thus is lacking in boldness and breadth with his numberless breaks, set-offs, and archings. Still the design is clever, and in a way original. Mr. E. M. Bruce-Vaughan, of Cardiff, hardly secures this distinction in his Seughenydd Church and mission-room, a well-grouped block with a dignified tower. Mr. Temple Moore's church, Barnsley, shown by a hard, washed perspective, recalls St. Agnes, Kennington, in the style of treatment adopted, with its traceried windows without hoods, and the unqualified severity of its exterior. The square turret at the angle is ungainly; but on plan the morning-chapel is skilfully contrived to accommodate the irregularity of the site, and a western gallery marks the present-day tendency to revert to choir tribunes for elaborated orchestral services, such as are now familiar at St. Michael's, Brighton, and other "advanced" churches. Mr. W. D. Caröe, who has no fewer than six exhibits in the Gallery, sends St. Stephen's, Nottingham, among his churches. It is marked on the west front by a deeply-recessed large traceried window, cut in two by a biggish

buttress, and the altar is located, tomb-like, in a low arched recess at the east end, where there is no eastern window. For a country church on an open site this arrangement is peculiar, and internally no reason seems discoverable for it. The effect is not good, even if it be novel. Mr. Fred. A. Walters shows a Norman-like church for East Grinstead by a bald grey drawing hung too near the eye. Above it, out of sight, there are one or two very delicately-tinted views worthy of a closer inspection. As it is, they serve only to balance the sky-line. The proposed nave for Yiewsley Church furnishes Mr. C. A. Nicholson with a good subject for a capital water colour, but it is necessary to go on one's knees to examine it (1767). The heavily-buttressed, squat tower is not so happy as the broadly-handled gabled end of the building, which is distinctly pretty. Mr. Temple Moore's little sketches of St. Magnus, Bessingby, are too near the cornice to be seen; but Mr. Huron A. Matear's design for Holy Trinity Church, Southport, is very much in evidence. The west window is recessed in the approved mode *à la* Sedding; but in addition, in this case, a variation is obtained by a central disengaged mullion running up to divide the face of the main opening into two by means of a traceried head. The low narthex portal below is in contrast with the dominating vertical lines of the façade, which is flanked by bold turrets. The tower is bold and somewhat effective. Mr. E. W. Mountford is about to build a new church in Southfields, Wandsworth (1795); but we cannot say that the design rises above the ordinary in interest, with its recessed and buttressed west window varied this time by a gallery external to the west wall across the gable. The transept and porch are really very nice, and hardly seem to belong to the rest of the composition. St. Alban's, Blackburn, must be the last church to be mentioned in our list to-day, or we shall leave no room to notice in a general terms the other leading items in the exhibition. Mr. Edward Goldie is the author of this building, an Early English church with a wide nave and very narrow aisles—mere gangways fitted with confessionals, seemingly. The interior looks spacious enough.

The members of the Royal Academy are not strongly represented this year. Sir Arthur Blomfield and Mr. Bodley do not appear at all. Mr. Norman Shaw figures in the catalogue, conjointly with his old coadjutor, Mr. Francis Doyle, as the joint author of (1841) some new business premises at Liverpool, a replica in many ways of New Scotland-yard, a suitable adaptation skilfully managed, with variations dictated by altered purposes and a different site. As consulting architect in this case, Mr. Shaw has undoubtedly impressed his masterly influence upon the perfecting of this building, which holds the chief place of honour in the Architectural gallery, adding much, too, to its interest. Mr. Alfred Waterhouse contributes but one drawing—a telling water-colour of the Surveyors' Institution in Great George-street, and a fitting neighbour to Mr. Charles Barry's Institute of Civil Engineers over the way. Its plan is cleverly contrived, and its architecture undoubtedly is well adapted to contemporary uses, distinguished as the façades are by Mr. Waterhouse's well-known and able style. Mr. J. L. Pearson, who, if we judge rightly, served his turn in hanging the architectural drawings this year, sends an exceedingly scholarly and capable design, delicately drawn in pencil, of the ornate Choir Screen for Bristol Cathedral—refined in detail and well proportioned undoubtedly; but in this isolated elevation it is hardly possible to estimate its relative connection in the building. Mr. T. G. Jackson, R.A. Elect, only has one exhibit in this room, though in another he shows two book-plate designs. This one illustrates the new

Boarding Houses at Westminster School, in stock brick with red dressings somewhat after what Mr. J. J. Stevenson called the "vernacular style." These working drawings hardly call for comment, and scarcely do Mr. Jackson justice as the typical work of a newly-chosen full member of the Academy. Messrs. Ernest George and Yeats are not up to their standard this year, or if we are wrong in this respect it is not our fault, as Mr. George's drawings are fairly skied. Mr. T. E. Colcutt has but one drawing—the new Loggia now building in the courtyard of the Savoy Hotel. Mr. Maurice B. Adams's drawing, also on the line, exhibits the Passmore Edwards Library for St. George's-in-the-East. Mr. Aston Webb shows additions to Paddockhurst, Sussex, and the French Protestant schools in Soho. The Passmore Edwards Settlement buildings, by Messrs. Smith and Brewer, are exhibited, and the Passmore Edwards Free Library and Central Technical Schools, Cornwall, too, find a place, from the plans of Mr. Silvanus Trevail. Mr. Reginald Blomfield sends the proposed St. Paul's schools for Girls, Hammersmith, and Mr. H. T. Hare is represented by his admirable design for the Presbyterian College at Cambridge. Mr. John Belcher recalls an old friend by the dining-room of Stowell Park, Gloucestershire. Mr. T. Garner sends Bishop Durnford's Tomb in Chichester Cathedral. To these and others we shall return.

#### THE NEW GALLERY.

COMPARATIVELY few great pictures are to be seen in the present summer exhibition of this gallery; on the whole, indeed, the collection is rather below than above the usual standard. Devotees to the cult which Sir Edward Burne-Jones has identified himself with will, of course, see much to admire in the large composition in the West Room entitled "The Pilgrim of Love," a subject illustrative of Swinburne's lines—

Love that is first and last of all things made,  
The light that moving has man's life for shade—

though hardly perhaps quite equal to former works. There is a sadness in the conception, marked, however, by much nobility and dignity. The old man, clad in dark grey drapery, bent almost double, scrambling through a thicket of brambles, and led by the hand of Love, who advances over rough, rocky ground with his arrow as a staff, is no doubt intended to symbolise the pilgrim on his thorny and difficult path, through the snares and temptations of life. Winged Love is leading the pilgrim on his way. Over his head is a cloud of small birds; he looks back at the weary pilgrim with a tender, saddened expression, as he plants his arrow and foot on another rocky obstacle in advance. The painter places his subject in one of those unconventional landscapes, while distant hills and a river form the background. Allegorical in meaning, the painter has thrown aside all conventions; the brambles twisted in many forms, and the pieces of rock on the path like masonry, the grey tones of the drapery, the darker steel-grey of the pilgrim emblematised the gloom and sadness. There is much that is mystical and symbolic in this work, though the draperies look too metallic. J. W. Waterhouse, R.A., sends a very refined work, in which the colour and contrast are the most charming qualities. The painter depicts a scene of Tennyson's poem, "Mariana in the South." Charm of colour has always been one of the strong points in Mr. Waterhouse's work, as in the beautiful picture of "Pandora." Like it, this picture is full of delicate feeling in composition and colour. The sad and lonely Mariana, with long hair, is looking into a circular mirror in a large room, paved with tessellated marble. L. Alma-Tadema, R.A., has two small-sized portraits (75 and 80), both of them very finished examples of his brush; but the picture by Mrs. Alma-



Tadema, "A Ring at the Door," a young lady in satin looking at her face in a wall-mirror in a large Dutch interior, is a more attractive subject. This lady painter gives us one of her most subtle and delicate interiors: the open casement and the cool sunlight are a harmony of grey tones, a note of blue introduced in the blue tiles of the skirted room. Dainty and delicate are the slight water-colour sketches of Mary L. Gow. "Mrs. Alma-Tadema" (64) is an idealised study of the lady artist on a rich cushioned sofa, and "L'Accord Parfait" (70) is another charming piece of delicate drawing—a lady and her child seated on a richly-upholstered couch, a perfect chord of harmony. The same artist, in the North Room, has a portrait of a lady and her son reposing on a blue cushioned seat, a cabinet and wall-painting as a background. These are all finished cabinet studies, drawn with subtle grace, with a mere suggestion of colours, looking like paintings on ivory. One of the cleverest subjects is Herbert J. Draper's "The Foam Sprite" (67) riding on a dolphin on dark, surging waves; the mirthful face of the sprite breathes the freshness of the sea in its eyes and lips; streaming seaweeds float from the head of the urchin, and there is grace and movement in every limb. The colour is admirable. As a figure subject H. H. La Thangue has been very felicitous and realistic in his "Autumn Morning" (155), a woman breaking across her knee a slender branch under the shade of trees, through the thin foliage of which the warm autumnal sunlight dapples the toiling figure and ground. Miss Flora Reid has two subjects—"Grannie's Déjeuner" is one of them, and "Preparing for the Promised Land" another—the first strong in colour, and the latter pathetic. "St. Cecilia," by J. M. Strudwick, is a charmingly-finished study of the saint at the organ, pre-Raphaelite-like in motive; and we must note the fine colour and conception in Archie Macgregor's "The Hour-Glass," a graceful idealisation or allegorical figure poised on a ball (95); Baron Arild Rosenkrantz's "The Secret," simply a girl's face, her hands holding a small casket; Henrietta Roe's "Azaleas" (134), a pleasing decoratively treated subject; C. E. Hallé's figure studies, "A Fountain" (143) and "Chagrins D'Amour" (146), smoothly painted; C. Napier Hemy's "A Flemish Calvary, A.D. 1550" (159), a brilliantly coloured composition in the end of room; a landscape by Edgar Barclay (164); Tom Mostyn's "By the Watchman's Fire," in which the red glow on the faces of the two hapless girls who are warming themselves is cleverly painted, are worth attention, and we must also note a characteristic study of a face by George Spencer Watson, "Une Femme du Peuple" (171). Admirable colour is seen in Richard Guy Somerset's "Lane Scene" (126); and in Napier Hemy's fisherman and boat, "Off for the Night" (110). G. F. Watts, R.A., has a subject "Paris on Ida" (106), and Henry S. Tuke sends a portrait of Miss Kitson in light heliotrope, with Marechal Niel roses, two colours that present a contrast. We cannot call them agreeable; but Mr. Tuke has here produced a graceful portrait of the young lady, and has chosen to intensify the mauve by the green background. "Mrs. Mackeson" (96), by the Hon. John Collier, is an experiment in scarlet of some merit, and we admire also E. W. Waite's "April Day" (100).

In the South Room we notice a meadow scene, "The Thames at Wargrove," by Mrs. Kate G. Hastings, flat in treatment of colour, but successful in the atmosphere. Near this we see a very excellent portrait of "A. L. Boldry, Esq.," the well-known painter—by F. Markham Skipworth; the treatment and grey are both good. Mrs. Swynnerton sends a bright study of sunlight on a meadow of daisies, "Summertime" (5), and a portrait

of a boy in a blue tunic—we should say a good likeness. Mrs. Marianne Stokes's "Primavera" is clever and decorative in its key of bright green. Brilliantly painted is Miss Flora Reid's "The Truants" (8); and we must call attention to the broadly painted view by James Orrock of "The Solway" (9), Fred Hall's "Drinking Pool" (10), for its sunlight effect; Edward Stott's "A Summer Idyll" (18), girls bathing, gleams of sunlight chequering the ground through foliage; John R. Reid's "Mill on the Hill" (20), J. MacWhirter's fine coast scene near "Palermo" (49), "A Rough Heath," by E. M. Wimperis. One of the principal figure subjects is Philip Burne-Jones's dramatically painted picture, "The Vampire," for which Rudyard Kipling has penned some lines, a ghastly subject—the prostrate figure of a young man on a bed, over whom a young woman bends, which tells its own tale. The light is well managed. Hugh de T. Glazebrook paints from a stanza of Spenser's "Faerie Queen," Book III. Canto ii. The lady in blue-embroidered gown, with long dark hair and saddened expression, is conceived with much poetic feeling. J. J. Shannon, A.R.A., has a noticeable portrait in black and white of Mrs. Charles Buxton (27), a highly-expressive portrait of "The Marchioness of Granby" (33), a nice study, and a clever sketch of her little son, Lord Ross (240). A very delightful girl study is by George H. Boughton, R.A. (29), a young lady in 17th-century costume, in flat light tones, a harmony in greys. Harrington Mann has a portrait of two ladies in red bodices, Herman G. Herkomer a portrait of a gentleman (47), and George Spencer-Watson a group of children (50). Ernest Normand's "Memories" (48), a pensive maiden in Eastern costume, may also be mentioned.

In the North Room, John S. Sargent, R.A., sends a lamplight study of "Mrs. George Batten Singing" (175)—a very difficult subject. The lady is in the act of giving expression to a note. The bust and handling are certainly clever. Perhaps the best thing in the room is R. Thorne Waite's large landscape, "Would-be Trespassers," a large field in which harvesters have been at work, and a group of girls sitting on a gate. The distance and atmosphere are excellent. Of smaller studies, Mary L. Gow's dainty little sketch of "Mrs. Colin J. Patrick and Son" (184), J. S. Sargent's portrait of Mr. Geo. Swinton (245), may be named. Of subject-pictures, Herbert A. Olivier's large allegory, "Thoughtless Chance and Thoughtful Destiny" (232), is larger than its merits deserve; Collier Smithers's little Chinese girl, "A la Petite Chinoise" (188), is clean in the costume and colour. The seascape of Robert W. Allan, "Summer Days," is fresh and strong in colour; and the large sunny picture by Alfred East, "An Idyll of Spring," with its blossom of trees and lake (239), and Alfred Parsons' large flat landscape "Allotments" (210), are worth notice. T. C. Gotch's little studies "Jubilate Deo" (191), in a scarlet key, another similar subject, "Magnificat," in the balcony, are in a high degree decorative. In the balcony are to be seen a few spirited sketches and studies. Nora Davison is always a delightful portrayer of harbours and vessels. "The Eve of Departure" (287) is one of these, sharp and decisive in touch. E. Salomons also gives us some very bright sketches of "Old Houses, Morlaix" (350), "La Porte du Roi, Mont St. Michel" (363), and "St. Malo," admirable in detail and decision of touch; R. Phené Spiers a nice water-colour sketch of a picturesque house at Rothenburg am Sauber" (392), and among other works we must notice a nice study of a girl, "The Yellow Book," rich in colour, in blues and old gold draperies.

Other studies of interest are by Francis

Black (331), Frank W. Carter (334), Albert Goodwin (315), Olive Hall (310), J. Aumonier (311), and Louis Davis (298).

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—XVI.

**BOX-GIRDERS** make serviceable columns. When attached to a base-plate with gussets they are very stable; and the box-form of column has been adopted extensively in the early days of the use of wrought iron and steel, and there must be very many of these, the interiors of which have never been examined or painted since the time when they were erected; but so many warnings have been sounded of late years respecting the danger of corrosion hidden from inspection that few would care now to use boxed columns for any permanent works. Neither is there much need to do so since open types are equally available; but the box-column has this advantage, that attachments of any kind can be made to it, and this is an advantage in many places, as in workshops. Brackets and broad ends of girders can be riveted or bolted direct to either of its broad faces, while, on the other hand, with many of the open columns it often requires some special scheming and extra outlay to get broad and rigid connections attached thereto; but these considerations must not be allowed to outweigh the necessity for durability. Broad bed-plates are used for the support of these columns. They are of cast

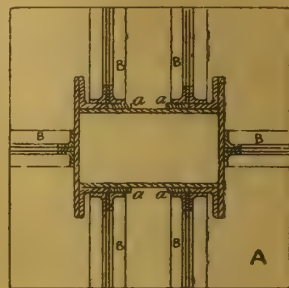


FIG. 67.

or wrought iron or steel; they rest upon masonry or concrete, and the superstructure is bedded well upon them with planed joints, or with lead sheet, or with cement.

Fig. 67 shows a section through a boxed column used on some dock-sheds, illustrating its method of attachment, by means of built-up brackets to its base-plate A; the brackets B are built of plate and angle, and riveted to each face. Packing pieces *a a* have to be inserted where the brackets pass beyond the edges of the angles against which they abut.

Fig. 68 illustrates one of the base or foundation plates which was used for the support of the built-up wrought-iron box columns of the Machinery Hall in the 1878 Paris Exhibition. It comprises two plates, A and B, connected by channels B B; B B abut against a channel, C, riveted to the plate B; one of the plates, D, which forms one thickness of the plates of the front portion of the column, is brought down and riveted to the channel C; angle-irons unite all these together. Channels and angles are similarly riveted to plate A, and a plate comes down from the back portion of the column at E, and is riveted to a channel; brackets of plate and angle are riveted on each side at F F. The view is taken as a horizontal section through the webs of the channel irons, the top flanges being removed. Fig. 69 shows the column in cross-section with the base beneath; it is formed of four plated sides, connected with angle-irons and diaphragms. It is shown in horizontal section, the diaphragms being omitted. It is attached to the top flanges of the channels on the base by means of angles A, a lead plate intervening; there is but one thickness of plate at the broad sides, but two and three thicknesses are required at front and back at different heights to suit the intensities of the different strains. The connecting angles are seen in section—*a a* are simply cover-plates beneath the side angles; in the thicker parts, internal as well as external, angle-irons are used. The diaphragms connect and stiffen the broad flat sides, being united thereto by means of angle-irons. The upper portion of the column is spread out to receive the window standards and the



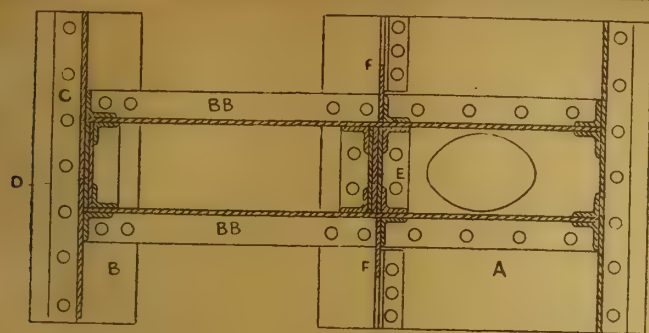


Fig. 68.

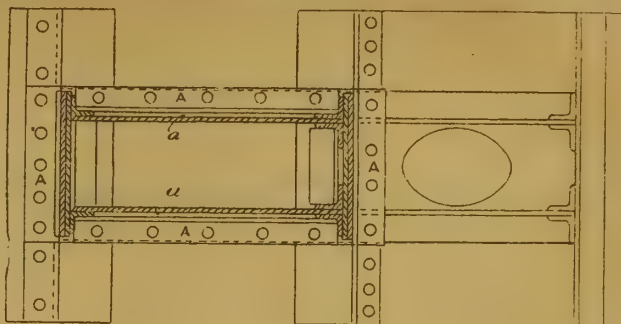


Fig. 69.

springing of the roof truss. Fig. 70 shows the commencement of the extension, at which point a joint is made between the side plates with a cover-plate A on each side, and also shows the fitting of a diaphragm B. The solid-plated

Figs. 72, 73, illustrate the method of construction of the stanchions which were used for the pier pavilion erected four years ago at Clacton-on-Sea. Fig. 73 is a sectional plan, and Fig. 72 a part elevation at the base. The structure com-

superimposed and riveted together when thicknesses of 2in. or more are wanted.

The large areas given to the bases of these columns may seem at first sight excessive, but they are necessary in order to prevent incipient yielding. The large difference in the strength of a column which has its ends flat and firmly fixed, and one in which the ends are rounding and pivoted, is the reason why such large areas are

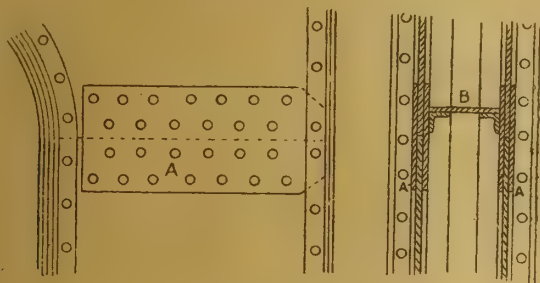


Fig. 70.

diaphragms, Fig. 70, have no recommendation, except that of cheapness, because they block up all possible access to the interior of a boxed girder for purposes of examination; if a girder is boxed

prises two box columns, A A, united by a web, B; each column comprises two flange-plates, *aa*, two web-plates, *bb*, united with angles; the web C, which connects the box columns, is united to each with unequal-sided angles. The web is not continuous through the entire height, but spaces are left for window-sashes; the box columns are riveted to sole-plates, *dd*, which in turn are bolted upon timber bearers. The angle-brackets *ee*, *ff*, serve to connect the columns to the sole-plates.

Fig. 74 shows one of the main stanchions in the basement of the Great Northern Railway Goods

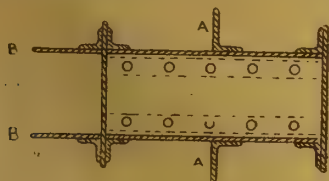


Fig. 71.

up, at least the diaphragm ought to be made of angle or tee section welded round into frames, so leaving a clear space sufficient for a slim man or lad to get inside.

Fig. 71 is a section of the window standard of

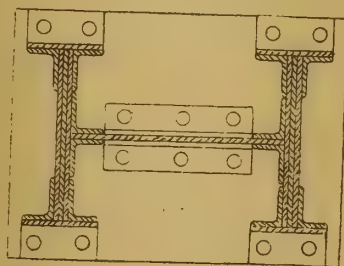


Fig. 72.

Depot, Farringdon-road; they were designed with a view to leave the interior open for periodical painting. They are built up of bars, plates, and angles, giving a section which in smaller columns is obtained by the union of one deep and two shallow joists. The outer angles are stiffened with covering-plates, A, to within about 4in. of the top, and further stiffening is afforded by means of ties, B, riveted at intervals of about 5in. apart; there is no portion wholly boxed in. The base C is attached to the column with stiff brackets of plate and angle, while the cap D is attached with four angles, as shown. Fig. 75 shows a stanchion of open section employed in the same goods depot, built of plate and angle, together with its attachment to the top plate.

A point we may notice in several of these figures is the augmenting of strength by increasing the number of thin plates in localities subject to maximum stress. Although plates are rolled in iron and steel over 1in. thick, it is seldom that any over from  $\frac{3}{4}$ in. to  $\frac{1}{2}$ in. are used in structural work, because it is better to go to maximum limits in length and width rather than thickness. Often half a dozen plates or more will be

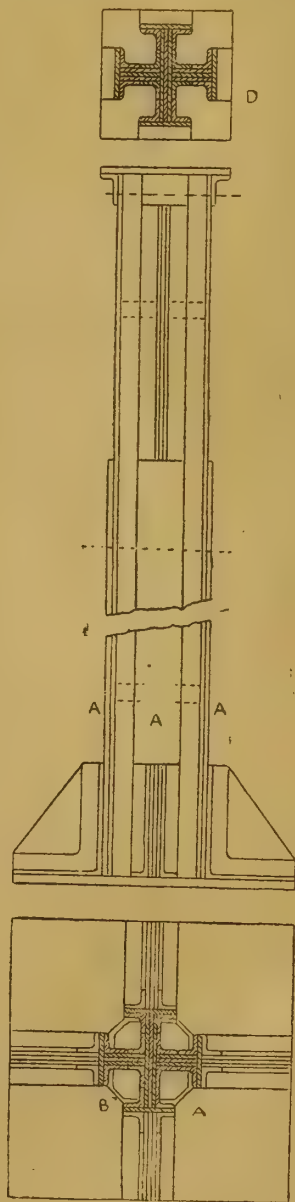


Fig. 74.

imparted and why the ends are bedded so carefully. If a column begins to bend to a sensible degree, it takes permanent set and is practically crippled, and the longer a column is, the more easily is it crippled. Since columns firmly fixed in the first place may become thrown out of perpendicular in consequence of sinking of foundations, or of stresses coming diagonally upon

the Machinery Hall; it also is a boxed column, formed of plates and angles, and is introduced to show the deep angles A A, which are introduced to afford lateral stiffness. The ribs B B serve as points of attachment for roof tracings; the dotted plates and angles are internal diaphragms.

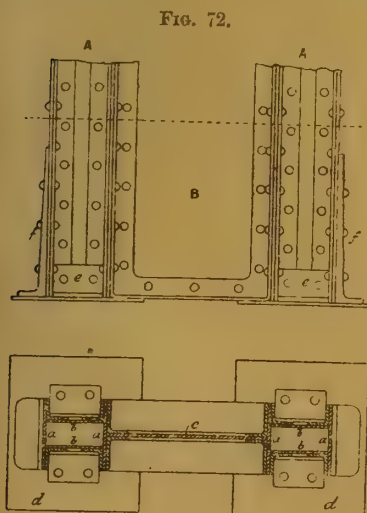


Fig. 73.



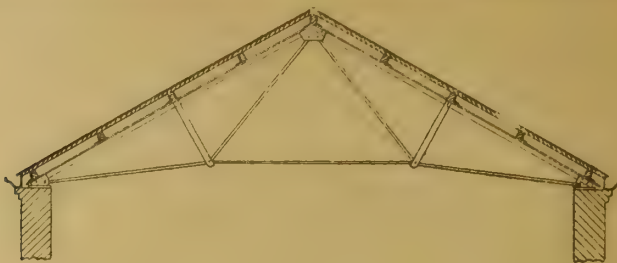


Fig. 118.

them, excess of area and ample bracketing should be imparted to the base and cap. It is often stipulated, further, that caps shall be planed and bases bedded on concrete, or felt, or lead, or timber, the idea being to prevent all chance of bending of the column occurring, or of stresses being transmitted in any way except through the axis of the column.

Whatever the form of brackets used, whether built up of plate and angle, or forged knees, or common angles, they are always, when practicable, made unequal-sided, the larger side going next the column; any shearing stress which may be transmitted is then distributed over a larger number of rivets.

J. H.

### STABLE CONSTRUCTION AND SANITATION.—XII.\*

#### ROOFS.

THE roofs of stables are generally constructed of wood and covered with slates or tiles. Where ceilings are provided it is convenient to use timber trusses; but for open roofs iron trusses are to be preferred on sanitary grounds, owing to the non-absorbent nature of the material. Open roofs supported on iron trusses also provide a much lighter and neater appearance to the interior of the building than can be obtained with timber trusses. The ironwork should be thoroughly well painted to prevent corrosion, and periodically overhauled and repainted, in order that the whole may be maintained in a sound condition.

Fig. 25 shows a collar-beam roof suitable for an ordinary stable of 18ft. span. It is covered with  $\frac{1}{2}$ in. boarding and countess slating. The rafters are placed 12in. apart, and tied with a collar-beam at one quarter the height of the roof.

The following table shows the scantlings necessary for collar-beam roofs, with ceiling on the under-side, for spans up to 18ft. :—

TABLE OF SCANTLINGS FOR COLLAR-BEAM ROOFS WHEN TIED AT ONE QUARTER THE HEIGHT OF THE ROOF, AND CEILED ON THE UNDER SIDE.

Span.	Rafters 12in. apart.	Collar-ties.
Feet.	Inches.	Inches.
10	4½ × 2½	4½ × 2
12	5 × 2½	5½ × 2½
14	5½ × 2½	6 × 2½
16	6 × 2½	6½ × 2½
18	6½ × 2½	7 × 2

For spans exceeding 18ft. and up to 30ft. the roofs, when ceiled on the under side and constructed of timber, should be supported on king-post trusses (see Figs. 37 and 38). The trusses are spaced 10ft. apart, and the scantlings required for various spans are as follows, viz. :—

TABLE OF SCANTLINGS FOR ROOFS OF VARIOUS SPANS WHEN SUPPORTED ON KING-POST TRUSSES SPACED 10FT. APART, AND CEILED ON UNDER SIDE OF TIE-BEAM.

Span.	Tie-beam.	King-post.	Principal Rafters.	Struts.	Purlins.	Common Rafters.	Ridge.	Pole-plate.
	T.B.	K.P.	P.R.	S.	P.	C.R.	R.	P.P.
ft.	in.	in.	in.	in.	in.	in.	in.	in.
20	9 × 4	4 × 3½	4 × 4	4 × 2½	8 × 4½	3½ × 2	7 × 1½	4 × 4
22	9½ × 4	4½ × 3½	4½ × 4	4½ × 2½	8½ × 4½	3½ × 2	7½ × 1½	4½ × 4
24	10 × 4	4½ × 3½	4½ × 4	4½ × 2½	9 × 4½	3½ × 2	8 × 1½	4½ × 4
26	10½ × 4	4½ × 3½	4½ × 4	4½ × 2½	9½ × 4½	3½ × 2	8½ × 1½	4½ × 4
28	11 × 4	4½ × 3½	4½ × 4	4½ × 2½	10 × 4½	3½ × 2	9 × 1½	4½ × 4
30	11½ × 4	4½ × 3½	4½ × 4	4½ × 2½	10½ × 4½	3½ × 2	9½ × 1½	4½ × 4

In the case of open roofs, where no ceiling is required, the scantling of the king-post trusses

may be slightly reduced, as indicated in the following table, viz. :—

TABLE OF SCANTLINGS FOR ROOFS OF VARIOUS SPANS WHEN SUPPORTED ON KING-POST TRUSSES SPACED 10FT. APART, AND NO CEILING IS REQUIRED.

Span.	Tie-beam.	King-post.	Principal Rafters.	Struts.	Purlins.	Common Rafters.	Ridge.	Pole-plate.
	T.B.	K.P.	P.R.	S.	P.	C.R.	R.	P.P.
ft.	in.	in.	in.	in.	in.	in.	in.	in.
20	9 × 3½	3½ × 3	4½ × 3½	3½ × 2½	8 × 4½	3½ × 2	7 × 1½	4 × 4
22	9½ × 4	4 × 3½	5 × 4	4 × 2½	8½ × 4½	3½ × 2	7½ × 1½	4½ × 4
24	10 × 4	4½ × 3½	5½ × 4	4½ × 2½	9 × 4½	3½ × 2	8 × 1½	4½ × 4
26	10½ × 4	4½ × 3½	5½ × 4	4½ × 2½	9½ × 4½	3½ × 2	8½ × 1½	4½ × 4
28	11 × 4	4½ × 3½	5½ × 4	4½ × 2½	10 × 4½	3½ × 2	9 × 1½	4½ × 4
30	11½ × 5	5 × 4	5½ × 5	5 × 2½	10½ × 4½	3½ × 2	9½ × 1½	4½ × 4

Timber-framed roofs for spans exceeding 30ft. should be supported on queen-post trusses spaced 10ft. apart. An open-framed roof of this class is shown in Fig. 26, having a continuous louvred ridge-ventilator above. The necessary scantlings for different spans are given in the accompanying table, the timbers being sufficiently strong to carry a ceiling on the under-side of the tie-beam :—

TABLE OF SCANTLINGS FOR ROOFS OF VARIOUS SPANS WHEN SUPPORTED ON QUEEN-POST TRUSSES SPACED 10FT. APART, AND CEILED ON UNDER SIDE OF TIE-BEAM.

Span.	Tie-beam.	Queen-posts.	Principal Rafters.	Straining Beam.	Struts.	Purlins.	Common Rafters.	Ridge.	Pole-plate.
	T.B.	Q.P.	P.R.	S.B.	S.	P.	C.R.	R.	P.P.
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.
32	10 × 4½	4½ × 4	5 × 4½	6½ × 4½	4½ × 2½	8 × 4½	3½ × 2	7 × 1½	4 × 4
34	10½ × 4½	4½ × 4	5½ × 4½	7 × 4½	4½ × 2½	8½ × 4½	3½ × 2	7½ × 1½	4½ × 4
36	11 × 4½	4½ × 4	5½ × 4½	7½ × 4½	4½ × 2½	9 × 4½	3½ × 2	8 × 1½	4½ × 4
38	11½ × 5	4½ × 4	6 × 4½	8 × 4½	4½ × 2½	9½ × 4½	3½ × 2	8½ × 1½	4½ × 4
40	12 × 5	4½ × 4	6½ × 4½	8½ × 4½	4½ × 2½	10 × 4½	3½ × 2	9 × 1½	4½ × 4
42	12½ × 5	4½ × 4	6½ × 4½	9 × 4½	4½ × 2½	10½ × 4½	3½ × 2	9½ × 1½	4½ × 4

Where the trusses are not required to support a ceiling, the following scantlings may be substituted for open queen-post roofs, viz. :—

TABLE OF SCANTLINGS FOR ROOFS OF VARIOUS SPANS WHEN SUPPORTED ON QUEEN-POST TRUSSES SPACED 10FT. APART AND NO CEILING IS REQUIRED.

Span.	Tie-beam.	Queen-posts.	Principal Rafters.	Straining-beam.	Struts.	Purlins.	Common Rafters.	Ridge.	Pole-plate.
	T.B.	Q.P.	P.R.	S.B.	S.	P.	C.R.	R.	P.P.
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.
32	9 × 4½	4½ × 3	5 × 4½	6½ × 4½	4½ × 2½	8 × 4½	3½ × 2	7 × 1½	4 × 4
34	9½ × 4½	4½ × 3	5½ × 4½	7 × 4½	4½ × 2½	8½ × 4½	3½ × 2	7½ × 1½	4½ × 4
36	10 × 4½	4½ × 3	5½ × 4½	7½ × 4½	4½ × 2½	9 × 4½	3½ × 2	8 × 1½	4½ × 4
38	10½ × 4½	4½ × 3	6 × 4½	8 × 4½	4½ × 2½	9½ × 4½	3½ × 2	8½ × 1½	4½ × 4
40	11 × 4½	4½ × 3	6½ × 4½	8½ × 4½	4½ × 2½	10 × 4½	3½ × 2	9 × 1½	4½ × 4
42	11½ × 5	4½ × 3	6½ × 4½	9 × 4½	4½ × 2½	10½ × 4½	3½ × 2	9½ × 1½	4½ × 4

In the construction of open roofs for spans up to 22ft., iron trusses similar to that shown in Fig. 29 may be used. The principal rafters are of T-section, and the tie-rods of round bar-iron. The roof-trusses should be spaced about 8ft. apart.

The following table gives the sizes required for the different members of each truss for varying spans, viz. :—

TABLE SHOWING SIZES REQUIRED FOR IRON ROOF-TRUSSES SPACED 8FT. APART.

Span.	Principal Rafters.	Struts.	King-rod.	Tie-rods.
Ft.	Inches.	Inches.	In.	In.
18	2½ × 2½ × 0½	2½ × 2½ × 0½	0½	0½
20	3 × 3 × 0½	2½ × 2½ × 0½	0½	0½
22	3 × 3 × 0½	2½ × 2½ × 0½	0½	0½

An iron-roof truss suitable for stables from 25ft.

to 35ft. span is shown in Fig. 118. The principal rafters are of T-iron, and the tie-rods of round bar-iron, whilst the struts may be of wrought or cast iron; but wrought-iron flat bars are now chiefly used.

The sizes required for rafters and tie-rods of this form of truss are as follows, viz. :—

TABLE SHOWING SIZES REQUIRED FOR IRON ROOF-TRUSSES SPACED 8FT. APART.

Span.	Principal Rafters.	Tie-rods (A).	Tie-rods (B).
Feet.	Inches.	Inches.	Inches.
25	3 × 3 × 0½	0½	0½
30	3 × 3½ × 0½	0½	1
35	3 × 3½ × 0½	1	1½

Occasionally composite roof-trusses are used, in which the principal rafters are of timber, the remaining portion of the trusses being of iron. Such a method of construction possesses some advantages under certain circumstances; but it is not now usually adopted.

#### DOORS.

Stable doors should in all cases be sufficiently high and wide to allow the horses to enter and



Fig. 119.

leave the stable without the slightest inconvenience when fully harnessed. In passing through narrow doorways horses are liable to damage either themselves or their harness by rubbing and knocking against the jambs of the opening. The doors may be hung with hinges or arranged to slide on rollers. When hung with hinges they should invariably be designed to open outwards, so as to fall back quite flat against the wall. A small fanlight about 1ft. 6in. high should also be provided over each door.

Figs. 119, 120, 121, and 122 show the plan, internal elevation, external elevation, and section of a door and frame well suited for ordinary

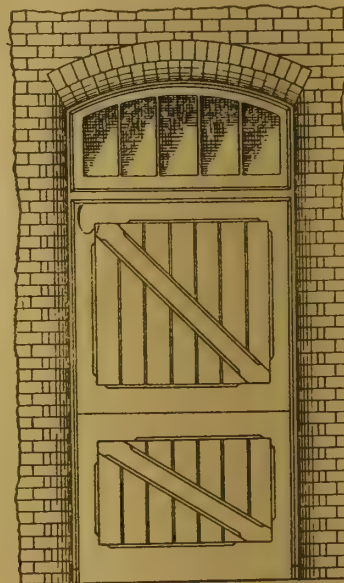


Fig. 120.

stables and cow-houses. The door is 8ft. high, 4ft. 6in. wide, and made in two heights, the lower portion being 3ft. 6in. high. The thickness is 2½in., the whole being wrought both sides, framed, braced, and filled in with lin. wrought, ploughed, tongued, and beaded battens, put together with white-lead. The top edge of the lower portion is weathered or bevelled outwards, and bound with 2½in. by ½in. strap iron, holed and countersunk, turned over 3in. at each end, and secured with 1½in. screws. The bottom edge of the upper portion of the door is bevelled upwards and inwards, so as to form a close weather-tight joint at this point, and prevent the rain driving in. The upper and lower portions are each hung with one pair of 30in. hook-and-eye strap hinges. The lower portion is secured with one or two 10in. bright rod bolts,



and the upper portion with a flush ring stable latch and strong lock. When open, the door is held back close to the wall by means of a self-acting back fastener, similar to that shown in Fig. 123.

The door-frame is 5in. by 4in. in section,

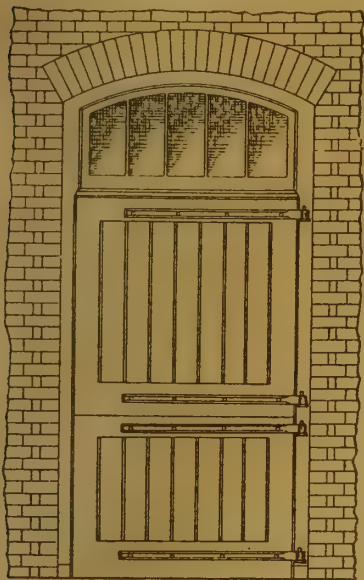


Fig. 121.

wrought, framed, rebated, and chamfered, and secured with four wrought-iron holdfasts (two on each side) built into the wall. The holdfasts have one end turned up, and are secured to the back of the frame with strong screws, the other end being split and forked, as shown by the dotted lines in Fig. 119. The ends of the door-frame are fitted with cast-iron shoes about 3in. high, 3in. thick, with 1½in. stub tenon let into the stone sill, and bedded to the frame in white-lead.

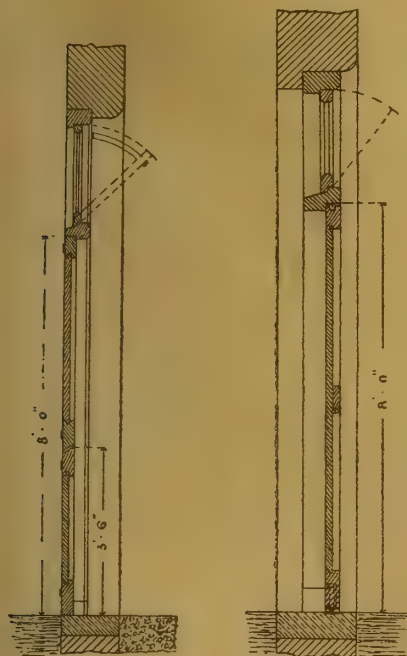


Fig. 122.

Fig. 126.

The upper part of the door-frame is formed with a 5in. by 3½in. wrought, weathered, double-rebated, and chamfered transom, having a 2in. bevel-bar fanlight above. The fanlight is rebated, weather-grooved, and hinged at the bottom edge, the sash being opened and closed by means of a quadrant stay-bar provided with a pulley, sash-line, and belaying pin. As already stated, the angles of all openings should be well rounded, and no projections of any description permitted. For stables accommodating large numbers of heavy-draught horses of the class required for breweries, carriers, &c., it is better to have the



Fig. 124.

door openings not less than 8ft. by 5ft., and provided with a sliding door, as shown in Figs. 124, 125, and 126, with or without fanlight over. The door is 2½in. thick, wrought, framed, braced,

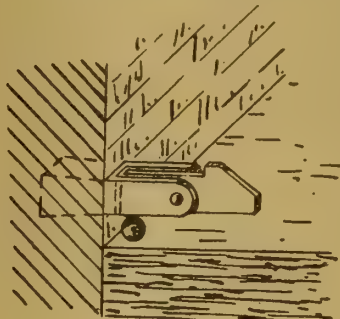


Fig. 123.

and filled-in with lin. ploughed, tongued, and beaded battens, put together with white-lead, and fitted with one pair of 5in. diameter bottom rollers, mortised into the door and running on a

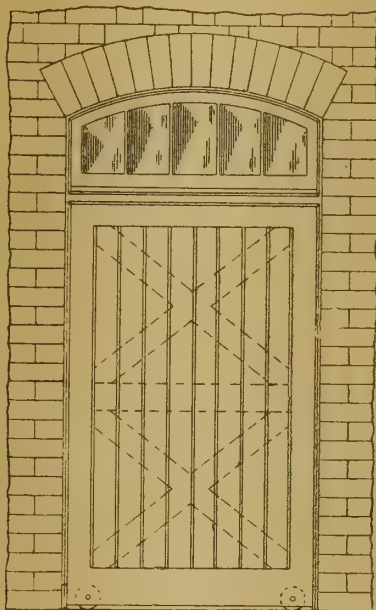


Fig. 125.

wrought-iron rail. A wrought-iron guide-bar is screwed to the back of the transom, the upper edge of the door being prepared to receive the corresponding grooved rail required in connection with the form of guide-bar shown.

#### THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK.

UNDER the editorship of Messrs. W. C. B. Lewis and John Begg, the second volume of the third series of this most capable and well-sustained publication has just been issued to subscribers. The committee one and all have in the past obtained a name individually for good drawings of old work, and consequently are well able personally to estimate the accuracy and suggestive value of the subjects submitted for publication. These capabilities, however, on the part of the management would avail but little did not the subscribers generally provide the material for the illustrations, and it must be acknowledged that the degree of merit and variety of subjects exhibited by the 72 plates in the present volume furnish ample evidence as to the industry and artistic ability of those who in this way help to maintain the Architectural Association "Sketch

Book," one of the oldest and distinctly useful features of that society. Of course, as an inevitable necessity, some of the examples selected have been already illustrated in the two former series, of which the writer of these notes has the good fortune to possess the twenty-four volumes. Few can say this, and to by far the larger number of the subscribers these duplicate drawings to which we refer are free from such an objection. Spain receives much more attention than heretofore, and although Late Renaissance remains the vogue we are glad to notice such thoroughly good measured drawings of pure Gothic work as Mr. Charles Spooner's sheets from the Presbytery of Ely Cathedral, built during the best period of the 13th century. Or, again, the 15th-century Bede house at Higham Ferrers, beautifully delineated by Mr. Shekleton Balfour. The quaint little church at Leigh, Wilts, measured up by Mr. A. Needham Wilson, showing its various details from the 13th to the 15th centuries, is among the smallest and least important buildings drawn in the book, but none the less interesting. Cromwell House, Highgate, in outline, by Mr. Alfred Bryer, is carefully drawn; but the cut brick cornices and finishings of the old house want colour to do them justice. Mr. H. P. G. Maule's complete and painstaking series of Hampton Court Palace (1690-94) make the collection doubly valuable. Mr. G. C. Horsley's sketch of a pulpit from the Duomo, Trieste, is most effectively done, and recalls some similar work in Dalmatia, drawn by Mr. T. G. Jackson, R.A., in his delightful volumes on the architecture of that country. The Jacobean pulpit from Edington Church, the welcome subject of a good drawing by Mr. R. Shekleton Balfour, is thoroughly English, with its simple and effective sounding-board over. One of the prettiest pieces of marble work delineated is the Fountain, Pallazo Stufa, Florence, sketched in South Kensington Museum by Mr. C. C. Brewer. Mr. Chas. S. Spooner's drawings from Southrepps Church, Norfolk, are typical of the most useful kind of measured studies, and show capital Gothic work of a Late, but free, type. From Andalusia, Granada, Spain, some French drawings are reproduced, giving the curious paintings from the dome of the Sala del Tribunal and the Alhambra, and lent by Mr. A. Oliver. Mr. E. H. Selby is the indefatigable secretary of the A.A. Sketch-Book Committee.

#### STREAKY BRICKS.

THE current number of the *British Clay-Worker*—a very excellent one—refers to the "latest grievance of the architect against the brickmaker": the continued and progressive introduction of sickly-looking red bricks with brown spots at frequent intervals. These bricks are usually of a strong character, and there is nothing to be said against them on that score. The "London stock" is not remarkable for its beauty; but the yellowish-grey tone it weathers into is infinitely to be preferred to the streaky product found in connection with the brown-spotted brick. The brown appears to be due to iron in most instances, but occasionally to manganese. It would not be so painfully conspicuous if the pug did its work thoroughly, for in the majority of cases the iron, at any rate, would ally itself to other ingredients in the brick-earth. As it is, the temperature used in burning is not high enough to reduce the comparatively large lumps that are left in the brick before it is placed in the kiln. These brown-spotted bricks are objectionable, not only on account of their appearance when first put up, but in regard to the unsightly manner in which they commonly weather, and the "pustulations" produced. The brickmaker can easily get rid of them by more careful preparation of the earth in the first place.

In the same number is a reproduction of the photograph taken of the Lord Mayor and Sheriffs opening the recent Building Exhibition, and some good illustrations of some of the clay exhibits there. There is also a photograph of the committee of the Institute of Clayworkers, including Mr. H. Greville Montgomery, Mr. G. M. Calender, and others.



## THE SOCIETY OF ARCHITECTS.

THE monthly meeting of the Society of Architects took place on Thursday evening in last week at St. James's Hall, Piccadilly, when a discussion took place on "The Advantages and Disadvantages to County Architects of belonging to a London Society." The President, Mr. Robert Walker, J.P., of Cork, occupied the chair, and, following the precedent of recent gatherings, the discussion was of a free and conversational character. The President introduced the subject in a bright address, giving anecdotal illustrations of the advantages to be derived by provincial men from membership with a central professional society, and then invited Mr. Henry Lovegrove, vice-president, to open the discussion. It would be possible, he said, to answer this inquiry in a very few words—the advantages were many, and the disadvantages none; but for the purpose of starting a discussion it would be well to consider the relative positions of London and provincial architects. Fifty years ago qualified architects were very scarce in the provinces, and in most small towns the local builders or their sons prepared what drawings were necessary for ordinary buildings, measured work under the old system of measure and value, and generally acting as surveyor. In this present year—the sixtieth year of the reign of Queen Victoria—able and accomplished architects are scattered over the whole of Great Britain, and it is a fact worthy of notice that a great number of the pupils and assistants of country architects are very successful in passing the R.I.B.A. examinations, many of them not only passing, but taking a very good position in the examinations. In some of the smaller towns miscellaneous practice is still general, sundry surveys and a little estate agency making up an income, while many prepare their own quantities—a practice not very general in London, where some architects do it through a salaried assistant, while many, if reports are to be believed, take a part of the commission as a kind of agency fee similar to the system in vogue between solicitors and auctioneers. The position of an architect in the country is not fixed by his profession, because there has been no recognised standard of ordinary or professional education, but by his friends and connections. If he is a member of some well-known family, and is possessed of means, he will be admitted to the best society; but if he be connected with persons of inferior position or a stranger to the place, the wife of the newly-fledged doctor will elevate her nasal organ at the architect's wife; while the vicar of the parish will notice him, as it is customary with the clergy, if he be a Churchman, according to the number and quality of his dinners and the amount of his donations; and if he should happen to be a Nonconformist, he will be completely ignored. The membership of a London Society must, under these conditions, be of distinct advantage, enabling him to use certain mystic letters after his name, but chiefly because he receives the printed Transactions or Journal, and is thereby posted up in current professional matters. True, he cannot attend the meetings of the society to hear papers and discussions; but, judging from the poor attendance at the meetings of the various professional societies, this is a privilege not very highly valued. Therefore, to all architects carrying on business outside the greatest city in the world, the centre of art, commerce, and literature, he would suggest, lose no time in obtaining membership of one of the professional societies.

Mr. ELLIS MARSLAND, hon. secretary, said he had been often asked by provincial architects, "What advantages should we get by joining your society?" True, we receive a journal, and have the doubtful distinction of seeing our names in a list; but what is there further to be gained?—for it is impossible to attend the meetings. He always replied that this was taking a wrong view of the matter; the question was not what the Society was going to do for them, but what were they going to do for the Society. He thought since the Society occasionally held meetings in provincial towns at which the officers and council attended, the country members might more often return the compliment, and endeavour to so time their visits to London as to arrange to come to the meetings; they would then come in contact with men whom they would not otherwise see, and it would be strange if each could not learn something of the other. In any case, there was an opportunity for the most isolated member to contribute to their *Journal*, and in trying to benefit

others they could not fail to derive good themselves.

Mr. MONTAGUE BALDWIN, M.A., Secretary, remarked that he was constantly in correspondence with country members, and knew that they were increasingly appreciating the advantages afforded by the arrangement recently made by which the Society's rooms were always open as a club and reading room, at which letters could be written and dated, and at which appointments could be made, while the *Journal* was becoming more and more used as a means of intercommunication. Even in the matter of £ s. d., a provincial member often benefited by belonging to a London society. A case recently occurred in which an architect practising in a remote town was given a commission by a client who simply found his name in the list of members of the Society, and made inquiries at its headquarters, which proved satisfactory. The work was so well done that it led to two or three other commissions, and they could not tell where it would stop.

Mr. EDGAR FARMAN, solicitor to the Society, in a humorous speech, remarked that as Mr. Lovegrove had said, it would be difficult to take the other side, for there were undoubtedly mutual advantages to be derived by everyone from belonging to a London body—mutual, that was, if the member paid his subscription punctually.

Mr. WHITBURN, MAJOR LESLIE, R.E., and others took part in the meeting, and at the close a vote of thanks was accorded to Mr. Lovegrove for so ably introducing the subject, the President observing that he trusted one result of that meeting would be that many provincial members would volunteer to contribute practical papers from which the Council might make a selection.

## THE SURVEYORS' INSTITUTION.

AN interesting paper entitled "Some Legal Incidents of Tenancies of Urban Property, as Illustrated by Recent Decisions," was read before the above society on Monday evening last by Mr. J. H. Redman (barrister-at-law). The author began by considering the negotiations preliminary to a lease, and warned surveyors that what might seem to be only negotiations might sometimes amount to a binding contract. To use his own words, "Nothing is more clearly settled than that any informal document, or any number of letters or other documents relating to the same transaction, which show on their face that the parties themselves, or their duly authorised agents, have finally assented to all the essential terms of a proposed lease, amounts to an absolute and binding agreement, notwithstanding a stipulation that the terms shall be embodied in a more formal contract." This rule might act against the intentions of the parties; but its stringency was shown in the case of "Chippierfield v. Carter," recently decided. However, it might be put beyond question that the matter was still under negotiation by stipulating that the acceptance of certain terms was "conditional on" or "subject to" the preparation and approval of a certain contract, in which case there was no final agreement until the formal contract was signed; but the words "subject to the contract as agreed upon" were held not to be conditional. On the question of derogation from a grant, which arose principally in the matter of easements, it was a well-known law that if the owner of a house and adjoining land granted a lease of the house first, neither he nor anyone claiming under him could use the land so as to obstruct the lights of the house. If he granted a lease of the land first, reserving the house, the lessee of the land might build so as to obstruct the light of the house. Where, however, the land and house were let by contemporaneous documents, the house enjoyed a right of light which the lessee of the land could not destroy. But this maxim could not be invoked in defence of any act contrary to good faith, nor did the house enjoy any easement of light inconsistent with the obvious intention at the time of the grant, and known to the lessee. The landlord might not use his adjoining land in any way inconsistent with the stability of the premises he had demised, or with their full beneficial enjoyment by the lessee for the purpose for which to the knowledge of the landlord they were taken. Thus if land were taken for the express purpose of drying timber, neither the lessor nor his subsequent tenants of adjoining land might interrupt the sufficient flow

of air; although if it were only taken for general purposes, only such air as came through a definite aperture such as a window could be claimed. In underleases there should be an express stipulation to perform and observe the covenants of the superior lease, and not merely the insertion of covenants in the same terms, which might not be identical in effect—as, for instance, in the case of covenants to repair in a lease, and in an under-lease twenty years later. The author gave a word of caution to proposing underlessees and their agents, to see that the landlord had power to grant an underlease for the term proposed. According to the latest authorities, if a man having a lease, eight years of which was unexpired, granted an underlease for, say, ten years, not using the word "demise," there would be no implied covenant that the tenant should enjoy quiet possession beyond the eight years; but if he used the word "demise" in his deed, he would be liable for damages, if the tenant were evicted before the end of ten years. There was no implied warranty that an unfurnished house was fit for occupation, although it was let for that purpose; but in the case of a furnished house there was such an implied warranty. The rule was an extremely artificial one, and it was clear that there was no implied warranty that the house should remain fit for habitation. As to covenants to repair, the rule to be deduced from the cases was that the condition of the premises at the commencement of a tenancy must be taken into consideration, and that a tenant who enters upon an old house was not bound to leave it in the same state as if it were a new one. "What the natural operation time flowing on effects, and all that the elements bring about in diminishing the value, constitute a loss which, so far as it results from time and nature, falls upon the landlord," was the dictum of Chief Justice Tindal. With regard to covenants against assignment, if it were provided that "a license to assign should not be withheld if the assignee be respectable and responsible," the landlord could not refuse his license if these conditions were fulfilled, but the license should in any case be applied for. If it were provided that the license should not be arbitrarily or unreasonably refused, the license must certainly be applied for, or a breach of covenant would be committed, although if it were then "unreasonably" refused, the tenant might assign without it. The unreasonableness depended on the facts of each case. Restrictive covenants might be divided into—(1) not to trade, but to use premises as a dwelling-house only; (2) not to carry on certain trades; and (3) not to use premises so as to cause nuisance or annoyance to the landlord or his tenants. And many leases were rendered very obscure by the redundancy with which the covenants were worded. If a house was to be used "only as a private residence," those words were sufficient. The word "trade," which meant buying and selling, must be distinguished from "business," which included any substantial avocation of a person. The word "annoyance" had been decided to include anything which, in the minds of reasonable, sensible people (as distinguished from fanciful people), would interfere with the ordinary comfort of existence. Thus, to use premises as a hospital for skin diseases, for boxing competitions, or for dancing rooms, might fairly be deemed to be an annoyance to a private residence next door. Dealing with "flats," Mr. Redman said a flat was a house, the outer door of it being as sacred from invasion either by landlord or stranger, as the front door of a house in a street, and an unfurnished flat stood on the same footing as an unfurnished house, and a tenant should therefore satisfy himself as to its fitness for occupation. Where the flat only was leased to the tenant the Court of Appeal held ("Miller v. Hancock") that there was an implied agreement by the landlord to keep the staircase and hall in repair, so as to afford a reasonably safe entrance and exit to the tenant and those having business with him. The author then dealt with the valuation clauses in leases, and said that the line was a very fine one between a valuation which had been described as a proceeding to prevent differences from arising and an arbitration which was for the settlement of such difficulties as arose. With regard to penal rents, the tendency of modern authority had been to place such payments on the same footing as a similar reservation in an ordinary contract, applying to them the recognised rules as to penalties and liquidated damages.

A vote of thanks having been moved by Mr.



P. E. Pilditch and seconded by Mr. H. Chatfield Clarke, and carried unanimously, the discussion was then adjourned.

INSTITUTIONAL BUILDING DURING THE DIAMOND JUBILEE.\*

VIEWED simply as a record of completed works, this handsome volume is in itself no mean contribution to the architectural history of the past decade. The twenty-five institutions which are illustrated do not by any means exhaust the long list of similar buildings erected by Mr. J. Passmore Edwards, nor do they include others still in progress, or to be erected in the near future. Taken as they stand, however, they unitedly constitute a noble contribution to the stream of individual and organised endeavours made during a notable year of a notable reign for the general good.

As many know, and as Mr. Passmore Edwards explains in the introductory chapter, his aim in supplying these institutions has been to promote the greatest and lasting good of the greatest numbers. It doubtless occurred to him, when he began to devote the magnificent sums he has expended, that many institutions of the past have been diverted from their original purpose, and that many generous philanthropists, if they could revisit the scenes of their labours, would be horrified at the diversion of the benefits they founded, from those for whom they were intended. Mr. Edwards therefore determined that the institutions founded by him should minister to the physical well-being and general advancement of the people, and that, as far as he could secure it, they should be under the control of the people. To educate the ignorant, to help the weak, to make the lot of the suffering easier, and to give the strong ample opportunities to do their best for themselves and the community—these have been the objects steadily kept in view by Mr. Passmore Edwards, and all who know anything of the working of the institutions he has aided or founded are unanimously agreed that success has crowned his efforts. Whether it influenced him at all, we cannot say; but the readers of the BUILDING NEWS, at any rate, may legitimately congratulate themselves that the large amounts expended—some part of which doubtless was derived from the modest profits of this journal—have, in no inconsiderable degree, provided work for, and brought business to, its readers and supporters. Architects and builders have been, to a large extent, the ministers of Mr. Passmore Edwards' munificence, and we may be allowed to congratulate them on it.

The illustrations, which are reproductions of those which have already appeared in our own pages, embrace the Public Library in Kingsland-road, extended and remodelled under the direction of Mr. Maurice B. Adams, F.R.I.B.A.; the Public Baths and Free Library for Shoreditch, erected from designs by Mr. H. T. Hare; the Public Library, Nunhead, from designs by Mr. R. P. Whellock, A.R.I.B.A.; the Dulwich Public Library, of which Messrs. Charles Barry and Son are the architects; the South London Art Gallery and Technical Institute, Peckham-road, designed by Mr. Maurice B. Adams, F.R.I.B.A.; the Free Library at Liskeard; the Free Library at St. Ives, Messrs. J. Symons and Sons, architects; the Free Library and Art and Science Schools, Bodmin, Mr. Silvanus Trevail, F.R.I.B.A., architect; the design for suggested Free Library and Technical Schools at Launceston, by the same architect; the Central Technical Schools for Cornwall, also by Mr. Trevail; the Metropolitan Convalescent Home near Staplehurst; the Passmore Edwards Settlement, Tavistock-place, Bloomsbury, designed by Messrs. Smith and Brewer; the Home for Epileptic Women at Chalfont St. Peter's, Mr. E. C. Shearman, architect; the three Homes at the same place for Epileptic Men, Boys, and Girls, designed by Mr. Maurice B. Adams, F.R.I.B.A.; the Public Library at Edmonton, by the same architect; the Working Men's Convalescent Home at Pegwell Bay; the Public Library at St. George's in the East, designed by Mr. Maurice B. Adams; the Convalescent Home for Friendly Societies at Limsfield, architect Mr. A. Saxon Snell, F.R.I.B.A.; the Cottage Hospital at Acton, designed by Mr. Chas. Bell,

\* Institutional Building During the Diamond Jubilee of Queen Victoria. By J. PASSMORE EDWARDS. London: Jas. Akerman.

F.R.I.B.A.; the suggested design for the Free Library at Tottenham; the Home for Cripples at Bournemouth, Mr. Frederick Warman, architect; and the Science and Art School, Helston.

CONSTRUCTION OF ARCHES IN CONCRETE.—V.

AN illustration and description of the principle adopted generally in the building of concrete arches in the Melan system, which is one of those coming within our classification of "compound systems," brought to a close our previous article. Before giving the results of the testing and actual fracture of an arch built upon this method we desire to call attention to the contents of Table A. It has been specially prepared to

TABLE A.

Name of Bridge.	Description.	No. of Spans.	Max. Span.	Max. Rise.	Depth at Crown.	Depth at Springing.	Where Erected.	Date of Erection.
Munderkingen	Cement concrete	One	165	16'50	3'32	3'60	Munderkingen	1894
Inzigkofen	Simple concrete	One	142	14'45	2'31	2'58	Hohenzollern	1896
Coulouvreniere	Simple concrete	Four	132	18'30	3'61	4'59	Geneva	1896
Reuss	Monier system	One	123	11'51	2'66	2'13	Switzerland	1893
Antwerp	Simple concrete	One	60	6'60	1'50	1'50	Antwerp	1894
Neutra	Compound system	Six	56	3'72	0'81	1'07	Hungary	1892
Island	Simple concrete	Five	50	22'36	2'00	2'00	Jamaica	1889
Pennypack Creek	Compound concrete	Two	26	6'50	2'25	2'75	Philadelphia*	—

\* This was the first concrete-arch bridge built in the United States, and is a roadway bridge.

show in a terse and compact form what has been actually and practically accomplished in the erection of arches of the materials under consideration. No hypothetical, mere experimental, simply proposed, or "paper" bridges and arches have been included in the list; it embraces only those which have been completed, opened for traffic, and are fulfilling their duties at present adequately and satisfactorily. Our readers must take the last column in Table A as only approximately correct in some instances; in any case, the exact date is of no particular importance, although it will be subsequently pointed out that there is a considerable difference between the newest and some of the older examples in the proportions and dimensions of their various parts. The influence of time, with the alterations and modifications which inevitably accompany its ever-advancing progress, can be very distinctly traced in the gradual evolution of the concrete arch—simple or compound. In the table all dimensions are recorded in feet and decimals of feet. A glance at Table A will at once very clearly indicate that no rule with any pretensions to formulated accuracy prevails with regard to the proportion of the depth of the arch at the crown, or, in fact, at any other point, to the length of span; thus we have one arch with a span of 123ft. and a depth at crown of only 8in., and another in which the similar dimensions are 50ft. and 2ft. respectively. Surely one of these proportions must be incorrect!

A little explanation respecting the two designs, although it will not altogether remove the apparently glaring contrast, will serve to reconcile in some degree the magnitude of it. In the first place, the arch with the longer span was an ordinary road bridge, while the other was designed for carrying heavy locomotive traffic; in addition, which assists further to accentuate the difference in proportions, the road bridge was subjected to a very light description of traffic. The total distributed load employed in testing the bridge did not exceed 35lb. per square foot of the horizontal roadway of the arch. It is not to be wondered at, therefore, that the sinking or sagging at the crown and the corresponding risings or upward cambers at the haunches did not surpass 0'14in. It should be noticed in connection with this question that there are three data which bear forcibly upon it, not one of which is sufficient by itself to afford the basis of a thoroughly reliable investigation and of a rigorously accurate calculation. The three data alluded to are theory, practice, and rules deduced from actually efficient existing examples. These last, or empirical rules as they are termed, answer fairly well when the conditions obtaining are approximately similar; but in cases, as continually occur, the dimensions and proportions of one bridge are widely at variance with those of another. Obviously, the mere fact that a certain calculated depth of arch answered admirably for a certain length of span would not of itself be conclusive that the same

formula would apply in attempting to determine the depth proper for a span of one-third of the former length. The aid of the two other elements, theory and practice, must be called in before anything approaching a satisfactory result can be arrived at, and, even then, some divergences and inconsistencies have to be partially eliminated, reconciled, or, so to speak, smoothed away, before the workable figure is worthy of acceptance. If we compare the relative thicknesses or depths at the crown of arches built of concrete, stone, and brick, they may be classified as positive, comparative, and superlative, or as minimum, mean, and maximum.

One of the objects of the experiments we are now investigating was to obtain data for deducing a fairly reliable formula and rule for the calculation of the effective depth of an arch of concrete

at the three different points where its determination becomes indispensable. As our subject is proceeded with, the conclusions arrived at will become apparent. Since there exist some conditions common to the arches constructed of the three materials, a brief inquiry into the ordinary rules used by engineers and architects for ascertaining the depth of the arching will not be inappropriate to the subject of our article. Some of these rules involve the radius of the arch as a quantity in the calculation, while others do not. As an illustration of the correctness of the statement made above, regarding the relative proportions of the depths at the crown of arches of the three materials, we will refer to a table of the thickness required for the crown of arches of stone and brick, due to Mr. Hurst, and compare them with some of the examples in Table A, selecting the span as the standard unit. In this comparison, for reasons already alleged, we reject the "Reiss's" bridge, as the dimension in question is of an abnormal character. Commencing with the Munderkingen arch, the corresponding thicknesses at the crown for the same span in Mr. Hurst's table for arches of stone and brick are 3'99 and 5'29, both measured in feet and decimals of feet. For the next bridge, in Table A, similar dimensions are 3'41 and 4'93, and for a span of 60ft. they are 2'33 and 3'10ft. The table to which reference has been made gives the dimensions only for spans varying by constants of 10ft. after the span of 100ft. is reached. In order to adapt the value of the thicknesses to the spans of odd lengths, other than those increasing by regular additions of 10ft., proportional parts must be taken. In determining the depth or thickness at the crown of arches of stone and brick, which, with some modifications, may be made to apply in several instances to those also of concrete, there are many different formulæ in use, which, although they rarely actually agree, yet frequently fairly coincide in the results deduced from them respectively, as will be presently demonstrated. Let T represent the depth or thickness at the crown of an arch built of stone or brickwork, put R for the radius at the crown, and C for a constant, varying in value according to the nature of the material employed, then we have generally—

$$T = C \times R^{\frac{1}{2}} \dots\dots\dots (1)$$

In the equation (1) C may be taken equal to 0'32 for stone and to 0'43 for brickwork. Rankine's rule, using the same units and symbols, may be written—

$$T = (0'13 R)^{\frac{1}{2}} \dots\dots\dots (2)$$

which is clearly of the same form as (1). The Continental engineers prefer a formula which may be thus expressed—

$$T = \frac{S + 26'78}{24} \dots\dots\dots (3)$$

In America Mr. Trautwine's rule is usually



adopted; but it is a little more complicated than the other three, thus—

$$T = \frac{(S + 2R)^2}{144} + 0.2 \quad \dots \dots \dots (4)$$

It is to be noticed that in all these equations the radix  $\sqrt{\phantom{x}}$ , or its equivalent index  $\frac{1}{2}$ , is a constant, excepting in (3).

Let these formulæ be now applied to an existing example, and for that purpose we will take the stone bridge of the largest span in England and the third largest in the world. It is the Grosvenor Bridge over the river Dee at Chester. Its dimensions are, span equal to 200ft., and rise 42ft.

The two other larger bridges are that over the Cabin John Aqueduct at Washington, with a span of 220ft. and a rise of 57ft., and the other the Saremise Bridge, having a span of 213ft. In instituting a comparison between these three magnificent examples of arches constructed of masonry, it should be borne in mind that the last mentioned is in one respect the most remarkable, since it carries railway traffic, which neither the American nor English bridge does.

Since in the Grosvenor arch the rise bears no definite integral proportion to the span, it will be preferable to use a simpler rule for finding the radius than that given in our first article. Putting  $R$ , as before, for the radius,  $S$  for the half-span, and  $V$  for the rise, we obtain—

$$R = \frac{S^2 + V^2}{2V},$$

from which, by inserting the proper values for the symbols—

$$R = \frac{(100)^2 + (42)^2}{84} = 140\text{ft.}$$

Applying equation (1) we find the thickness,  $T$ , all the dimensions being in feet, to be equal to—

$$T = 0.32 \times 11.832 = 3.78\text{ft.}$$

Formula (2) will give us—

$$T = \sqrt{18 \cdot 20} = 4.27\text{ft.}$$

By the Continental rule, the thickness is—

$$T = \frac{18.9}{2} = 9.45\text{ft.}$$

It should be mentioned here that it is typical of formula (3) that it usually gives a much higher value for  $T$  than the other rules. By equation (4), solving for the value of the thickness, the calculation stands—

$$T = \frac{21.909 + 1.1312}{5.666} = 4.075\text{ft.}$$

Mr. Hurst's table, already quoted, or, at any rate, the copy in our possession, does not give values for the dimension in question, for spans exceeding 180ft. Although we are aware that it is not a strictly accurate method of applying his figures, yet it is near enough practically by calculating proportionally what the depth at the crown of the arch would be for a span of 200ft. It will be found to work out to very nearly 4.94ft. The actually constructed thickness of the crown of the arch of the Grosvenor Bridge is 4.6ft. Summing up, therefore, and rejecting formula (3) as unsuited for large spans, Rankine's and Hurst's rules are the nearest approximations to the real depth of keystone, the one being nearly exactly as much in excess, or plus, as the other is minus the true value. It may be here stated, as it is not generally known, that though it is advisable in the majority of instances, especially when the length of the span of the bridge exceeds very moderate dimensions, to increase the depth of the arch gradually towards the springings; yet in the case of small arches, it is not absolutely necessary so to do.

Returning to our experiments and tests, the next that presents itself is the trial of an arch designed and built on the Melan system. The span of the arch was 13ft., the rise 11.6in., and the breadth or length at right angles to the face or axis 10ft. It was built up in the following manner:—At distances of every 3ft., small rolled steel joists, 3½in. deep, were firmly bedded in layers of concrete brought up flush with their upper and lower flanges. These joists were literally buried or drowned in the semi-fluid mass. It has been previously stated that a perfectly intimate mixture, an absolutely incorporation of the combining constructive materials, are indispensable to the strength and durability of the structure, whether it take the form of a small flooring arch, or of one doing duty as either a road or railway bridge. In the experi-

ment now referred to, as in former instances in which the length of the spans did not permit the whole arch to be loaded, the pigs of cast iron were successively and gradually super-imposed upon one of the halves of the arch, so as to fulfil the conditions of a uniformly distributed load over the layer of sand which formed a kind of cushion or intermediate buffer. When the total load had reached 0.636 of a ton per square foot, the testing was discontinued for a few days; but at this stage no cracks or fissures of any description had made their appearance. Upon the renewal of the experiment, the arch ultimately failed under a breaking weight of 1.454 tons per same unit of surface. Fissures did not present themselves until just before the last ton was placed on, which is a circumstance worth noting, when it is considered that in nearly all the tests carried out with arches built on the simple system, the fissures, as well as local cracks, were strongly in evidence long before the breaking load was reached. The Melan arch was finally ruptured at two sections, thus dividing it, as in the other tests recorded, into three pieces. Comparing the breaking weight per unit of surface of this arch with those catalogued in Table 1 in our third article, the gain in strength of the compound system is too remarkable to escape notice. In fact, without taking into account the breaking weight, the load of 0.636 of a ton per square foot, supported easily, and without the arch evincing the slightest symptom of fatigue or resulting stress, exceeds slightly the maximum load at the point of fracture borne by the examples of the simple concrete system.

The actual figures, referring to Table 1, give for the breaking weight of the strongest specimen, which was that of the arch of Monier cement concrete, 0.643 of a ton per square foot, which is practically the same amount as 0.636 of a ton borne in the first stage of the experiment undertaken with the Melan arch. The proportions of the ingredients of the concrete in the latter specimen were one part of Portland cement to five parts of sharp clean sand or gravel. We have already drawn attention to some of the causes which have manifestly retarded the progress of the construction of concrete bridges in England. In fact, we have none of any dimensions worth recording, as the list adduced in Table A plainly indicates. There is plenty of room for a very considerable extension of the concrete systems employed here; but this is a subject into which we shall enter later on.

#### BUILDERS' BARRICADES AT GLASGOW.

THE statute labour committee of the corporation have recently had under consideration the subject of barricades on the streets during building operations. A report on the subject has been submitted to the committee by the master of works, in which he says:—

"According to Section 368 of the Glasgow Police Act, 1866, authority for the temporary occupation of portions of any road, street, or court, during the execution of work, is made subject to the following conditions, viz.:—'That such portion of road, street, or court shall not exceed one-fourth of the breadth thereof between the kerbstones'—for instance, in a street 60ft. wide, with footpaths 10ft. in width, the space allowed under the above Act was equal to 20ft. from the building line. Under the Act of 1892, however, the space allowed for the barricade is 15ft. in width from the building line where one-quarter of the street is granted. The Act of 1866 also states that the inclosed space 'shall be sufficiently hoarded and fenced, and lighted at night, and on the outside of such hoarding there shall be a convenient platform and handrail to serve as a footway for passengers.' This handrail, instead of being an advantage, was found to be a disadvantage, especially in streets where tram-rails were put down, the result being that persons leaving the cars frequently ran narrow escapes of being caught between the car and the railing, and on that account it has, to a large extent, been done away with. With references to barricades on the streets, so long as material is allowed to be prepared for the building on the street, barricades are necessary; but I see no reason why a builder should not prepare the stones ready to be put in position in a space of ground provided for that purpose. If that were insisted on, the necessity for inclosing so much of the street would be done away with to a large extent, and I would suggest, as a general

rule, that all materials be raised in the interior of the building, and that the crane be so placed that, in the event of any portion of it giving way, the jib would not fall on the street. In the event of very heavy material being required to be lifted from a lorry, the work should be done at such time as the street is comparatively free from passengers. If this were carried out, the covering over of the footpaths could be adopted with safety to foot-passengers, and there would be no necessity for taking up any portion of the carriageway for footpaths. What I would recommend is, that on no account should any portion of the carriageway be barricaded, but that a row of substantial wood posts be placed along the line of the kerb, another in line of the portion of the footpath to be inclosed, that the portion between these posts be covered with heavy material of wood made watertight, so that foot-passengers could walk under it with comfort and safety, and, if need be, material could be stored on top of the platform. I would also recommend that the material used for any barricading that is absolutely required should be of good quality and substantial, and that no placards be allowed to be placed on the barricade. On account of the crowded state of our streets, the time has come when the method I propose ought to be adopted, not only for convenience to the public, but in justice to shopkeepers, who must suffer in their business while a barricade is projecting into the street in connection with an adjoining building."

A letter has also been submitted to the committee by Mr. Lindsay, the clerk, in which he says that under the powers contained in the Act of 1892 power is given to the master of works to compel owners during building operations in the streets "to construct and erect a platform to be used as a footway for passengers, and a substantial overhead covering, and all of such description and dimensions, and in such position, as the master of works may direct."

The committee, after considering the report and the opinion of Mr. Lindsay, agreed to recommend that the master of works be instructed to enforce, so far as possible, the suggestions contained in his report.

#### CHIPS.

The waterworks committee have decided to recommend to the town council of Rochdale that the salary of the waterworks manager, Mr. W. T. Tomlinson, be increased from £300 to £400 per annum.

The Government expenditure incurred during 1895-96 on embankments and drainage and other miscellaneous irrigation works in the Bengal Presidency amounted to about £50,000 sterling. This is below the average for recent years.

Mr. Thomas Fuller has just retired from the position of architect-in-chief to the Public Works Department of Canada.

A stained-glass window has been inserted in the parish church of Uttoxeter in memory of a girl, aged six years. Amidst the children supposed to be gazing towards the angels which surround The Great White Throne, the artist has delineated the features of Eileen Abud, to whom the window is a memorial. The work has been executed by Messrs. Ward and Hughes, of London.

The Diamond Jubilee Commemoration Committee formed at Bury St. Edmund's has decided to place a commemoration clock upon the Norman Tower, which is one of the historical memorials of the town. The clock will be illuminated, and will be fitted with chimes. It will involve an outlay of about £400.

The scheme for the erection of fine art galleries at Bath is within measurable distance of success; of the £15,000 required, the first £11,000 has been given.

New Board schools at Horrington, near Bristol, were opened last week. The buildings are of native stone, with Douling stone dressings, and have cost over £1,250.

At the Auction Mart last week the sales were few and the properties generally of little importance, the aggregate realisation being £22,760. The present week has been one of unusual activity, and this will continue with increasing volume throughout the whole of May. Owing to the Jubilee celebration there is much hesitation in making fixtures for June, so that the summer season will be considerably curtailed, and auctioneers must look for their harvest principally to May and July. There is every reason to anticipate that the season will yield returns fully equal to those of recent years, although there is at present a deficiency in the supply of large estates and agricultural land.



## Building Intelligence.

**DUNBAR.**—The parish church of Dunbar, which has just undergone extensive alterations and improvements, was built seventy-seven years ago, and was opened on the 20th April 1821. In external design it is a fair example of what could then be accomplished at that early period of Revived Gothic, but the interior was thoroughly disappointing—a large square place with a gallery all round. The whole of the interior has been removed, and the area sub-divided into nave and aisles by stone arcades of five arches each. A semi-octagonal apse has been thrown out at the east end, opening into the nave with a chancel arch of moulded stonework, having a minister's vestry on one side and an organ-chamber on the other. In the apse are three large stained-glass windows, two from the old church and a third dedicated to the memory of the late Dowager Duchess of Roxburghe. The nave ceiling has been raised, bringing into view a part of the carpentry of the main roof. The traceried front of the old gallery has been worked into the front of the new one at the west end of the church, and the steps of the old stairs have been worked into the gallery staircases contrived in the two western turrets. The fine old pulpit has been retained, and placed against the south jamb of the chancel arch. The Dunbar monument now stands on the floor level of the church, against the east wall of the north aisle, completely restored, and has never been seen to such advantage since the day of its erection 270 years ago. All the windows have been double-glazed, the inner glass in quarries of a light amber tint. Gas has been introduced, the nave being provided with eight corona lights, and a large one of burnished brass hangs from the apse ceiling over the Communion-table. The whole of the work has been executed from the designs and under the supervision of Messrs. W. and J. Hay, architects, of Liverpool. The contractors for the mason's and joiner's work were Messrs. Robert Hall and Co., Galashiels; for slating and plastering, Messrs. Archibald Aitken and Son; for plumbing, gasfitting, and heating apparatus, Messrs. Melville and Son; for painting, Mr. Mackenzie; all of Dunbar; and for glazing, Messrs. George Lindsay, of Edinburgh. To Mr. W. G. Stevenson, sculptor, R.S.A., was intrusted the taking down and reconstructing the Dunbar monument. The two stained windows were taken out and replaced by Messrs. Ballantine and Gardiner, of Edinburgh. In place of the old cracked bell, one of nearly double its weight has been provided by Messrs. Bryden and Son, of Edinburgh. The cost of the whole work will be about £4,500.

**GLASGOW.**—Rosemount school, Millburn-street, Garngadhill, erected for the Glasgow School Board, was opened on Friday by Sir J. Neilson Cuthbertson. The school is erected on the highest point of Garngadhill. The air-space is assisted by the very considerable fall of the ground from front to back, but this difference of levels added somewhat to the difficulty of planning. This slight drawback has, however, been overcome by the placing of drill-hall, janitor's house, and heating and ventilating apparatus on the lower level facing eastward. The school and class-rooms, 16 in number, and varying in size from accommodation for 173 to 62 scholars, are grouped round the central hall on two floors, and provide places for fully 1,203 children, of which 608 are for infants at 8sq.ft. each, the remainder being at 10sq.ft. The Plenum system has been adopted for the heating and ventilation. The building is simply treated externally, the windows forming the principal feature of the elevations. The walls are of red sandstone from Ballochmyle quarries, finished in squared rubble with polished dressings. The playgrounds are laid with tar-macadam paving. The total cost, exclusive of site, is expected to come within £13,000. Mr. J. B. Wilson, A.R.I.B.A., 92, Bath-street, Glasgow, was the architect.

**THE HAYMARKET.**—Her Majesty's Theatre, situated at the corner of Charles-street and the Haymarket, was opened on Wednesday night. Its site is almost identical with that of the old opera house, which was finally demolished in 1893. The new theatre has been built from designs by Mr. C. J. Phipps, F.S.A. It is faced of Portland stone and red granite, and is in the style of the French Renaissance. A loggia distinguished by four Corinthian columns, and surmounted by a cupola, overlooks the Haymarket,

while a frontage of 160ft. runs along Charles-street. Structurally a noticeable feature is that there are only two tiers of seats above the floor instead of three, and that the stage is kept flat and does not "rake." There is hardly a place in the house from which the entire stage is not visible. The disposition of seats intended to hold between 1,600 and 1,700 people is on popular lines. There are only six boxes; the width of the auditorium enables the dress and "family" circles to be brought close to the stage. The decorations are of the period of Louis XIV.-XV., and have been carried out under the superintendence of Mr. H. Romaine Walker. The prevailing colours are red and gold, the proscenium, columns, and pilasters being worked in Brèche Violette marble with ormolu mountings. The act-drop is a reproduction of the Gobelin tapestry by Coppel, made for the Duc d'Orléans, brother of Louis XIV., representing "Dido receiving Æneas." There is an elaborate system of warming and ventilation with fans worked by electric motors. For lighting Mr. Tree relies on electric light alone. The theatre is fitted with reproductions of the Fontainebleau candle brackets, electric light being substituted for candlewicks.

**HEXHAM.**—Plans for the new grammar school have now been matured and laid before the technical education committee of the Northumberland County Council by Messrs. Oliver and Leeson, architects, Newcastle-on-Tyne, acting on the instructions of the committee in charge of the scheme. A site of about 4½ acres, immediately to the south of Hexham, has been secured. The plans provide accommodation for 150 boys, 30 being boarders. The main entrance doorway to the school is in the centre of the principal front, and to the left is the school hall, a room lighted from both sides, whilst beyond are class-rooms of various sizes. To the south of the class-rooms, in a separate wing, is the physical laboratory. On the first floor, over the class-rooms, are the chemical laboratory, preparation-room, and lecture-theatre, with a special science classroom. There will be separate cloak-rooms and lavatories for the day boys and boarders, and a common room for assistant masters. On the right of the main entrance is the boarders' common room and dining-hall, and beyond that the head master's house. Over the boarders' dining-hall and common room and main school are the boarders' dormitories, the assistant master's bedroom being placed between them, so as to secure supervision. Separated from the main building is a covered playshed for the boys, and a large room for manual instruction. Behind the master's house is an inclosed court with a drying-green, together with wash-house and laundry. The buildings are proposed to be carried out in local stone, and the roofs are to be covered with green slates.

**ROTHERHAM.**—The new town hall in Lower-road, Neptune-street, and Moodkee-street, was formally opened by Mrs. Carr-Gomm, lady of the manor, on Wednesday afternoon. The site, which has an area of 1,155 square yards, cost £3,500, and the architects, whose design was selected in a limited competition, are Messrs. Murray and Foster, of Adelphi Chambers, John-street, W.C. The style adopted is Renaissance. The elevations are of Portland stone, from the quarries of Mr. J. Barnes, and red bricks, supplied by Mr. Thomas Lawrence, of Bracknell, disposed in bands, and the roofs are covered with green Westmoreland slates. The main entrance in Lower-road opens into a vestibule, with the vestry clerk's offices on the left, the overseers' offices opposite, and the surveyor's to the right. A staircase of artificial stone leads to the rooms on first floor, including a council chamber, 50ft. by 30ft. and 23ft., panelled in oak, with ceiling of fibrous plaster by the Plastic Decoration Co., who have also supplied the ceiling of the public hall and coroner's court; the latter is on this floor. The public hall, entered from Moodkee-street, is 63ft. by 53ft., and 36ft. high, and seated for 574 persons on floor and 307 others in galleries on three sides. The ventilators have been supplied by Messrs. Kite and Co., and the chimney-pieces by Messrs. Shuffrey and Co. Mr. Howell J. Williams was the general contractor; Mr. John Carter has acted as clerk of works, and Mr. Diprose as general foreman. The total cost of the buildings has been approximately £20,000.

The date of the ceremony of inaugurating the Payne Smith Memorial Pulpit in the nave of Canterbury Cathedral has been altered to May 17.

## COMPETITIONS.

**KEIGHLEY.**—On Saturday a special meeting of the directors of the Keighley Liberal Club was held to make final selection of an architect for the new clubhouse from the four competitive sets of drawings sent in. The voting was very close, but the choice fell upon those supplied by Messrs. John Judson and Moore, of Church-street, Keighley. The new house is to be a two-story building, with main façade to Devonshire-street. Most of the club accommodation is to be provided on the ground floor, including smoke, news, card, and conversation rooms, with a spacious billiard-room lighted from above. On the first floor is to be a large assembly hall. The curator's rooms and some business offices are provided on the Scott-street side.

**NUNEATON.**—The name of the successful architect in the Conservative Club competition is Mr. C. W. Smith, Market-place, Grantham.

## CHIPS.

The Anglesey County Council have decided to apply to the Local Government Board for sanction to borrow £3,903, for the purpose of defraying the cost of erecting county buildings at Llangefni, and £9,750 towards enlarging the North Wales Counties Lunatic Asylum.

Mr. F. H. Tulloch, A.M.I.C.E., Local Government Board inspector, held an inquiry at Gloucester on Tuesday, into the corporation's application to borrow £6,000 for various purposes, the main item being £4,000 for improving the cattle market. He will report in due course.

While helping to fix a heavy Portland stone cornice on the top of the new buildings known as Albert Hall Court, W., a builder's labourer, named John Alexander, fell to the ground, a distance of 80ft., through the stonework on which he was standing giving way. Death was instantaneous.

Colonel C. H. Luard, R.E., held an inquiry at Taunton on behalf of the Local Government Board, on Tuesday, with reference to the application of the town council to borrow the sum of £1,978 in respect to the new bridge over the Tone in North Town.

A chapel has been added to the Rochester Diocesan Deaconesses' Institute at 83, North-side, Clapham Common, and was dedicated last week by the Bishop of Rochester. It has been built from designs by Mr. Philip Webb, and accommodates 150 worshippers.

The governors of the ancient County Grammar School, at Llanrwst, N. Wales, have decided to build a new girls' school, and make extensive additions to the existing boys' school. They have appointed Mr. H. Feather, of Cardiff, as their architect.

The class for architectural modelling at the R.A. Architectural School is ended for the present session, and a series of demonstrations will be given by Mr. Stannus, on the Mondays and Thursdays in May, at 6 p.m., on "Sub-Panelling in Theory, and Application to Ceiling and Vault Design."

The opening of a new school and reopening of the Congregational Chapel, Handsworth, took place on Wednesday evening. The new school includes a room capable of seating 350 adults, and an infants' schoolroom, while the existing school has been divided into ten commodious classrooms, outbuildings, &c. The heating is effected by hot-water apparatus. The church has also been redecorated, and the lighting of the buildings has been rearranged. The total cost has been about £1,600.

The Prince of Wales will visit Canterbury on May 29, when he will reopen the restored Chapter House and unveil a stained-glass window in that building, the gift of the Freemasons of Kent.

The International Art Exhibition in Venice was opened on Wednesday by the Crown Prince and Princess of Italy. Among the British and American exhibitors are Messrs. Alma Tadema, Frank Brangwyn, John Collier, Walter Crane, Alfred East, G. Jacob Hoad, William Logsdail, Adrian Stokes, F. Tuke, H. Haig, Macneill Whistler, F. A. Bridgeman, John Sargent, and Miss Clara Montalba.

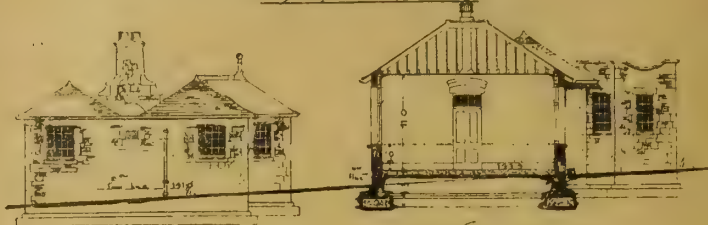
The award of the umpire (Mr. James Green) in the arbitration between the North Metropolitan Tramways Company and the London County Council has now been published. The arbitration was reported by us some time since, and the object was to arrive at the purchase money to be paid by the County Council for the stabling, depots, and other premises of the tramways company. The amount of the award is £173,136.

According to the official handbook of the Baptist Union of Great Britain and Ireland, the amount expended upon new buildings during the year was £76,807, or £17,293 more than during the previous twelve months; and chapel improvements, &c., £27,315.



— : Galeshead Union : —

— : Isolation Hospital : for :  
— : 6 Boys and 6 Girls : —



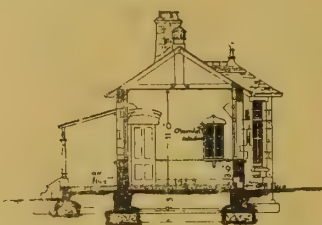
Smith East elevation of  
Kitchen &c.

Section on line A.A.

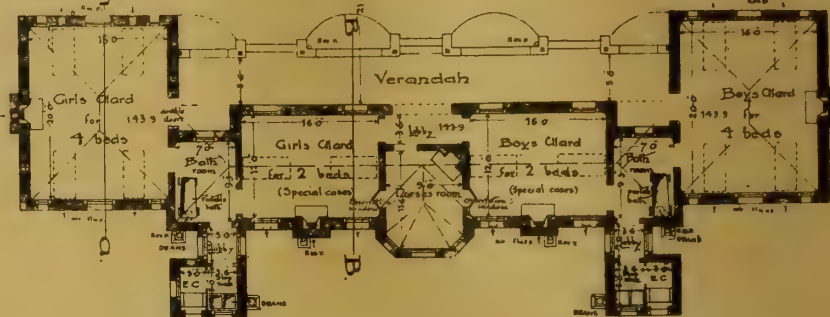


Kitchen &c. Block

Best Allg.  
Schulze  
59, Leuchterstr.  
60  
670 47  
PA. 671/100 24. 1007  
KATZBACH-60-7778



Section on line B.B.

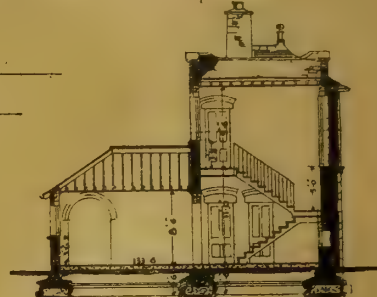


Ground Floor

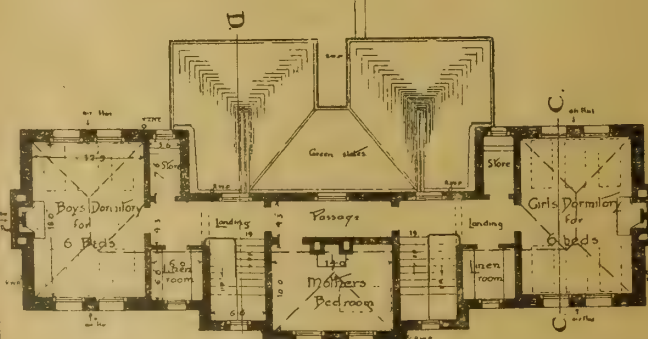
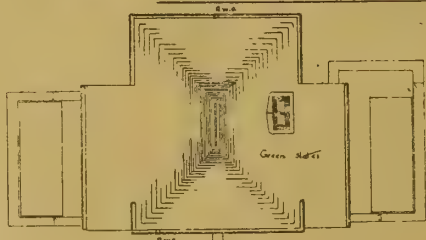
— : Receiving Wards : for :  
— : 6 Boys and 6 Girls : —



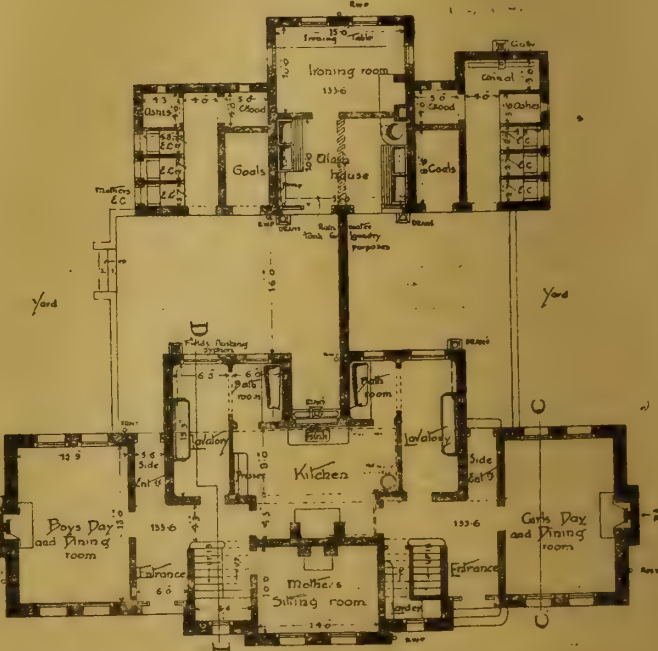
Sectional Elevation on line C.C.



Section on line D.D.



First Floor Plan:



Ground Floor Plan:

Scale 5 feet to one inch



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## ILLUSTRATIONS.

ST. GEORGE'S CHURCH, STOCKPORT: EXTERIOR AND INTERIOR VIEWS.—COTTAGE HOMES FOR THE GATESHEAD UNION.

## Our Illustrations.

ST. GEORGE'S CHURCH, HEAVILEY, STOCKPORT.

THIS church, which we illustrate to-day from the fine drawings hung in the Royal Academy Exhibition, has occupied about five years in building. It is designed in the Transitional style from Decorated to Perpendicular, by Messrs. Austin and Paley, architects, of Lancaster. On plan it consists of a nave of six bays, 112ft. long, by 29ft. wide; north and south aisles, 19ft. 3in. wide; chancel, 68ft. 9in. long, by 28ft. 6in. wide; morning chapel on north side, 42ft. by 25ft., with separate entrance porch; organ transept on south, 28ft. 6in. by 22ft. 6in.; with spacious choir and clergy vestries, with offices on eastern side of same. The church is entered at the west end by north and south porches, and a western door. Over the crossing is a tower 32ft. by 35ft. 8in., outside measurement, and surmounted by a spire rising to a height of 235ft. The east and west windows are of seven lights, 21ft. across; these are fitted with stained glass, the work of Messrs. Shrigley and Hunt, of Lancaster and London. The nave has a clerestory of ten square-headed tracery windows on each side, of two lights; the parapets throughout are battlemented. The bays of nave are well marked by shafts, which run up and support the principals of roof, the wall space above the arch being panelled with vertical ribs (in continuation of the lines of the window mullions), mitring with string, which forms the sill of clerestory. The height to the wall-plate is 50ft. 6in., and 63ft. 6in. to ridge. The chancel beyond the crossing is groined in stone, the ribs springing from panelled and battlemented springers, and having carved bosses at junction. The height to ceiling of tower lantern is 58ft. 6in.; the ceiling is of oak, panelled, and richly gilt and decorated; this is also the work of Messrs. Shrigley and Hunt. The tower contains a peal of ten bells, the weight of the tenor being 30cwt. These were cast at the Whitechapel Foundry of Messrs. Mears and Stainbank, London. The church is built throughout of Runcorn flecked stone. The roofs are open-timber roofs, of oak, with traceried spandrels and carved bosses. The nave and chancel are covered with stone slates, and the remainder with lead. The aisle passages are flagged; the seat-blocks, morning chapel, and organ transept and vestry floors of oak wood, blocked, and the chancel is laid with various coloured marbles. The steps to sanctuary are of Devon red marble. The principal reredos is of alabaster. The centre portion is divided into three bays by buttressed towers surmounted by canopy tops. The centre panel represents the Crucifixion. Above are a series of three canopies richly sculptured. The side bays have two figures in each, of bishops standing under projecting canopies upon moulded pedestals. Under these panels, and running across the full width of

reredos, is the inscription:—"Per pretiosam mortem et crucem tuam libera nos Domine." Immediately below this, and just above the shelf, are nine panels with delicately-foliated heads. The shelf is carved with groups of foliage and inscription, "Sanctus." The side wings of reredos are canted slightly inwards. They are divided into three bays with open arcade work and moulded coping, the outside bays forming doorways with arched heads and traceried spandrels. Upon the top of these screens, and flanking the sides of centre portion of reredos, are niches with canopies and figures of bishops upon pedestals. The choir-stalls, organ-case, nave seats and dados, morning chapel reredos, altar-rails, and all wood fittings are of oak. The pulpit is of stone and built out from the south-west crossing pier, and joined to the chancel-screen wall. The font, which is placed upon the open floor space at the west end, is of alabaster, with carved bowl of foliage and open arcade round a central shaft; it stands on a platform of Runcorn stone, octagonal on plan and three steps high, with tracery panels cut in the sides. The main altar-rails are of oak, with large turned balusters at intervals and carved top rail, with emblems of the Crucifixion; the smaller balusters filled in between are copper-bronze. The morning-chapel reredos is divided into three bays or panels by wide muntins with tracery-panels; each panel has carved roses cut at intervals round the frame. The central one, containing large carved cross with shield, and standing upon a projecting moulded base, is raised somewhat, with ogee-shaped pediment and carved band of the vine ornament running across full width of reredos. The side panels contain figures of Isaiah and St. John the Baptist standing upon pedestals. Below the moulded shelf is a traceried band. The reredos is placed in the apse of morning chapel, and is continued by a panelled dado round the sides. The altar-rails to chapel are of oak, with carved posts and top rail and turned balusters. The organ-case is richly carved, and is elaborated with figures of angels playing musical instruments; the whole is surmounted by a moulded cornice with deep carved crests and turned posts at main angles. The organ has been built by Messrs. Forster and Andrews, of Hull. The church is heated by hot-water pipes (on the low-pressure system), carried down main aisle in a concreted trench, with grids in floor at intervals. Cold air is admitted from the outside into the trench, and also into the coils in the aisle window recesses behind dado. A line of pipes is carried along each side of the clerestory at the window-sill level, and there are also coils in window sills of east and west windows, thus minimising any chance of draughts. The lighting of the church is by incandescent gaslights. The work has been carried out by the following firms:—Masonry, W. Thornton and Sons, Liverpool; joinery and wood-carving, J. Hatch and Sons, Lancaster; slating, Pickles Bros., Leeds; plumber, glazier, and gasfitter, Braithwaite and Co., Leeds; reredos, font, stone-carving, stone and wood sculpture, M. R. Bridgeman, Lichfield; gas-fittings, Hardman, Powell, and Co., Birmingham. The clerk of the works is Mr. John Hindmarch. The surrounding private roads and grounds, and also the vicarage gardens (the vicarage is in process of erection), have been laid out from plans by Mr. E. H. Milner, A.M.I.C.E., of London. The cost of the church fabric has exceeded £50,000.

## GATESHEAD UNION COTTAGE HOMES.

THE site of these buildings is at Shotley Bridge, near Newcastle-upon-Tyne, and commands a fine view of the surrounding country. Gas and water-mains are in the road fronting the site. The waste-water drainage will be disposed of by irrigation upon the land. Earth-closets are used throughout. The walls are to be built of Tow Law stone—a very hard and close light-coloured local stone; external walls, 18in. thick, internal 9in., and lesser walls of brick. The roofs are covered with New York green Vermont slates. All joinery and fittings are of the best description in deal. The walls of cottages, administrative house, and porter's lodge are plastered internally. The hospital walls are plastered with Adamant, and the wards, lavatories, and bath-rooms of this building have glazed brick dados, all angles rounded, and special rounded skirtings next floors. All the joinery in this building has been specially designed, free from all mouldings of a character to

collect dust, and attention has been given to the internal finishings, and especially to the light and ventilation, while the arrangement of the hospital generally has been planned in accordance with the latest ideas. The drainage scheme has received special attention; patent glazed channeling has been introduced to the manholes, in which the benching and piping are in one. The drainage is arranged so that at a future time the system may be connected with a sewer. The accommodation is for 120 boys and 90 girls in semidetached cottages, three cottages being for boys and three for girls. The cottages consist of living and dining-room, mother's room, kitchen, lavatory and bath-room on ground-floor, and upon the first floor two bedrooms, mother's bedroom, and linen-room. At the rear of the cottages are placed washhouse, e.c.'s, coal, wood, and earth-stores in a detached building. The workshops are for the technical training of the boys in various trades, and are planned and fitted for this purpose. With this group of buildings is placed the general stores for grocery, haberdashery, &c., and in front of this is the superintendent's quarters and office, committee-room, and surgery. The porter's lodge consists of an office and living-room and bedroom over, and out-offices. The hospital is situated upon the highest part of the site, and is planned to be available either for general sick or isolation cases. The probation, or receiving, home for children is situate near the porter's lodge, and has every convenience. It is so placed that children, when admitted, are taken direct to the home without passing any other building, and it has a separate drive to the hospital for the same purpose. The contract drawings and general scheme have been somewhat modified in execution to meet the requirements of the Local Government Board. The number of cottages has been increased, and, exclusive of the receiving home, which has been removed to another site, will cost something like £21,000. Mr. Cecil A. Sharp, A.R.I.B.A., of Newcastle and London, is the architect of this work, which was obtained in competition.

## CHIPS.

The St. Olave Board of Guardians have decided to purchase the land and premises known as Slaygrove Farm, Ladywell, consisting of nearly 35 acres, as a site for a new workhouse, the cost of which is estimated at £180,000.

For many weeks to come Falmouth parish church will be in the hands of builders, who have before them the execution of the first section of an extensive scheme of renovation and repair.

After building houses in Stoke Newington, Mr. A. F. Frampton saw 7ft. of the front of these desirable properties cut off by the London County Council owing to a dispute as to frontage lines, leaving a portion standing (and standing still) practically of no use. To add to his troubles, the vestry summoned him at North London Police-court for £111 7s. apportionment of rates, and the usual order was made.

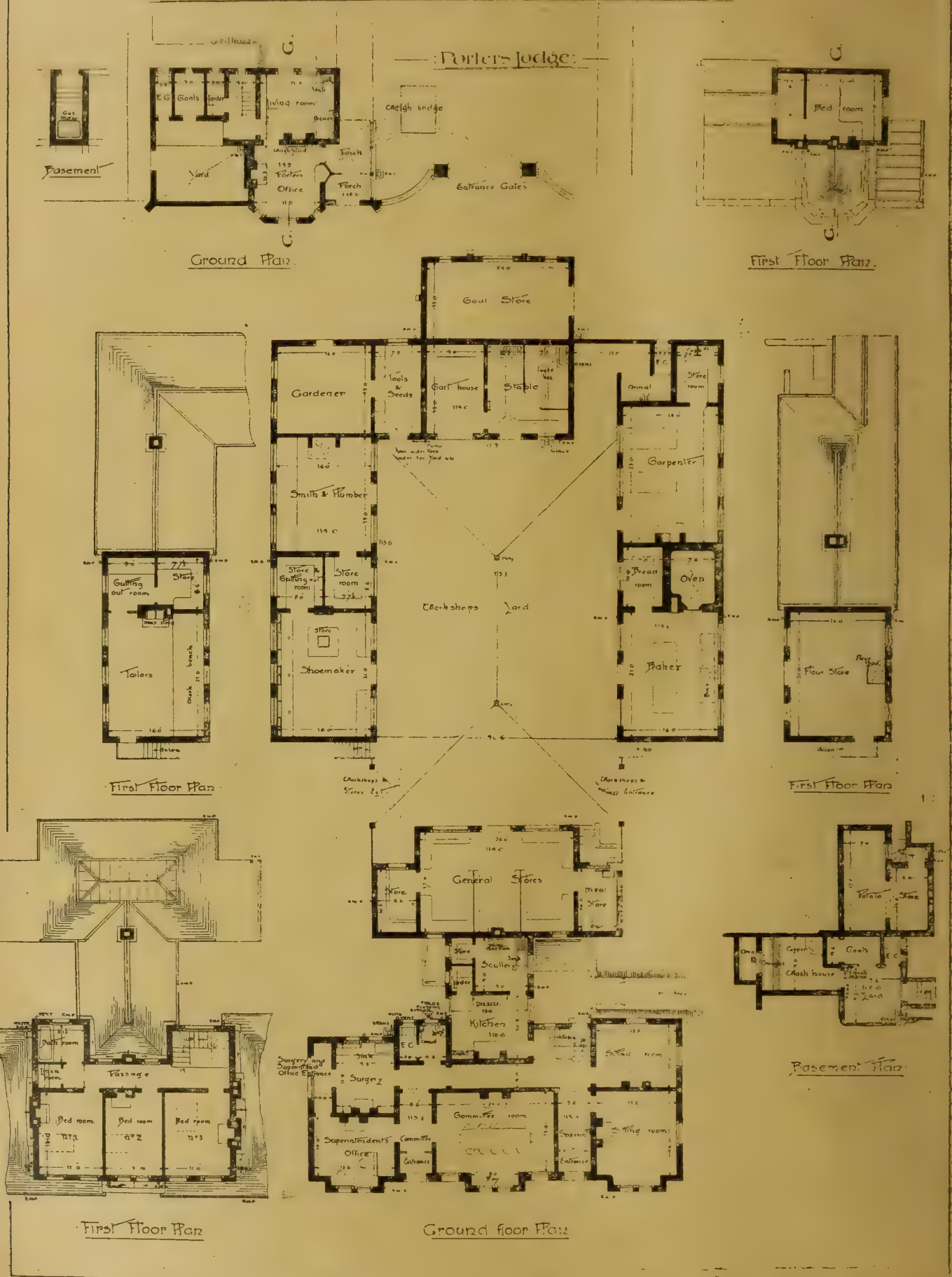
Extensive additions to the Club and Home for Working Girls at 72, Pitt-street, Norwich, were opened on Wednesday week by the Bishop of Thetford. The added buildings consist of a recreation-room, 66ft. long, a dining-room, 30ft. by 16ft., and lavatory and cloak-rooms. The two large apartments are separated by folding-doors, and can be thrown together if necessary. On the first floor there are two dormitories fitted with cubicles, bringing up the sleeping accommodation to 50 beds. An exterior staircase has been provided in case of fire, and the electric light has been fitted throughout. Mr. J. Hurn was the contractor, and Mr. E. Reeve was responsible for the heating apparatus, the whole being carried out under Messrs. E. Boardman and Son, architects, of Norwich.

The west window of the parish church of Newport, Salop, has been filled with stained glass as a memorial. It is the work of Messrs. Burlison and Grylls, of 23, Newman-street, Oxford-street, London, and depicts the earlier scenes of our Lord's earthly life. The four lights portray the appearance of the angel to the shepherds in the fields, and the visit of the wise men to the infant Saviour, the first named filling the two lights on the left, and the second the two on the right. At the apex is the Star of Bethlehem, and in the space beneath an angel holding a shield upon his breast.

Messrs. Strode and Co. have issued a useful and comprehensive illustrated catalogue of illuminations (electric-light and gas) for the Diamond Jubilee. The devices are of all kinds and at all prices, but are all equally characterised by good taste. No firm can be more safely intrusted with such work during the coming festival than Messrs. Strode and Co.



Caledonia Union; Proposed Cottage Homes:













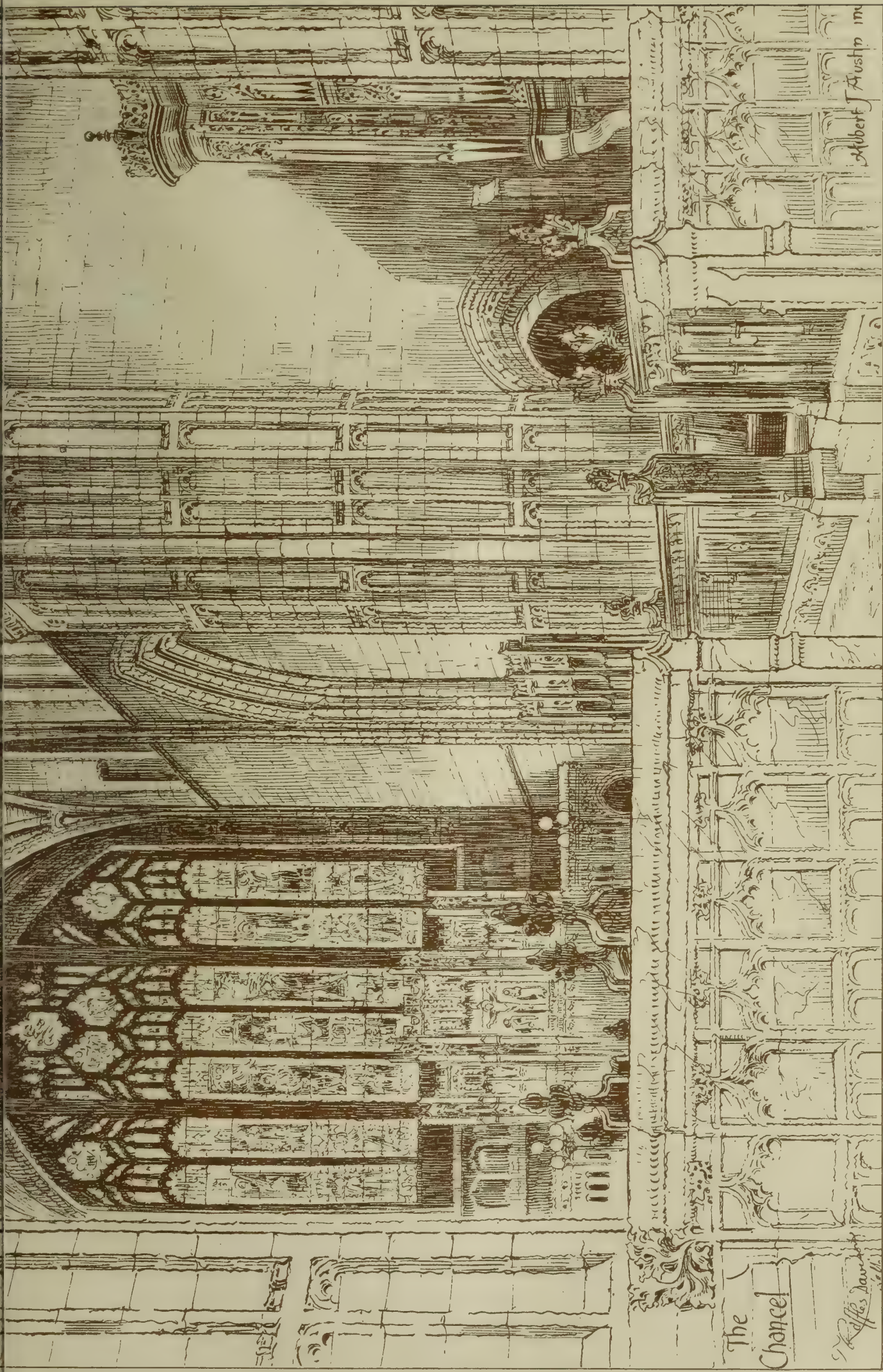


Photo Lithographed & Printed by James Aschman 6 Queen Square W.C.

ST GEORGE'S CHURCH · STOCKPORT · MESSRS AUSTIN & PALEY ARCHTS

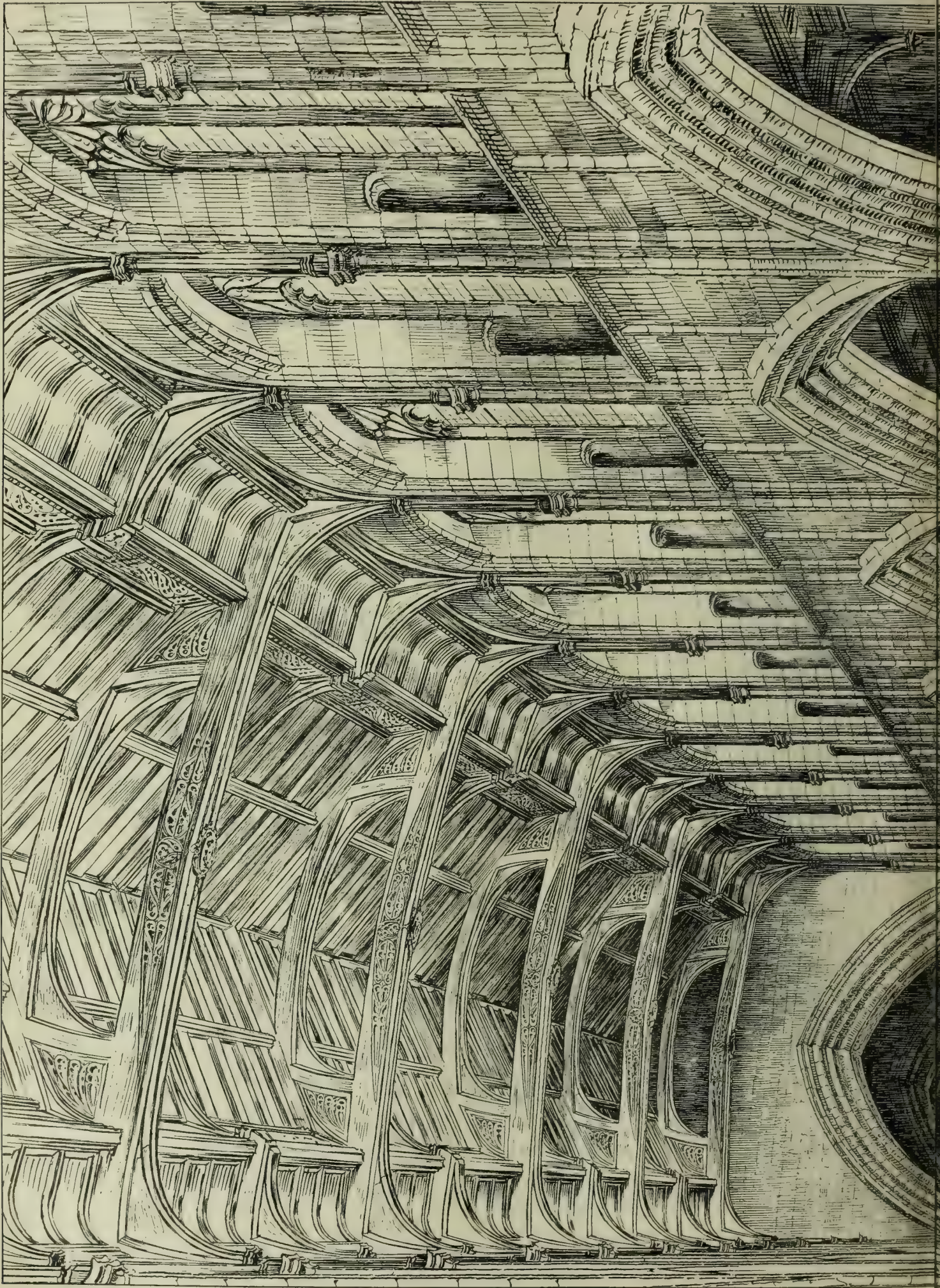




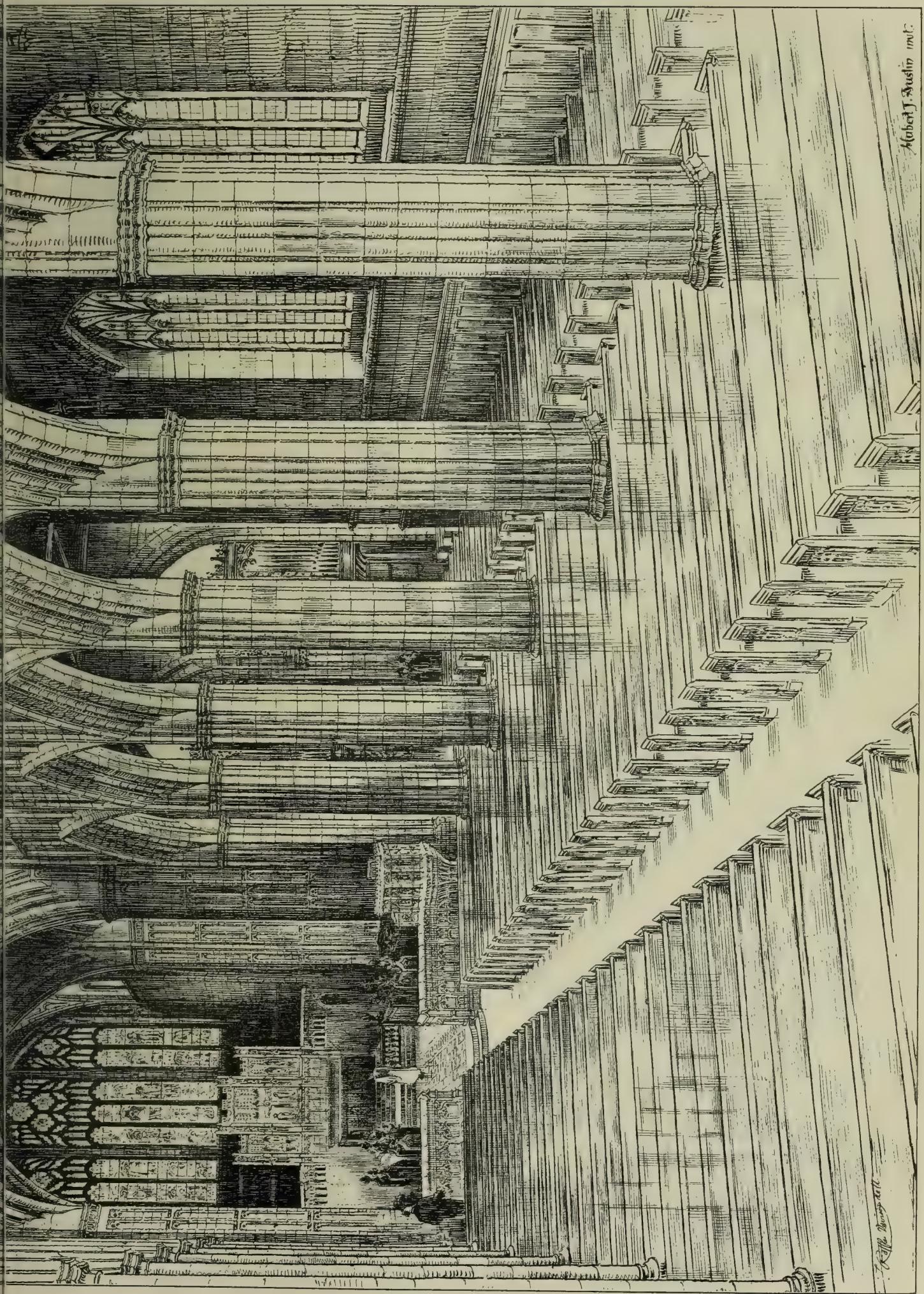












J. R. M. 1871

Robert J. Austin 1871

Interior View Looking East

Messrs Austin & Paley Architects

St George's Church Stockport



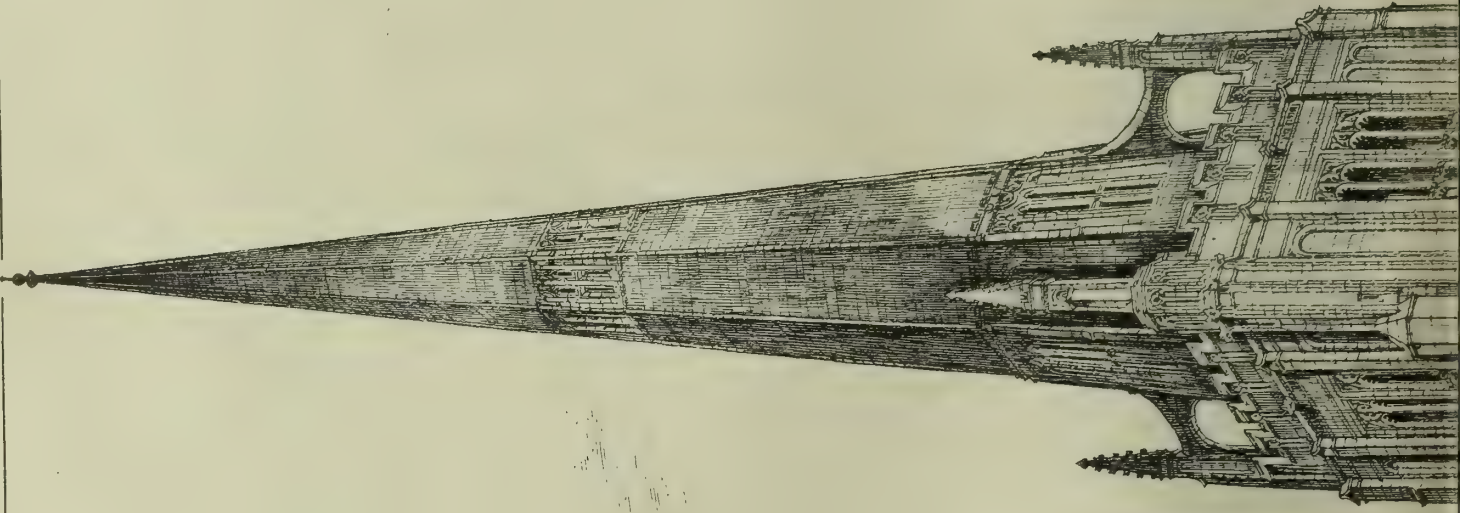




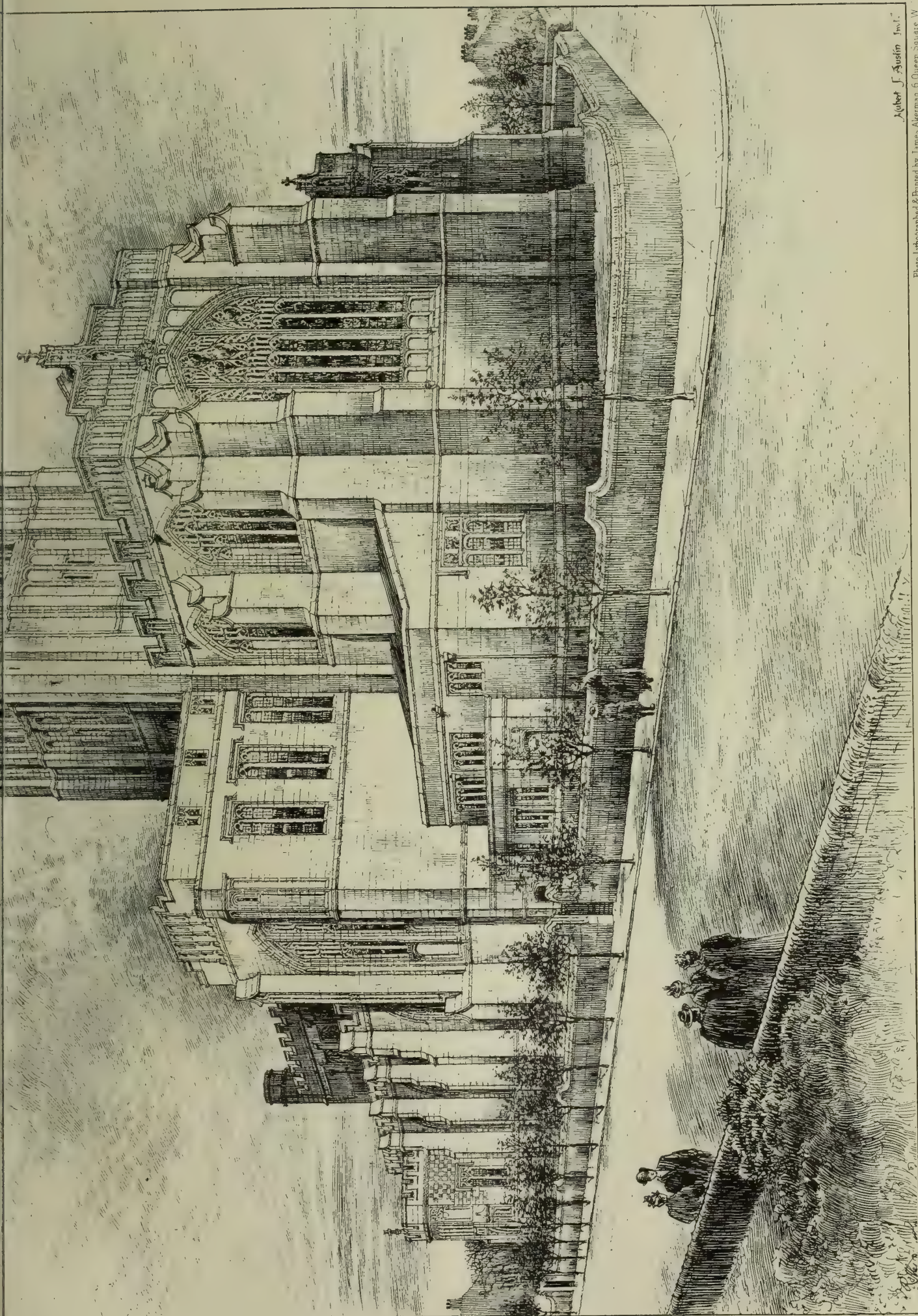




VIEW FROM S.E.







Robert J. Austin, Invt.

Photo Lithographed & Printed by James Alcock, 6 Queen Square, W.

ST GEORGE'S, CHURCH · STOCKPORT · MESSRS AUSTIN & PALEY ARCHT'S

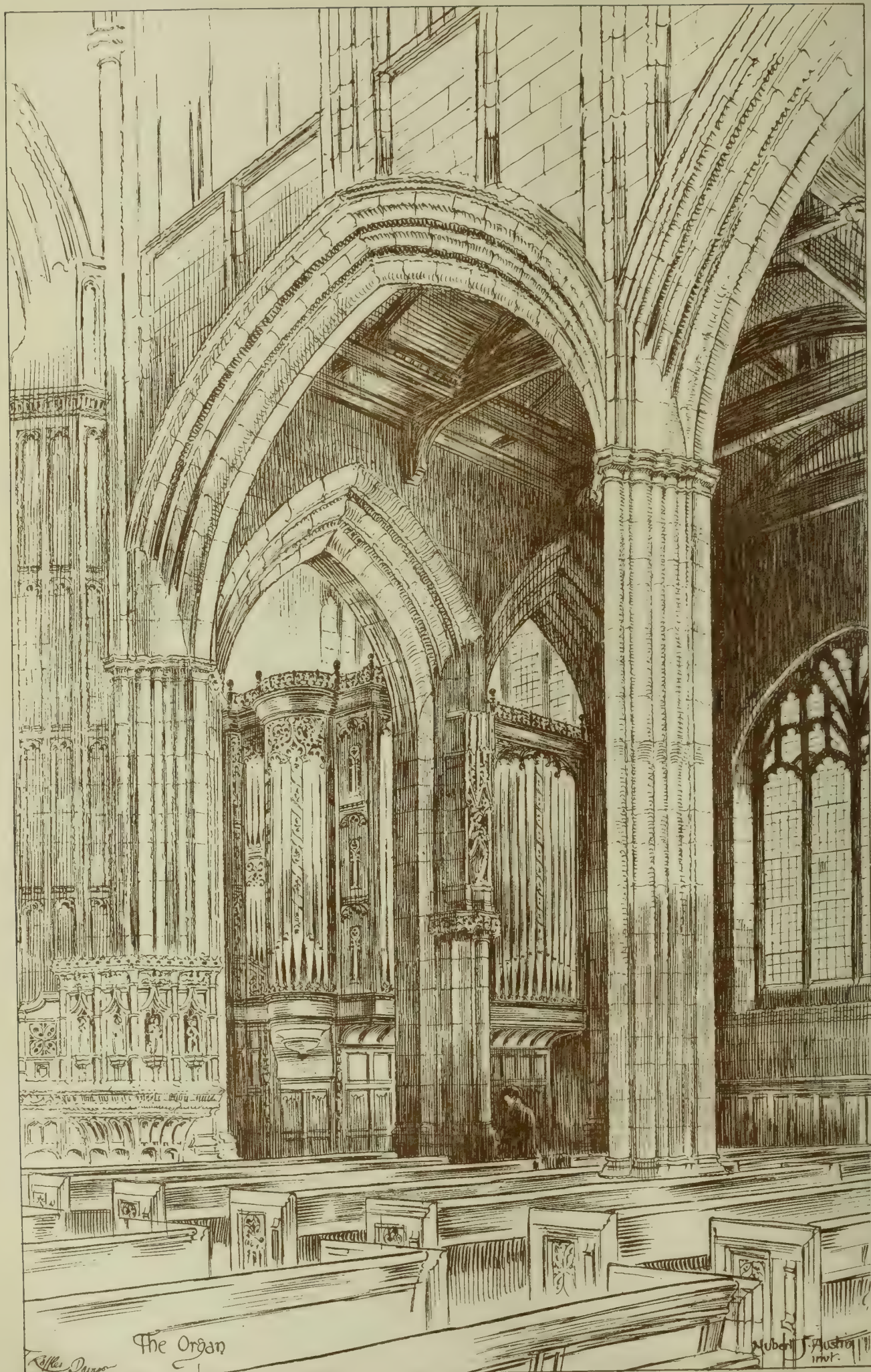










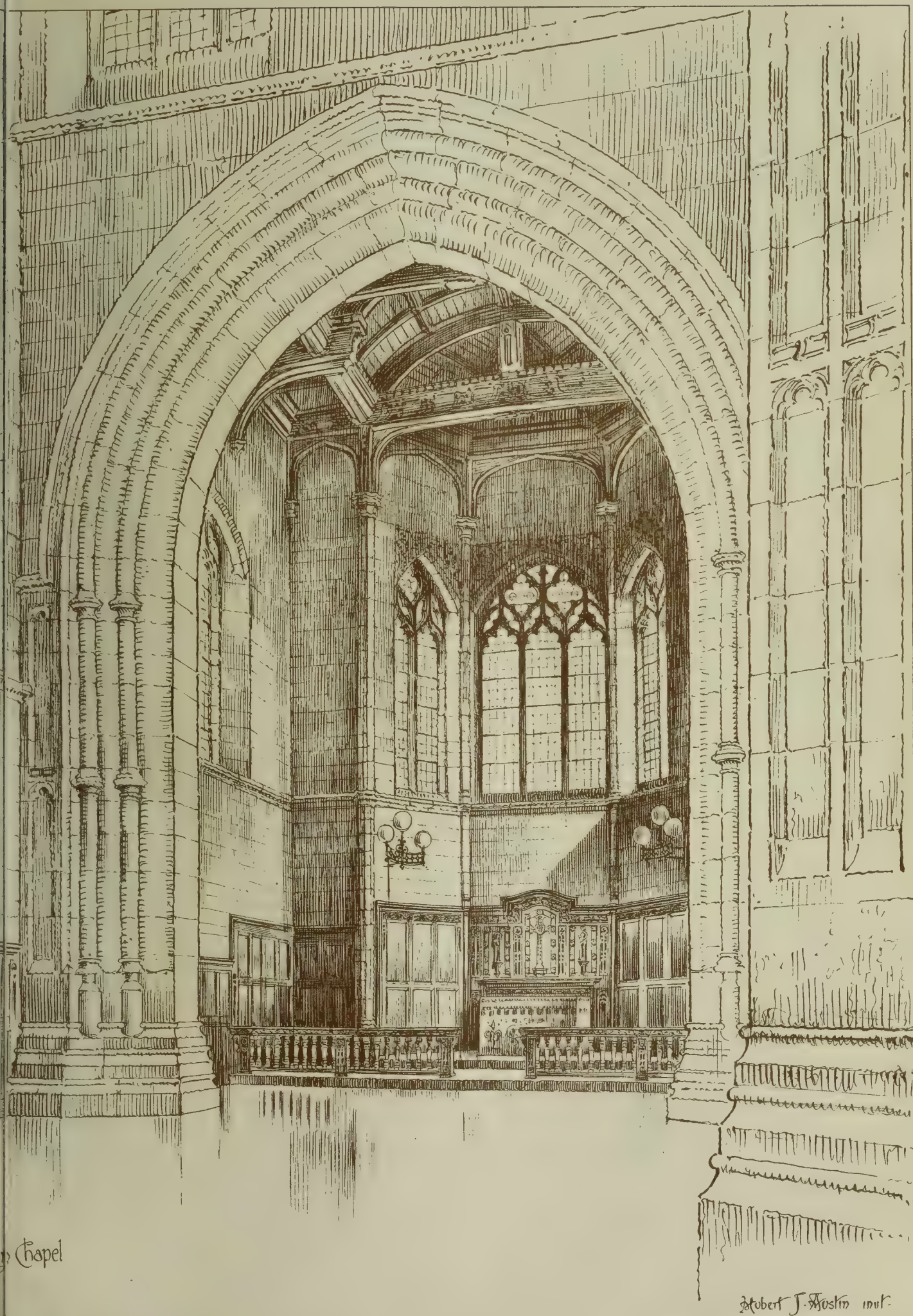


The Mon

18/64



APRIL 30, 1897.



Chapel

Robert J. Austin inv.

Photo Lithographed & Printed by James Akerman 6 Queen Square W

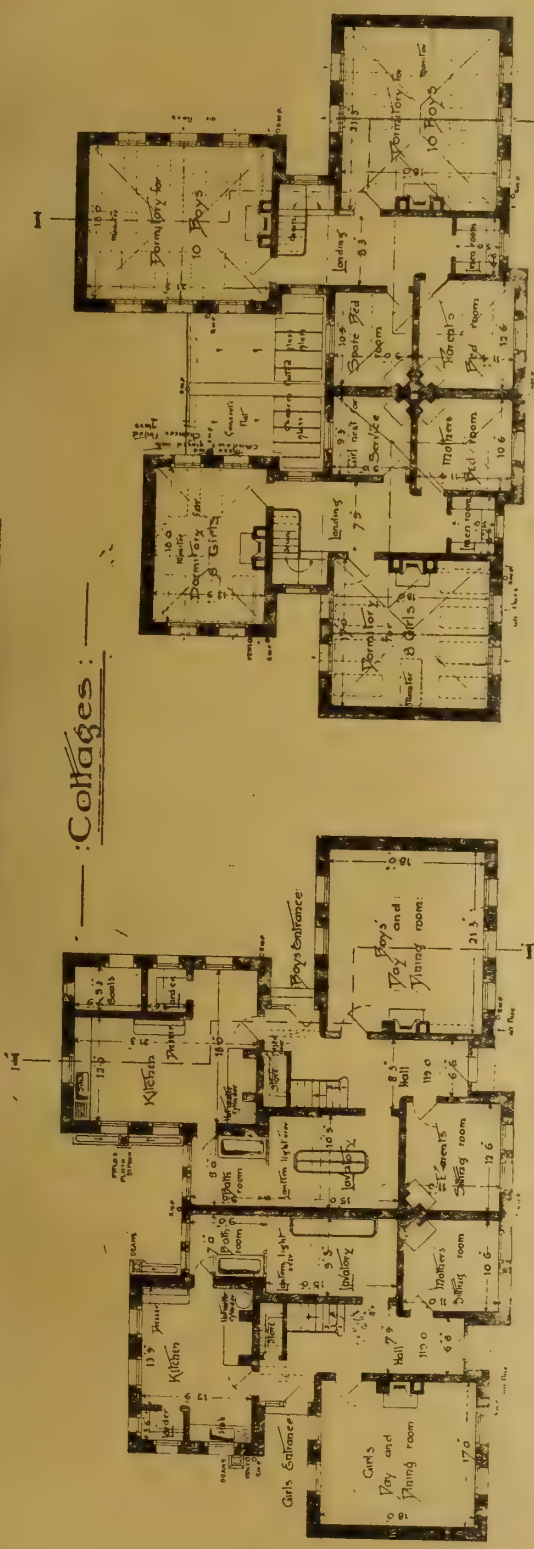
MESSRS AUSTIN & PALEY ARCHTS





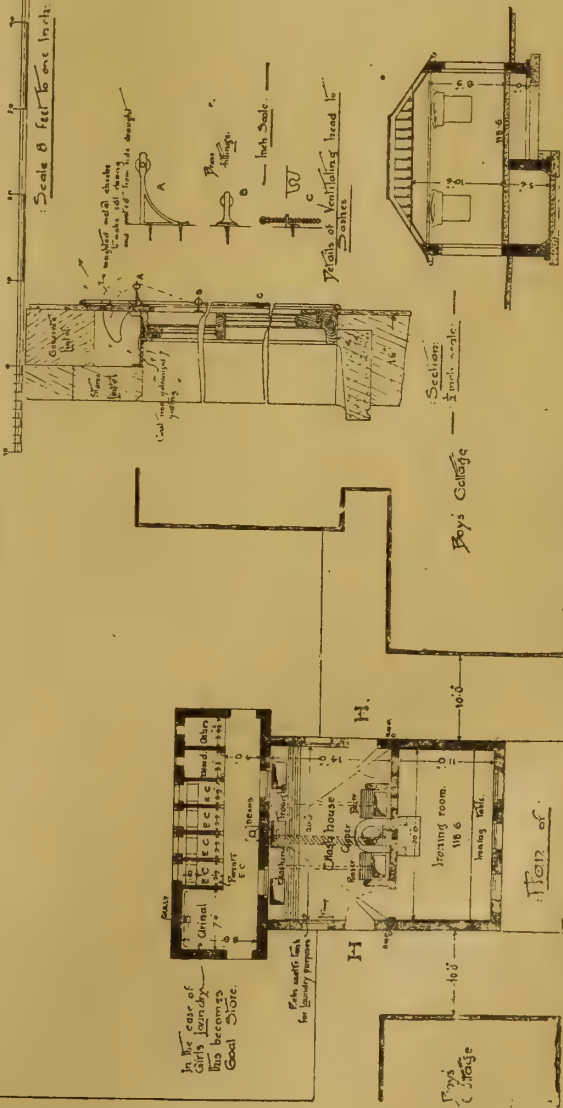


Cafeshead Union: —  
Collage Homes: —



Boys Collage:

Boys Cottage  
Crescent Park:



Boys Laundry:



Section on line H H:

Boys Laundry:

East Albany  
 - Dubuque  
 St. Louis  
 St. Louis



## Engineering Notes.

**ASSOCIATION OF BOROUGH AND MUNICIPAL ENGINEERS.**—The members of the Incorporated Association of Borough and Municipal Engineers held their annual meeting at Dover on Saturday. The president, Mr. F. J. C. May, of Brighton, was supported by a very large number of engineers from various towns and London vestries. Two papers were read by Mr. Stilgoe, Dover borough engineer, on the municipalisation of scavenging and the tramway system just adopted at Dover, the latter being an electric overhead system. The meeting was in complete agreement as to the value of municipal control in such matters. Mr. Walmisley, engineer to the Dover Harbour Board, read a paper on sea defence works. The members were entertained at luncheon by the mayor.

**THE GRAVEHALLS TUNNEL.**—The Gravehalls tunnel, on the Bergen Railway in Norway (says *Engineering*), is the longest tunnel on the North European continent, its length being about 3 miles 1,600ft. Its cost will, however, be unusually low, compared to most other tunnels, which are generally double-railed and bricked to a considerable extent, whilst the Gravehalls tunnel, according to the present arrangements, will not only be for single rails, but even for narrow gauge, and only about 3 per cent. of its length will have to be bricked. The tunnel will only cost some £27 10s. per lineal metre, whereas the usual cost of similar tunnels elsewhere is from £100 to £110 per metre. Both the ends of the tunnel are at an elevation of some 2,900ft. above the level of the sea. The rock has not proved very difficult to handle. The work commenced at the west side, at Opsat, in October, 1895. One hundred and twenty-five men are employed at the west side and 35 at the east side. Barracks have been built for the men at both places, with shops, dairy, laundry, bath-house, &c. According to the experience at Gravehalls, machine-boring does not come any cheaper than hand-boring. The tunnel has to be ready for rails by April 12, 1903. About 14,000ft. will be done from the west end—1,000ft. by hand and 13,000ft. by machine—and some 3,600ft. from the east by hand.

**THE INSTITUTION OF CIVIL ENGINEERS.**—The annual meeting of this institution was held on Tuesday, Mr. J. Wolfe Barry, president, in the chair. The report of the council for the past year stated that the by-laws had been so altered as to supplement the existing regulations by the introduction of a test, by examination of the general and scientific knowledge of candidates for election into the class of associate members. Arrangements have been made to hold a general conference of the institution in London on the 25th, 26th, and 27th of May. During the past year two honorary members, 37 members, 279 associate members, and 14 associates had been elected into the institution, being a total of 332; while by death, resignation, and erasure 158 names had disappeared from the register. The roll now numbered 6,204, as against 6,030 at the corresponding date last year. There were also 886 students attached to the institution, so that the total number borne on the books on the 31st of March was 7,090. The income was £22,285, and £15,417 had been received on capital account to meet the expenditure of the new building. The trust funds had realised £466. The expenditure had been £40,394, of which about one-half represented the normal expenses of the year, the balance being incurred principally in connection with the new building, while the expenditure on Trust Funds account had absorbed £468. Nine supplemental meetings for students had been held during the Session, and six visits to engineering works had been made. The local associations of students at Manchester, Glasgow, Birmingham, Newcastle-on-Tyne, and Leeds continued to do good work. The collection of paintings had been augmented by the presentation, by his son, Mr. Henry Vignoles, of a portrait of the late Mr. C. B. Vignoles, past president. The result of the ballot for the election of Council was declared as follows:—President, Mr. J. Wolfe Barry, F.R.S.; vice-presidents: Mr. W. H. Preece, F.R.S.; Sir Douglas Fox, Mr. James Mansergh, and Sir W. Anderson. Other members of Council: Messrs. Horace Bell, Alex. R. Binnie, T. Forster Brown (Cardiff), Henry Deane (Sydney), W. R. Galbraith, George Graham (Glasgow), J. C.

Hawkshaw, Charles Hawksley, G. H. Hill (Manchester), Dr. John Hopkinson, F.R.S., J. C. Inglis, Dr. Kennedy, F.R.S., John Kenney (Montreal), George Fosbery Lyster (Liverpool), William Matthews, Sir Guildford Molesworth, Sir Andrew Noble (Newcastle), Dr. B. B. Stoney, F.R.S. (Dublin), F. W. Webb (Crewe), Sir William White, and Sir E. Leader Williams (Manchester).

### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**DEVON AND EXETER ARCHITECTURAL SOCIETY:** THREE TOWNS BRANCH.—The annual meeting of the Plymouth, Devonport, and Stonehouse branch of this society was held at Plymouth School of Art, Princess-square, on Thursday evening. Mr. Charles King presided over a good attendance of members. The report was satisfactory, meetings and excursions having been held at regular intervals during the year. The chairman, in his address, expressed the hope that the members would make the coming session even more satisfactory, and impressed on all the desirability of an esprit-de-corps among the members of the profession. The ballot for the election of officers resulted as follows:—Chairman, Mr. C. King (re-elected); committee, Messrs. H. G. Luff, M. A. Bazeley, B. P. Shires, J. H. Dwyer (re-elected), and A. G. Bewes; hon. secretary and treasurer, Edgar M. Leest (re-elected). Votes of thanks were accorded the retiring officers, on the motion of Messrs. Shires and Bazeley.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—At an ordinary meeting of the Edinburgh Architectural Association, held on April 21st in the Royal Institution—Dr. R. Rowand Anderson, president, in the chair—a large number of drawings of old Scottish work by students of the Applied Art School were exhibited, and explanatory historical and architectural notes on them were read by Mr. J. Forbes Smith and Mr. Ramsay Traquair, students. Among the subjects of the drawings were Holyrood Abbey, Craigmillar Castle, Argyll's Lodging at Stirling, and Cowane's Hospital. The chairman, in proposing a vote of thanks to Messrs. Ramsay Traquair and Forbes Smith for their communications, said that the Association, in devoting one of its evenings to an exhibition of the work of the students of the Applied Art School, was desirous to make it known, especially to the young men who were to follow applied art, that the Association was doing its best for them, because it made annually a handsome subscription from its limited means to forward the cause of education, and it desired to make it known that it did not limit its subscription to benefiting those only who were to follow architecture, but that it gave its support to a school which, in carrying out its system of education, made no distinction between the architect and all other art workers—that was to say, that the scholarships and other rewards at the disposal of the school could be obtained and held by the decorator, the sculptor, and any other art worker equally with the architect. The Association also desired to emphasise the great importance of the study of ancient work, in all its departments, as a true foundation for the future work of the artist. Work of the character they saw that night might be described as analogous to anatomy in the study of medicine. They brought the student into actual contact with work of all kinds. He was taught to dissect, to analyse, and to work out for himself all the reasons that gave rise to the various features he saw in buildings. All artists of eminence had recognised that the study and analysis of ancient work were among the most important factors in the education of all art workers, and the Association desired to make it known as widely as possible that the Applied Art School held out every inducement to students, within its, he was sorry to say, somewhat limited means, to come and perfect their education. The members of the Association visited on Saturday afternoon Bavelaw Castle, near Balerno. Mr. Frank W. Simon, architect, who led the party, described the castle; and Mr. Glover, factor for the property, supplemented Mr. Simon's description.

**THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.**—The undernoted buildings have been visited on the past five Saturday afternoons by the students attending Prof. Gourlay's classes in architecture and building construction: A new brick-kiln of the Hoffman type at

Seedhill, near Paisley; Mr. R. W. Forsyth's new warehouse, Renfield-street, Glasgow, by Mr. John James Burnet, architect, Glasgow; Miss Cranston's new restaurant, Buchanan-street, Glasgow, by Mr. George Washington Browne, architect, of Edinburgh; Langside-road United Presbyterian Church, Glasgow, by Mr. John B. Wilson, architect, Glasgow; the new art galleries and museum, Kelvingrove Park, Glasgow, by Messrs. Simpson and Milner-Allen, architects, of London. There was a good attendance at all these visits.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—The members of this association on Saturday afternoon visited Messrs. Wm. Harriman and Co.'s works, Blaydon. Mr. W. H. Allen, the managing director, and Mr. J. Jenkins, one of the directors, conducted the party over the works, and explained the numerous processes of manufacture. Mr. Allen also read a paper on "Fire-Clay Manufactures." A hearty vote of thanks was afterwards passed to Mr. Allen. It was mentioned that the works were founded in 1844, and that they now employ 100 to 120 men, and cover an area of an acre and a half. The visitors were provided with tea.

### CHIPS.

Mr. M. S. Patton, an architect of Chattanooga, Tenn., lost his life on April 3 in a fire which destroyed the office buildings in which he had chambers.

Carved oak casing has just been added to the northern portion of the organ in Westminster Abbey. It has been executed by Messrs. Shillitoe and Son, of Bury St. Edmunds, from designs by Mr. J. L. Pearson, R.A., the architect to the Dean and Chapter.

The Prince of Wales has fixed Friday, the 28th of May, for the ceremony of laying the foundation-stone of the new buildings of the Royal London Ophthalmic Hospital, Moorfields.

An inspector of the Local Government Board attended at Blackpool on Friday to inquire into an application for sanction to borrow £10,000 for the extension of the gas works and other municipal purposes. The town clerk said the population of Blackpool at the last census was 23,846, and at the present time it was estimated to have increased to 40,000. It was now sought to spend about £10,000 on new mains, meters, and lamps. Application for other money was made for a proposed underground convenience in Station-road, South Shore, and for street improvements in different parts of the town.

The east end of Penybont Church, Radnorshire, has been enriched with a stained glass window in the centre light of which is depicted the "Crucifixion," and in the two sides "The Light of the World" and "The Good Shepherd" respectively, with corresponding emblems in the tracery. The work is from the studio of Messrs. Jones and Willis, of Birmingham and London.

The Free High Church, Edinburgh, besides having its interior entirely repainted and re-decorated, has just had introduced into it a new pipe-organ, a new pulpit, and Communion-table, together with an installation of the electric light. The organ has been built by Messrs. H. S. Vincent and Co., Sunderland. The instrument has been inclosed in a case designed by Mr. Henry F. Kerr, architect, in a style to harmonise with the interior of the building, and made of oak like the pulpit and Communion-table. The principal feature of the electric-lighting installation is an 18-light electrolier that depends from the centre of the roof. The whole scheme has cost about £1,500. Reopening services took place on Sunday.

Two new stained-glass windows have been recently erected in Deene parish church, near Peterborough, to the memory of the late rector, the Rev. Edward T. Sylvester. The windows, which were executed by Messrs. Burlison and Grylls, of London, after designs by Mr. G. F. Bodley, R.A., are placed in the north aisle next to the vestry. Four Latin fathers are represented, two in each window—viz., St. Gregory, St. Jerome, St. Ambrose, and St. Augustine. The two quatrefoils in the head of the windows are filled with shields bearing sacred monograms. The lower part of each light bears one of the evangelistic symbols—viz., SS. Matthew, Mark, Luke, and John. The colours are chiefly sapphire-blue and ruby reds.

Messrs. Partridge and Cooper will shortly publish a charmingly illustrated souvenir of the Queen's Diamond Jubilee, entitled "Temple Bar and State Pageants," an historical record of State Processions to the City of London, and of the quaint ceremonies connected therewith, written by Henry Johnson, and illustrated with pen-and-ink sketches by Elsie M. Cluff. The illustrations will include reproductions of several interesting engravings from originals in the British Museum.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—S. C. F.—G. T. W.—A. O. A. C.—S. L. and SON.—C. A. O.—F. G. CO.

## Correspondence.

## R.I.B.A. ELECTIONS.

To the Editor of the BUILDING NEWS.

SIR,—A doubt has been expressed as to the accuracy of my statement that a large proportion of the members do not vote at the annual elections for the Council. The following are the actual figures taken from the Institute Journal in reference to the last election. There were only 468 envelopes containing the voting papers, and of these 29 were spoiled by informality; the greatest number of votes given for one member was 391. As the total number of members with voting power was then 1,581, it is clear that no less than 1,113 of them neglected or refused to send in their papers.

It is to be hoped that there will be more voters this year, and that they will consider that the new council should have at least six new members, and that six of the existing members should retire for a period. The best way of securing this result would obviously be to "plump" for new candidates only, for it is certain that twelve existing members must in any event be returned.

A METROPOLITAN ARCHITECT.

London, April 28.

SIR,—The fact that 60 existing members (out of 64) have nominated themselves for the standing committees should be widely known. The best thing to be done under the circumstances will be to "plump" for new candidates, as, in any case, a large proportion of existing members must necessarily be returned.

As 17 of the existing council are renominated for 18 seats, it is desirable that all members vote, and for new men only. The existing 17 members

will, no doubt, be well looked after by their own friends, and, as they have renominated themselves, will probably also vote for each other; but a few of them should make place for new blood.—I am, &c.,

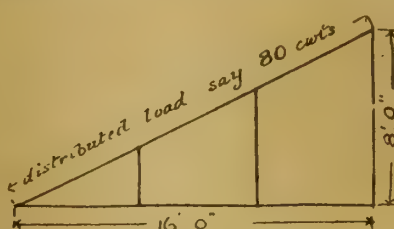
A LONDON ASSOCIATE.

## Intercommunication.

## QUESTIONS.

[11655].—Wood Mouldings.—Will any reader kindly inform me of some book giving details of wood mouldings for doors, windows, &c., and also for ceiling cornices, and where published?—CONSTANT READER.

[11656].—Temporary Stands.—In view of the approaching Jubilee procession, perhaps the following questions will be of general interest. The stands I am concerned with are temporary erections on a racecourse. I wish to know (speaking from the point of view of a surveyor, who has to certify as to the safety of the stands)—(1) What is a proper load per foot super. to assume as the basis of calculations? (2) Should this be considered as a live or dead load? (3) Should the factor of safety employed differ in any respect from the usual factor for permanent structures? And if so, to what extent? Surveyors who have had experience in inspecting such erections have probably found a very small margin left between the anticipated load and the strength of the parts, and acting in such a case myself—without making unreasonable demands on the stand-holder—I naturally



want to be on the safe side. (4) What would be the actual difference as to stability between the two trussed bearers sketched below, assuming the same scantlings be used for the respective parts in each case? I take it that with the vertical struts the weak place would be the joints. How can the strength of the joint be estimated?—INQUIRER.

## REPLIES.

[11654].—Sewerage.—The most recent work on sewerage and sewage disposal for all sizes of towns and villages is one by E. Bailey Denton, M.Inst.C.E., of which the publishers are Messrs. E. and F. N. Spon, of 125, Strand, W.C. If "C.E." calls on Messrs. Spon, they will tell him directly the most modern and best work on house drainage. The author above referred to has written a work on this subject, but I believe it is out of print.—WESTMINSTER.

The Norfolk County Council have received a report from the Western Highways Committee recommending that the Magdalen bridge over the river Ouse be reconstructed as a single arch in iron, at an estimated cost of £6,000.

The Heywood Literary Society has just lost by death one of its founders and most active members in Mr. Emanuel Edward Oldridge, joiner and cabinet maker, Pine-street, who died on the 15th April, in his 68th year. At his own trade he was a skilful workman, but he was more widely known as an antiquary. Some years ago he published a series of articles on the history of Langley Hall, which attracted great attention, and more recently he was energetically interested in the effort to preserve for public use Hopwood Hall footpath.

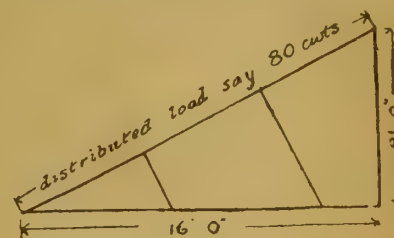
There are at the present time, either in actual working, in process of construction, authorised by Parliament, or projected, 36½ miles of underground electric railways in London. This length does not include any of the underground lines worked by steam. The following is a complete list of all electric lines, made and projected, which it is proposed to construct in the Metropolis:—City and South London (working), 6½ miles; Waterloo and City (nearly completed), 1½; Central London Railway (under construction), 5½; Charing Cross, Euston, and Hampstead (authorised), 5; Great Northern and City (authorised), 3½; Baker-street and Waterloo (authorised), 3; Brompton and Piccadilly-circus (authorised), 2; District Railway Deep Level (projected), 4½; Whitechapel and Bow (projected), 2; Borough and Islington (part under construction and part authorised), 3.

Colonel Durnford, Government inspector, held an inquiry at Barnton, Northwich, on Saturday, respecting the application of the Northwich Rural Council for sanction to borrow £1,659 for the reconstruction of the road between Northwich and Runcorn preparatory to its transference to the county council. The road is regarded by cyclists and drivers as the worst stretch in Cheshire. It will now be made like the other county roads.

## LEGAL INTELLIGENCE.

RE GEORGE HENRY WILKINS, 48, THOMAS-STREET, BRISTOL, BUILDER AND CONTRACTOR.—This case was heard at the Bristol Bankruptcy Court on Friday. Debtor, in reply to the Official Receiver, said he commenced business with £250 capital lent him by his father. He took contracts, and all went well until he obtained two contracts which turned out unfortunate. He had estimated his loss on the Portishead sewage works at upwards of £2,000. He called a meeting of his creditors, and that led to a stoppage of contracts. But it might all be referred to the Portishead contract. He had given a relative a charge on the result of two contracts to cover liability at the bank. By Mr. Barry: Prior to the private meeting he had asked creditors to renew bills. The result of the meeting was the stoppage of a contract at Gloucester, which would have been profitable if he had been able to complete it. The greater portion of the furniture at his house was claimed by his wife. By Mr. Taylor: The Portishead Council applied for an injunction on the same day as the meeting of creditors, and that complicated matters. The examination was adjourned to May 7.

IN RE W. J. CHINCHEN.—At the Poole Bankruptcy Court on Wednesday week, before Mr. H. Salter Dickinson (Registrar), William James Chinchén, builder and contractor, of East Cliff Works, St. John's Wood-road, Bournemouth, came



up for his public examination. The statement of affairs showed gross liabilities amounting to £8,035 5s. 4d., of which £7,265 is expected to rank for dividend. The assets are estimated to produce £4,150 1s. 11d., leaving a deficiency of £3,115 1s. 2d. Debtor stated that previous to his coming to Bournemouth he was manager at his father's works. He started business on his own account in Bournemouth about five years ago with a capital in private cash of about £20, but he received between £3,000 and £4,000 from his friends. He had had previous experience in the building trade, having been practically born into it. When he first commenced business at Bournemouth he did jobbing work for Messrs. Lawson and Donkin, and he also took several contracts under them. He continued in this way for about two years, and made close on £1,000 profit. For the first three years he superintended the business himself, but after that he engaged a manager, whom he paid at first 45s. a week, and then raised it to £3. On the contract at the Christchurch Union, debtor stated he lost between £1,500 and £2,000. Mr. Fry pointed out to the debtor that he was overdrawn at the bank on April 1, 1896, to the extent of £3,300, and asked him what he owed to other creditors at that time, but he replied that he could not say. Debtor was allowed to pass his examination.

At the Jubilee commemoration banquet of the Architectural Association, to be held at the Trocadero Restaurant on Wednesday next, the president, Mr. Beresford Pite, will occupy the chair, and will be supported by almost all the surviving past presidents. The guests will include the Lord Chief Justice, the Bishop of London, and Viscount Halifax.

On Friday night, shortly after 10 o'clock, a fire occurred on the premises of Mr. G. R. Edwards, builder, Monnow-street, Monmouth, in the workshops and sheds and destroyed a furniture store. The damage is estimated at about £700.

At a general meeting of the Royal Society of Painters in Water-Colours, held on Monday, Messrs. Napier Hemy, Sam'l. G. Evans, J. Henry Henshall, and J. R. Weguelin were elected members.

The opening, under the auspices of the Liverpool Branch of the Church of England Society for Waifs and Strays, of the Victoria Home for Infants, Formby, near Liverpool, on Saturday, celebrated the record reign. The home, a plain building in Andrew's-lane, a little on the sea side of the railway station, has been erected from the plans of and superintended by Mr. J. Havelock Sutton, of Liverpool and Formby, the contract being executed by Messrs. J. and G. Chappell, of Walton Village. At an inclusive cost of about £2,000, beds have been provided for 30 children and the necessary staff, besides which there is a small hospital wing.



## WATER SUPPLY AND SANITARY MATTERS.

**COVENTRY.**—Prior to his recent lamented death, Dr. Mark Fenton, Coventry's medical officer of health, had completed his twenty-second annual report, which was presented to the city council on Tuesday. In it the doctor states that the year had been one of unexampled prosperity to all employed in the cycle and allied industries. The artisan class found employment abundant and wages good, though much overcrowding arose owing to the limited house accommodation existing. There had been a diminution in the amount of pauperism. Plans for the construction of 21 new streets and 548 dwelling-houses had been passed. Plans had been approved and a loan sanctioned for the extension of the City Hospital, for the erection of a small-pox hospital at Pinley, and of a portion of the new municipal buildings. The population was set down at 59,151, the density of population 18'55 per acre, and the ratable value at £187,116, as compared with £103,920 in 1875. Under the Housing of the Working Classes Act, 1890, there had been 13 houses condemned as unfit, and dealt with. The doctor had reported to the sanitary committee the existence of 1,122 back-to-back houses in the city, and 1,924 with light and ventilation from one side only. Since November, the city had, through the thorough completion of the new Whitley Waterworks, received an abundant supply of water. No progress had been made towards the erection of the much-desired refuse-destructors. The report of the sanitary inspector (Mr. W. H. Clarke) shows a very considerable amount of labour accomplished, 12,120 premises having been visited.

**WORTHING.**—The new system of water supply constructed for the town council was formally opened by the Duke of Cambridge on Monday last. The water is drawn from a well at the foot of the South Downs. The new works are situated about two miles north of the town, and with the pumping station and reservoir cover about three and a half acres of ground, the reservoir standing further northward on the chalk soil itself, the excavation for that purpose amounting to no less than 12,000 loads. The capacity of the reservoir is about 2,000,000 gal., the requirements being on the average about 750,000 gal. per day. The walls are constructed of layers of concrete asphalt and very hard brick. The engines to be used alternately are each of about 87 H.P., and each engine and set of pumps is capable of raising a thousand gallons of water a minute to a height of 215 ft. Every possible precaution has been taken to secure the water in the well against contamination. The shaft of 119 ft. is cased with flanged iron shields in segments, the joints being made of pitch pine vertically and of yarn and Russian tallow horizontally, headings having been provided to increase the supply 150 ft. in length, 6 ft. high, and 4 ft. wide. The water is somewhat hard, the analytical reports showing a total hardness of 16'5°, of which three-fourths are removable on boiling. The works of supply have been carried out from plans by, and under the supervision of, Mr. James Mansergh, M.Inst.C.E., of Westminster. With the expenditure upon the present scheme the corporation has incurred, within the past few years, an outlay in excess of £100,000 in restoring the sanitary condition of the borough.

## CHIPS.

The inhabitants of Stoke Poges (Bucks) have decided to commemorate the Queen's long reign by restoring their parish church, rendered famous by the Elegy of the poet Gray. It is proposed to reface the tower with oak shingles, and to renovate the interior of the building.

The large refreshment room in the old mansion in Brockwell Park which looks out towards the railway has been beautified by a series of five pastoral scenes painted in oils by Mr. Henry Strachey, of Stowey, Somerset, and presented by him to the London County Council as custodians of the park for the people.

Professor Herkomer, R.A., has promised to paint the portrait of Principal T. Charles Edwards, D.D., which is to be placed in the University College at Aberystwith.

The vestry of St. Martin-in-the-Fields have approved of plans by Mr. W. G. Sprague, architect, of Arundel-street, Strand, for a theatre proposed to be erected in St. Martin's-court, Charing Cross-road, for Mr. Wyndham. The building is to hold an audience of 1,500 people. The façade of 80 ft. to Charing Cross-road will be Greek in style, and will be faced with stone.

At Bristol, on Friday, Charles Francis Ball, assistant surveyor, and Isaac Pearce, inspector, were charged with conspiring to steal by means of fictitious wages sheets various sums of money belonging to the corporation of Bristol. At the last hearing the sums alleged to have been stolen by Ball amounted to about £2,000. The magistrates' clerk said that amount was now increased to £2,600, while in Pearce's case the amount was about £130.

## Our Office Table.

DURING the past fortnight the high and unsightly brick wall which shut out Devonshire House from view in Piccadilly has been in course of removal, and on Monday morning the first portion of the famous wrought-iron gates, which have been removed from Chiswick House, was re-erected in front of the duke's mansion in Piccadilly, where they effect a striking improvement. These gates were originally the property of Lord Heathfield, and stood at the entrance of his residence at Turnham Green. When the estate was broken up in 1837 the then Duke of Devonshire secured the gates for his place at Chiswick. They took the place of a much older gate, which was re-erected in the fine old grounds surrounding Chiswick House, and which bears the following inscription: "Built by Inigo Jones, at Chelsea, MDCXXI," and "Given by Sir Hans Sloane, Baronet, to the Earl of Burlington, MDCXXXVII."

A SPECIAL general meeting of the Arts Club of Edinburgh was held on Friday night to consider the proposal put forward by the special committee of the town council to acquire the north side of South Charlotte-square, in whole or in part, as a site for the Usher Hall. Professor Baldwin Brown occupied the chair, and there was a large attendance of members. After a long discussion a motion, proposed by Mr. W. D. McKay, R.S.A., and seconded by Rev. H. Mackenzie Campbell, was carried (with only three dissentients) to the effect—"That this meeting, while sympathising with the town council in the great difficulties attending the selection of a site for the Usher Hall, is of opinion that the destruction or modification of the whole or part of the north block of houses in Charlotte-square, for the sake of securing a site, would inflict irreparable injury on one of the best architectural features of the city. Further, this meeting appeals to the proprietors of the square to preserve from injury the noble design of the buildings over which they have control." It was remitted to the council of the club to take any steps necessary in the future to bring the views of the club before the town council.

At the monthly committee meeting of the Builders' Clerks' Benevolent Institution (of which Mr. Thomas Hall, of the firm of Messrs. Hall, Boddall, and Co., the successors to Messrs. Lawrence and Sons, is president at the present time), reference was made in feeling terms to the death of Sir William Lawrence, the first president of the Institution, and the committee unanimously decided to instruct their secretary, Mr. H. J. Wheatley, to write to the surviving members of the family, expressing their sincere regret for and deep sympathy with them in the great loss sustained. "To the late Sir William," Mr. Wheatley's letter continued, "this Institution is very deeply indebted indeed, as to his personal encouragement and great influence must be attributed the striking success resulting from the original effort made. Such services were at the time, and continue to be, very highly appreciated."

A PETITION has been deposited at the House of Commons for leave to bring in a Bill authorising the extension of the Victoria Embankment as far as Lambeth Bridge, and various extensive improvements in the parishes of St. Margaret and St. John, Westminster. The proposed improvements will involve the clearance of an area 27 acres in extent, and the cost of the acquisition and clearance of the site is estimated at upwards of £1,000,000 sterling. The proposals include the formation of a wide approach or avenue from Horseferry-road to the Victoria Tower, forming a connection with the approaches to the new Lambeth Bridge; the widening of a street so as to make a connection between Great Smith-street and Horseferry-road and a street opening out of the church of St. John, Westminster; the formation of a square of the size of Hanover-square, in front of the Church-house buildings, Great Smith-street; and the removal of the whole of the insanitary area and slums of Westminster, and the construction upon the site of large buildings more or less of a public character.

The new Corporation Museum at Halifax was formally opened on Saturday afternoon by the Mayor. For many years the Halifax Literary and Philosophical Society have had a valuable

collection of geological, botanical, and other specimens at their premises in Harrison-road, and the public have been allowed to inspect them for a nominal payment. Very few people, however, have visited the institution in recent years. The cost of upholding the museum has been a burden on the society, and difficulty has been experienced in providing accommodation for fresh specimens. These facts led to the transference of the curiosities to the corporation. The specimens have been removed to Belle Vue Mansion, a large building which also affords accommodation for the Free Library and Public Reading Room. The cost of removal and providing new cases, &c., has been about £500. The museum, apart from its educational value, is estimated to have a money value of some £2,000. There is a collection of old coins which could easily be sold for £500. A museum which is being provided for another portion of the town will also be thrown open to the public during the summer.

The select committee of the Legislature of Canada to whom was referred the Bill to amend the Ontario Architects' Act, have reported thereon as follows:—"The committee have carefully considered the Bill to them referred, and having heard the opinions of several persons for and against the Bill, feel compelled to report against its provisions. Several suggestions were made by way of amendment to the Bill, looking towards elevating the educational standards of the architects' profession without increasing the present powers of exclusion, and looking rather to an adoption by collegiate or Governmental machinery of a curriculum and examination for admission. The committee desires to express no opinion on these subjects, deeming the session to be too far advanced for their proper treatment, but prefer to leave the whole subject, so far as the educational side is concerned, wholly unprejudiced by the present action of the committee, which has relation only to the Bill as it stands." It is possible, says the *Canadian Architect*, that the Government may see fit to submit a measure of this character at the next session of the Legislature; but there is at present no foundation for a definite statement as to future action on the part of anybody in the direction of endeavouring to improve the educational standards of the coming generations of architects. The Ontario Association of Architects have certainly laboured long and earnestly for this object, and earned the thanks of the students, whose welfare was the mainspring of their efforts.

The half-yearly conference of the National Association of Slate Merchants and Slaters will be held at the Crown Hotel, Clayton-street West, Newcastle-on-Tyne, on Tuesday and Wednesday in next week. On the first day the members will meet at 11 a.m., when Mr. A. B. Partridge, the president, will deliver his address, and a conference will be opened, to be continued in the afternoon. In the evening a smoking concert, arranged by the North of England branch, will be held in the large room of the Crown hotel. On Wednesday the members will assemble for a drive round the city, and will afterwards embark on the s.s. *J. C. Stevenson* (granted by the Tyne Improvement Commissioners) at the Newcastle Quay for a trip on the river from Elswick to Tynemouth, where they will land and proceed to the Grand Hotel, at which hostelry luncheon will be provided by the members of the North of England branch.

The huge pavilion to be erected for the Diamond Jubilee Celebration by Mr. J. N. Maskelyne in St. Paul's Churchyard, on the site now occupied by Messrs. James Spence and Co.'s premises, has been designed by Mr. J. G. Buckle, A.R.I.B.A. The pavilion will consist of four tiers, and will seat about 2,000 persons. A distinguishing feature will be the substitution of inclined approaches to the tiers in lieu of the usual steps. The pavilion has also been designed so as to permit of the several parts being prepared away, and brought upon the site ready for fixing. There will be ladies' retiring-rooms at each tier-level, and refreshment saloon, lounge, smoking-room, and lavatories in the basement. The cost, including decorations, will be about £4,000.

The Anaglypta Company, Ltd., of Darwen and London, have designed and are making a simple but remarkably effective commemorative shield in honour of the Queen's record-reign celebration. The shield is 42 in. square, and forms an admirable centre for wreaths, foliage, flags, &c. In the centre is a bust of the Queen surrounded by the garter, and flanked by the



royal supporters; below are the national emblems, the rose, shamrock, and thistle.

The new "Aquarius" wash-down closet, introduced by Messrs. John Knowles and Co., of Burton-on-Trent, and 38, King's-road, St. Pancras, London, N.W., has four distinct advantages. The outlet is adjustable to any position; the joint is submerged, and must be perfectly sound, or the water will at once reveal the defect; the joint is so simple that an unskilled workman can make it, and when made it is actually the strongest part of the closet; and it affords the easiest possible inspection. The outlet is surrounded with an annular groove or recess, into which the spigot of bend or junction is inserted. The joint is made by simply pouring in liquid cement till the groove is full. The cement surrounds the spigot, and, when set, forms an absolutely tight joint—well below the trap level, so that it is sure to be left sound. The idea is a distinct advance in closet-work.

### CHIPS.

The new dormitories, Rainhill Asylum, near Liverpool, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A fire, involving damage estimated at over £50,000, occurred on Monday morning at Kinning Park Saw Mills, Glasgow, the property of Messrs. Anderson and Henderson. The premises covered nearly four acres, and contained an immense quantity of timber, besides valuable machinery. The fire broke out in the resin department, and quickly extended to the joiner's shop and machine department. Within three hours about two acres of ground had been swept clear of their heavy stock of timber, all the buildings being reduced to ruins. One shed, the log saw-mill, and a number of stacks of wood are all that remain of the extensive works. Messrs. Anderson and Henderson, who employed about 180 hands, will immediately begin rebuilding.

The future of the Botanical Gardens at Sheffield has now been placed beyond doubt. A meeting was held on Monday to consider a proposal by the town trustees to buy the gardens for £5,000 and devote them to public purposes as a park or recreation ground. The meeting, by an almost unanimous vote, accepted the offer, and decided to dissolve the company.

A portion of the library of books and manuscripts of the late Professor J. Henry Middleton, formerly Slade Professor at Cambridge University and director of the Fitzwilliam Museum, came under the hammer on Monday and Tuesday at Messrs. Sotheby, Wilkinson, and Hodge's, the two days' sales realising a total of £848.

On Sunday afternoon, a memorial window to members of the Short family was dedicated at the parish church of Kirkstall, near Leeds. The idea of the window was taken from the celebrated Peel monument by the late T. Woolner, R.A., in Wrexham Parish Church, and has been carried out by Mr. Powell, of Leeds.

Lord Jersey, Colonel Boughy, and Mr. Gerald FitzGerald, the three commissioners appointed under the Light Railways Act, with Mr. Bret Ince, the secretary to the commission, have recently returned to London after holding a series of inquiries in Scotland. The commissioners in the course of a fortnight dealt with nine applications for orders to authorise light railways. At Aberdeen, two competing schemes were before them—one promoted by the Great North of Scotland Railway Company and the other by private promoters. In this case the commissioners, when their inquiry had lasted a day, conferred with the counsel for the respective promoters, and succeeded in arranging terms, under which the private promoters withdrew their application, and allowed the Great North of Scotland Railway Company's scheme to proceed practically unopposed.

At the Bridge Hall, Bideford, on Wednesday week, Mr. W. A. Ducat, Local Government Board Inspector, held an inquiry relative to an application of the Bideford Town Council to borrow £2,000 for the purpose of providing a suitable cattle market for the borough. Mr. Chowin, borough surveyor, gave evidence in support of the application.

The death took place on Friday at his residence, Wolverhampton-road, Stafford, of Mr. Wm. Pemberton, builder and contractor, in his 70th year. He was a member of the firm of Adams and Pemberton, and took much interest in the Young Men's Christian Association, of the branch of which he was vice-president. He also took a great interest in temperance work. Mr. Pemberton leaves two sons, the elder of whom is a partner in the business. His wife died several years ago.

### MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (To-morrow).**—St. Paul's Ecclesiastical Society. Visit to St. Saviour's, Southwark, under the superintendence of G. H. Birch, F.S.A. 3 p.m.

**MONDAY.**—Royal Institute of British Architects. Annual Meeting. 8 p.m.  
Society of Engineers. 7.30 p.m.  
Society of Arts. "Design in Lettering," Cantor Lecture No. 1, by Lewis F. Day. 8 p.m.  
Liverpool Architectural Society. Annual Meeting. 8 p.m.

**TUESDAY.**—Society of Arts. "The Arctic and Antarctic," by Aubyn Trevor-Battye. 4.30 p.m.  
Auctioneers' Institute. "The Rating of Special Properties," by W. G. Cooke, A.R.I.B.A. 8 p.m.  
Slater's Association. Half-yearly Conference at Newcastle-on-Tyne. Presidential Address, by A. B. Partridge. 11.30 a.m.

**WEDNESDAY.**—Architectural Association. Jubilee Banquet (Annual Dinner), Trocadero Restaurant, Piccadilly-circus. 7 p.m.  
Carpenters' Hall Free Lectures. "Timber and Composite Roofs," by Professor Banister Fletcher, F.R.I.B.A. 8 p.m.  
Society of Arts. "The Railway to India," by C. E. D. Black. 8 p.m.

Edinburgh Architectural Society. "Notes on Concrete and Cement," by J. J. Henderson, Dundee. 8 p.m.  
Slater's Association. Half-yearly Conference at Newcastle-on-Tyne. 9.30 a.m.

**THURSDAY.**—Architectural Association. Conference at the Royal Institute of British Architects, 9, Conduit-street, W., on the Policy of the Association, and the means of providing suitable accommodation. 3 p.m.

Architectural Association. Members' Soiree, St. George's Hall, Langham-place, W. 3 p.m.  
The Musical Play written by Mr. E. Howley Sim, with music written by Mr. Leonard Butler, will be presented under the management of Mr. G. B. Carvill.  
Society of Arts. "Kafiristan: its Manners and Customs," by Sir G. Scott Robertson, K.C.S.I. 4.30 p.m.

**SATURDAY.**—Edinburgh Architectural Association. Visit to Hopetoun House Policies.

A new drill-hall for the K Company of the 2nd V.B. Lancashire Fusiliers was opened at Ramsbottom on Saturday by Captain G. Kemp, M.P. The hall has been erected at a cost of over £2,000.

An anonymous donor has given £12,000 to the Royal Caledonian Asylum, London, towards the purchase of a site and building a new asylum in a northern suburb, in commemoration of the Queen's Jubilee. The offer came before the Royal Scottish Corporation on Monday, and it was unanimously agreed to accept it, and the managing directors were given authority to take steps to carry the proposal into effect.

The death was announced on Friday of Mr. Cuthbert Potts, consulting engineer, of Argyle-square, Sunderland. The deceased, who was widely known throughout the North of England as an authority on all engineering matters, was at one time in partnership with the late Mr. Colling, subsequently starting business on his own account. Mr. Potts was in his 55th year, and leaves a family of two sons and two daughters, his wife having pre-deceased him.

The fixing of tackle on the crown of Townsend's stalk at Glasgow for the purpose of ascending the chimney for repair work was successfully accomplished on Friday. Three weeks were spent by William Hall, the steeplejack, in placing the ropes in position with the aid of a huge kite. The repair work is in connection with the lightning rod conductor. Townsend's stalk is the highest chimney in the world. Its construction was begun in May, 1857, and it was not till October, two years later, that the work was completed. From the surface of the ground to the copestone the height is 455ft., and the iron crown at the top stands 21ft. high. The foundation is 14ft. below the level of the ground. At the foundation the diameter of the chimney is 50ft., at the surface of the ground 32ft., and at the top 12ft. 8in.

The Streets and Sewerage Committee of the Leeds City Council heard on Friday a deputation from the Leeds Trades and Labour Council, consisting of Mr. J. Judge (Builders' Labourers) and Mr. Newlove (Bricklayers), with reference to the contract for sewerage. They complained that the contractor had men working for him at rates which were under the recognised wages for labourers in the city, and called attention to the "fair contracts" clause which was adopted by the Corporation. The deputation urged that, instead of one contract for three years, the work should be let in four contracts, so that one man might not have a monopoly, and that the contracts should be for twelve months only, instead of three years. The matter was referred to a sub-committee, with instructions to draw up a report upon it.

### LATEST PRICES.

#### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 15 0 to	£6 0 0
Rolled-Steel Joists, English.....	6 0 0 "	6 10 0
Wrought-Iron Girder Plates.....	5 15 0 "	7 10 0
Bar Iron, good Staffs.....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 10 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	7 17 6 "	8 5 0
Best Snedshill.....	10 0 0 "	10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive gauge.....	£10 15 0 to	£11 0 0
Best ditto.....	11 5 0 "	11 10 0
Cast-Iron Columns.....	£6 0 0 to	£8 10 0
Cast-Iron Stanchions.....	6 0 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0 "	5 15 0
4in. to 6in.....	5 5 0 "	5 10 0
7in. to 24in. (all sizes).....	4 15 0 "	5 0 0
[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]		

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to	110s.
Hot Blast, ditto.....	57s. 6d. to	62s. 6d.
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes.....	75p.c. Fittings 77p.c.	
Water-Tubes.....	70 "	72 "
Steam-Tubes.....	62 "	65 "
Galvanised Gas-Tubes.....	60 "	62 "
Galvanised Water-Tubes.....	55 "	57 "
Galvanised Steam-Tubes.....	45 "	47 "

	Per ton.	Per ton.
Sheet Zinc, for roofing and working up.....	£23 0 0 to	£24 0 0
Sheet Lead, 3lb. per sq. ft. super.....	14 0 0 "	15 0 0
Pig Lead, in 1cwt. pigs.....	13 10 0 "	15 0 0
Lead Shot, in 28lb. bags.....	16 10 0 "	17 10 0
Copper Sheets, sheathing and rods.....	63 0 0 "	63 10 0
Copper, British Cake and Ingots.....	53 0 0 "	53 10 0
Tin, Straits.....	60 17 6 "	61 10 0
Do., English Ingots.....	64 15 0 "	65 5 0
Spelter, Silesian.....	17 10 0 "	18 5 0
Cut Clasp Nails, 3in. to 6in.....	£8 15 0 "	£9 15 0
Cut Floor Brads.....	8 10 0 "	9 10 0

	Per ton.	Per ton.
Wire Nails (Points de Paris)—		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9		per cwt.

#### TIMBER.

	per load	£13 15 0 to	£16 15 0
Teak, Burmah.....	11 10 0 "	15 5 0	
" Bangkok.....	—	—	—
Quebec pine, pitch.....	1 15 0 "	3 15 0	
" Oak.....	5 5 0 "	6 5 0	
" Birch.....	3 15 0 "	5 5 0	
" Elm.....	4 10 0 "	5 10 0	
" Ash.....	3 0 0 "	4 5 0	
Dantisc and Memel Oak.....	2 10 0 "	3 10 0	
Fir.....	2 15 0 "	4 15 0	
Wainscot, Riga p. log.....	2 0 0 "	4 5 0	
Lath, Dantisc, p.f.....	4 10 0 "	5 5 0	
St. Petersburg.....	5 0 0 "	6 10 0	
Greenheart.....	8 0 0 "	9 0 0	
Sequoia, U.S.A., per cube foot.....	0 1 9 "	0 2 0	
Mahogany, Cuba, per super foot.....	—	—	—
lin. thick.....	0 0 4 1/2 "	0 0 6 1/2	
" Honduras.....	0 0 5 "	0 0 6 1/2	
" Mexican.....	0 0 4 "	0 0 5	
Cedar, Cuba.....	0 0 4 1/2 "	0 0 5	
" Honduras.....	0 0 4 "	0 0 5	
Satinwood.....	0 0 7 "	0 1 0	
Walnut, Italian.....	0 0 3 1/2 "	0 0 7	

	£19 10 0 to	£22 10 0
Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2 in. by 1 1/2 in.—		
Quebec, Pine, 1st.....	14 0 0 "	16 0 0
" 2nd.....	6 10 0 "	10 0 0
" 3rd.....	10 10 0 "	12 0 0
Canada Spruce, 1st.....	7 15 0 "	9 0 0
" 2nd and 3rd.....	7 10 0 "	8 10 0
New Brunswick.....	7 10 0 "	8 10 0
Riga.....	9 0 0 "	13 10 0
St. Petersburg.....	9 0 0 "	16 10 0
Swedish.....	9 0 0 "	9 10 0
Finland.....	10 10 0 "	17 0 0
White Sea.....	5 0 0 "	20 0 0
Battens, all sorts.....	—	—
Flooring Boards, per square of lin.—		
1st prepared.....	0 8 6 "	0 15 6
2nd ditto.....	0 7 0 "	0 12 0
Other qualities.....	0 5 6 "	0 6 9

	per standard M:—	
Quebec pipe.....	—	—
U.S. ditto.....	35 0 0 "	42 10 0
Memel, cr. pipe.....	230 0 0 "	240 0 0
Memel, brack.....	200 0 0 "	210 0 0

#### OILS.

	per ton	£14 10 0 to	£15 15 0
Linseed.....	25 5 0 "	26 5 0	
Rapeseed, English pale.....	23 10 0 "	26 15 0	
Do., brown.....	14 17 6 "	15 7 6	
Cottonseed ref.....	29 10 0 "	30 0 0	
Olive, Spanish.....	23 0 0 "	24 0 0	
Seal, pale.....	27 0 0 "	27 10 0	
Cocoonut, Cochín.....	23 5 0 "	23 10 0	
Do., Ceylon.....	22 0 0 "	23 10 0	
Palm, Lagos.....	19 0 0 "	20 0 0	
Oleine.....	0 6 3 "	0 7 6	
Lubricating U.S..... per gal.	0 4 9 "	0 6 6	
Do., black.....	1 2 0 "	1 5 0	
Tar, Stockholm..... per barrel	0 12 6 "	0 15 0	
Archangel.....	21 0 0 "	21 10 0	
Turpentine, American..... per ton	—	—	—



## LIST OF COMPETITIONS OPEN.

Crompton—Public Baths (£4,000 limit)	£30, £20, £10	J. H. Mills, Clerk U.D.C., Town Hall, Shaw, near Oldham	May 1
Tonbridge—Technical Institute and Free Library (£4,000 limit)	30gs., 20gs., 10gs.	A. H. Neve, jun., Clerk U.D.C., 83, High-street, Tonbridge	15
Morecambe—Hotel Metropole	£100 (merged), £50, £25, and £15	Baxter and Abbott, Back-crescent, Morecambe	June 16
Eine, France—Water Supply Scheme (3,900 inhabitants)		La Marie, Eine, Pyrénées Orientales	July 1
Carlton, Victoria—Children's Hospital	£103, £50, £25	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	50gs. (merged in 5 p.c.), 20gs., 10gs.	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	—
Chesterfield—Brewery-street Board School (30 places)	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield	—
Bexhill-on-Sea—Drinking-fountain & Dog-trough (£200 limit)	No premium offered	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill	—
Burnley—Fountain, Queen's Park (£500 limit)	£10, £5.	G. H. Pickles, Borough Surveyor, Burnley	—
Bury, Lancs—Art Gallery and Free Library	£25, £10	The Town Clerk, Bury, Lancs	—
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit)		Borough Surveyor, Saiter Gate, Chesterfield	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Neepsend, Sheffield—Water Tower at Gasworks	United Gas Light Co.	Hanbury Thomas, Secretary, Commercial-street, Sheffield	May 1
Blackmore, Essex—Church Restoration		F. Chancellor, Architect, Chelmsford	1
Bradford—Reconstructing Midland Buildings		Milnes and France, Architects, Bradford	1
Morley—Eight Houses, Bridge-street		T. A. Battery, Architect, Queen-street, Morley	1
Bradford—Two Villas, Manningham Park		T. C. Hope, Architect, Old Bank Chambers, Bradford	1
Loftus—House and Shop	I. Rowland	A. F. Newsome, M.S.A., 11, Albert-road, Middlesbrough	1
Ballyclare—Three Houses and Store		Thos. Wilson, Stair Mill, Ballymore	1
Ballyclare—Seven Houses		W. P. Wilson, Knowhead, Ballymore	1
Leechpool, Mon.—Farmhouse, St. Pierre Estate		John Williams, St. Pierre Farm, Chepstow	1
Dalwhinnie, Kingussie—Church		Alex. Mackenzie, Architect, Kingussie, N.B.	1
Great Yarmouth—Warehouses, South Denes	Salmon and Eastick	C. G. Baker, Architect, Town Hall Chambers, Yarmouth	1
Ebchester—Sixteen Houses	Hamsterley Colliery Co.	The Colliery Offices, Ebchester, co. Durham	1
Derby—Mission Hall, Wallbrook-road	Wesleyan Trustees	Rev. C. E. Griffin, 60, Wilson-street, Derby	1
Aberdeen—Parish Council Offices		A. M. Mackenzie, Architect, 1, Bon Accord-street, Aberdeen	1
Bangor, Co. Down—Completion of St. Comgeall's Church Tower and Spire		J. Stephens, Surveyor, Donegall-square-buildings, Belfast	1
Grangemouth—Houses in New-street	Co-operative Building Society	G. D. Page, Architect, Falkirk	1
Whitworth—Lloyd-street School		The Vicar, Whitworth, Lancs	1
New Hirst, Morpeth—Wesleyan School Chapel		J. W. Taylor, A.R.I.B.A., Newcastle-on-Tyne	1
Marlock—Repairs to Church		Rev. A. P. Wickham, the Vicarage, Marlock	1
Runcorn—Victoria-road Schools Extension	School Board	F. and G. Holmes, Architects, Crosshall-street, Liverpool	2
Cairo—Native Tribunal Buildings	Egyptian Government	Offices, Service Administratif, Public Works Ministry, Cairo	3
Cardiff—Extension, Albany-road Board School	School Board	S. Rooney, Architect, Quay-street, Cardiff	3
Sleaford—Minister's House, North-gate	Trustees, Wesleyan Chapel	W. H. Manley, Market Place, Sleaford	3
Helley, Sheffield—St. Peter's Church and Schools		E. Fitt, 138, Alexandra-road, Helley	3
Craghead—Six Cottages	Co-operative Society	R. G. Cowe, Architect, Chester-le-Street	3
Newcastle-under-Lyme—St. George's Institute		R. Scrivener and Sons, Architects, Howard-place, Hamley	3
Alloa—Sixteen Houses at Sunnyside	Co-operative Society	G. A. Kerr, M.S.A., 37, Mill-street, Alloa	3
Market Weighton—Public Hall, Northgate	Parish Council	Gelder and Kitchen, Architects, 76, Lowgate-street, Hull	4
Skewer—Calvanistic Methodist Chapel		Rees Llewellyn, Architect, Birch-grove, Llanamlet	4
Charlton—Shelter, Maryon Park	London County Council	C. J. Stewart, Clerk, Spring-gardens, S.W.	4
New Swindon—Additions House and Shop, Fleet-street	F. Budgett	Drew and Sons, Architects, 22, Victoria-street, Swindon	4
Wylve, Wilts—Five Cottages	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	4
Tilhurst Station—Cottage	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	4
Barber's Bridge Station—Cottage	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	4
Ilkington—House in Raw-lane	Corporation	Medley Hall, Architect, 29, Northgate, Halifax	4
Great Yarmouth—Alterations to Free Library		J. W. Cockrill, Borough Surveyor, Yarmouth	4
Felixstowe—Four Houses, Eastward Ho	S. Firth	Eade and Johns, Architects, Ipswich	4
Stanningley, Leeds—Nine Houses	School Board	C. F. Williamson, Architect, 35, Park-square, Leeds	4
Sutton St. Edmund's—South Eau Bank School	Corporation	E. R. Mossop, Clerk, Holbeck	5
Lancaster—Additions, Slaughter Houses	H.M. Office of Works	T. C. Hughes, Town Clerk, Lancaster	5
Scarborough—Post Office Enlargement	Vestry	Hon. R. B. Brett, Secretary, 12, Whitehall-place, S.W.	5
St. Pancras—Redecoration, Vestry Hall		C. H. F. Barrett, Vestry Clerk, Pancras-road, N.W.	5
Lochmaben—Additions to Free Church	Jas. Rothwell	T. E. Watson, Bank House, Lochmaben	5
Abercynon—Wesleyan Chapel	Durham Co. Agricultural Society	Rev. J. Rowlands, 103, Clifnydd-road, Pontypridd	5
Tunstead—Alterations, Rookhill House	West Stanley Colliery Co.	S. T. Williams, Architect, Waterfoot	5
Stockton-on-Tees—Show-yard Erections		E. H. Cleasby, Secretary, Brookside House, Durham	6
Stanley, Co. Durham—Two Blocks of Houses		T. E. Crossling, Architect, Stanley	6
Clayton West—Surgery and Villa	Pontefract Industrial Society	John Kirk and Son, Architects, Huddersfield	6
Featherstone—Business Premises	Kensington & Chelsea Schl. Managrs.	Wm. Hurst, Architect, Pontefract	7
Banstead—School Enlargement	East Ashford Board of Guardians	J. H. Rutherglen, Clerk, Marloes-road, W.	7
Ashford, Kent—Workhouse Additions	Board of Guardians	Horace Hamilton, Clerk, 11, Bank-street, Ashford	7
Mallow—Piers, Gates and Walls, &c., to Nine Cottages	Mrs. Thomas	M. Regan, Clerk, Mallow, Ireland	7
New Tredegar—Alterations, 105-6, Commercial-street	S. Sharp	H. Sketch, Architect, New Tredegar	7
Morley—House	Midland Railway Co.	G. B. Clegg, Architect, 2, Peel-street, Morley	7
Brightside, Sheffield—Station	School Board	Jas. Williams, Secretary, Derby	7
Lancaster—School, Bowerham-lane	Jas. Scott	H. D. Wilson, Clerk, 85, Church-street, Lancaster	8
Elgin—Houses and Shops, High-street	School Board	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	8
Lancaster—School, Bowerham-lane		H. D. Wilson, Clerk, 85, Church-street, Lancaster	8
Keld—Schools	School Board	Rev. W. Crombie, Keld	8
Edinburgh—Additions, South Morningside School	Jas. Scott	J. Arnot, Clerk, Castle-terrace, Edinburgh	8
Elgin—Shops and Houses, High-street	Presbyterian Church Committee	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	8
Drumquin—Platform-Pulpit	Board of Guardians	Rev. D. Marshall, Drumquin, Ireland	8
Dolphinholme—Rebuilding St. Mark's Church	London County Council	Austin and Paley, Architects, Lancaster	8
Tenlypatrick—Manse	Central London Sick Asylum Board	S. P. Close, Architect, 63, Waring-street, Belfast	8
Blackhorn—Workhouse Laundry		R. C. Radcliffe, Clerk, Cardwell-place, Blackburn	8
Hanwell Asylum—Temporary Iron Buildings		R. W. Partridge, Clerk to Asylums Comtee., 21, Whitehall-pl., S.W.	10
Hendon—Sick Asylum	J. J. Wagstaff	F. W. Bailey, Clerk, Cleveland-street, W.	10
Halifax—House and Shop, Clog-yard	Polkinghorne and Co.	R. and R. E. Horsfall, Architects, 15, George-street, Halifax	10
Westcliff-on-Sea—Superstructure, Queen's Hotel	Corporation	Thompson & Greenhalgh, Archts., Bank Chambers, Southend-on-Sea	10
Plymouth—Brewery	Ashman and Co.	G. Adlam and Son, Engineers, Bristol	10
Plymouth—Covered Market		J. H. Ellis, Town Clerk, Plymouth	10
Bristol—Enlargement Premises, Broadmead	Board of Guardians	Jas. Hart, Architect, Corn-street, Bristol	10
Barry Dock—English Baptist Chapel, Holton-road	Trevethin School Board	Rev. T. P. John, 25, Regent-street, Barry Dock	10
Baldon—House and Stabling, Langley-lane	Admiralty Department	Fairbank and Wall, Architects, Craven Bank Chambers, Bridgend	11
Billericay—Alterations, Workhouse Floors	Building Club	The Master, Billericay Workhouse, Essex	11
Pontypool—New Schools, Park-terrace	St. Pancras Board of Guardians	H. Bythway, Clerk, Pontypool	11
Hartlepool—Conversion of Barracks into Coastguard Station	Corporation	Director of Works, Admiralty Office, Whitehall	11
Penywyn, Dowlais—Thirty-five Cottages	Co-operative Society	R. Harpur, High-street, Dowlais	11
Halifax—Stables, Washer-lane Dyeworks	Town Hall Trustees	Horsfall and Son, Architects, Lord-street, Halifax	12
Dartmouth Park Hill—Infirmary, Alterations	Corporation	Alfred A. Millward, Clerk, Vestry Hall, Pancras-road, N.W.	13
Rotherham—Swimming Bath, Market-street	Roumanian Government	H. H. Hickmott, Town Clerk, Rotherham	14
Harting—School Enlargement	St. Olave's Union	R. C. Blackwell, Down-place, South Harting, Petersfield	15
Clayton-le-Moors—Thirteen Houses		The Directors of Society, Clayton-le-Moors	15
Bridgend—Town Hall Alterations		Lambert and Rees, Architects, Bridgend, Glam.	15
Cardiff—Docks Branch Free Library		W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff	17
Jassy—Industrial School		Ministry of Agriculture, Bucharest	18
Horselydown—Laundry at Workhouse, Parish-street		E. Pitts Fenton, Clerk, Union Offices, Tanner-street, S.E.	20
Rochdale—Ten Houses in Howarth Cross-street	Industrial Society	J. Whitworth, 21, Millgate, Rochdale	—
Southampton—Avenue Congregational Church	Co-operative Society	E. T. Sims, Hon. Sec., Portwood Lawn, Southampton	—
Shipley—Twelve Houses, Windhill Crag	Walt and Saville	J. Crawshaw, Architect, 54, Otley-road, Shipley	—
Shiremoor—Five Houses		Davidson and Beadle, Architects, 33, Grange-street, Newcastle	—
Otley—Shed, Barras-lane		Fairbank and Wall, Architects, 3, Manor-square, Otley	—
Penshaw—Twenty Houses	School Board	Owner, Rose and Crown, New Herrington Barn	—
Tiverton-on-Avon—Schools	Co-operative Dairy Society	Silcock and Reay, Architects, Octagon Chambers, Bath	—
Audenshaw—Alterations, St. Stephen's Schools		J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	—
Ballinlirick, Co. Sligo—Creamery		M. Jennings, Secretary, Ballinlirick	—
Buckhurst Hill—Two Pairs Semi-detached Villas		— Batting, 7, John-street, Adelphi, W.C.	—



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### SECOND-HAND QUALIFICATIONS.

THERE are some things which the professional practitioner has to accept second-hand. All that concerns the history and traditions of his own art, the arts allied to, or subsidiary to it, like sculpture, painting, decoration, fictile-ware, and various processes he is called upon to understand thoroughly. There are other industries and trades, like some branches of engineering, heating and ventilating arrangements, electric lighting, &c., which he is required to master only so far as they are immediately connected with building, and as to be able to protect the interests of his client, as to which subjects he is obliged to accept to a large extent the experience and special knowledge of others. To some extent, therefore, he is compelled to take the opinions of men in these trades, if he would consult the interests of his employer and do justice to himself. In fact, he would be obliged to be a specialist in every branch if he presumed to dictate in everything that concerns a modern building. No half-knowledge would do in order, for example, to lay down definite rules about heating a public building, or specifying exactly how a perfect sanitary system was to be carried out in its many details. Take, for an instance, the sanitary and plumbing fixtures and details required in fitting up a large hotel or restaurant where an elaborate cuisine is required, or even a complex hot-water apparatus. It would be simply impossible for an architect, unless a specialist in this branch, to specify clearly and fully all the sinks and wastes from the several receptacles in the kitchen, scullery, pantries, and larders; the separate waste-pipes and their junctions and cleansing caps required to cut off any particular portion without disturbing others; how disconnected, how jointed, how branches are to be made, and the various other fittings for supplying water, taps, &c. In such a matter he can only specify in a general, often vague manner, which may be of little use to anyone, or leave the specification and details in the hands of the plumbing firm who contract to do the work. Probably, after all, the latter course is the wisest, as the contracting firm takes all the responsibility, and, for their own reputation, will do their best to carry out the work in a sound and workmanlike manner. At the same time, the architect would like to have some control, to select his own tradesman; but this he cannot always do if the work is under one contractor, and no provision is made for the architect's control.

On the selection of stone or any particular marble, it is questionable whether one architect in ten knows much about the subject beyond what he has learned from textbooks and reports, where he may find descriptions and notes of qualities, weight, crushing strength, absorption, chemical composition, and geological data—information which more often than not is unreliable, simply because these data have been derived from a limited experience, or are the results of tests upon certain beds of exceptional quality. Only the quarryman and practical lithologist can say whether any particular stone or variety of marble will be suitable for a given purpose. In such an instance as this, second-hand knowledge is often dangerous, and it would be safer if the architect visited the quarries personally or obtained an expert opinion on every occasion when it was contemplated to use a certain

sandstone or limestone. A museum of practical or economic geology is invaluable in supplementing the knowledge derived from books; but it is seldom resorted to by the student or young practitioner as it ought to be. What is true with regard to stone is equally true as to timber and special ornamental woods, which are known only by name to many. The architect's experience can only give him a direct knowledge of a few of the main timbers used in building, though of these he is often obliged to confess his ignorance, especially in specifying the particular brand he ought to have. An expert acquaintance with marks and brands and of shipments is not to be expected; it is the work of a lifetime, and to imagine that an architect ought to be familiar with the exact meaning of any number of letters and crowns, stars, or other devices, or what is meant even by such terms as "best middling," "good middling," and "common middling," as applied to Dantzig, Memel, or Stettin goods, is about as absurd as to expect him to be familiar with the marks on old china.

No doubt it would be considered now a serious defect in an architect's qualifications if he had to consult an engineer or ironfounder about the details of an iron girder or roof of any great span, especially as iron construction has now become recognised as a branch of building science as necessary for an architect to understand as carpentry itself; but we should like to know how many in the profession, who are in active practice, would feel any confidence in specifying the sizes and details of any work of this description without assistance? We suspect, very few. The fact is, iron construction has become a highly-developed branch of building. In theory, in experimental investigation, and in practical manufacture the most accomplished mathematicians, experimentalists, and engineers have been engaged on it for many years, and the science of iron construction is passing from an empirical to a more exact stage; and it is, therefore, beyond the accomplishment of any architect to become a complete master of the subject, or to feel confidence in specifying any iron or steel or any construction based on certain limits of elasticity or breaking strength per square inch. Even now our engineers have not arrived at any reliable results as to the rate of flow of a given metal, and specifications for iron and steel vary considerably in different countries as to details, and this will continue to be so until we have arrived at some unification of methods of testing. How can it be expected in these circumstances that the ordinary practitioner can feel that he is anything more than a learner, and that his knowledge of iron construction must be to a large extent second hand. Few things have told more unfavourably against architecture than having to consult engineers and manufacturers in the design of ironwork, where building contracts are in force. Then there are several special industries that have developed from iron construction with which the modern practitioner must be familiar. A very important development is that concerned in the manufacture of expanded metal or iron casing for fire-proof purposes. The production and uses of this form of construction have established many firms. The architect ought to be in touch with these industries and to a large extent must rely on those who supply.

Taking another new and highly important industry, that of electric lighting, although it is not closely allied with the architect's function, it is still one with which he has to reckon, both in the arrangement of an installation, as well as in the fittings and decoration of our domestic and public buildings. We cannot expect an architect to be an electrician; if he knows anything of "wiring" buildings he would feel it incumbent upon him to call in an electrician

before writing his specification—at any rate, if he wished to avoid defects and disappointments. Electrical installation is one of those branches which lie outside the architect's own work; but, at the same time, he is required to know a good deal about the subject as a mode of lighting.

We have taken only a few of the subsidiary branches of modern construction; others—like water-supply (hot and cold), ventilation, passenger lifts, laboratory apparatus, &c.—call for the attention of the architect who wishes to keep himself up-to-date, that would fairly surprise the practitioner of 60 years ago. Let the lesson be considered in this Victorian record reign. Even the list which Vitruvius gave of the qualifications of the architect in his day is a comparatively modest one compared with the requirements which the nineteenth century professor of architecture is supposed to be master of. We do not go so far as the opinion of Pythias, who expected every architect to be skilled in the practice of all these arts; but we imagine that even if he confined his attention to the theory of these many sciences or arts—the undertaking would be beyond his powers. The duty of the professional architect in these days is necessarily taken up with general directions and the control of others who are experts. That he has lost much by this arrangement no one can deny. The indirect or second-hand qualification induces to timidity in dealing with materials and matters of design; the textbook or the manufacturer's catalogue takes the place of independent thought, and any authoritative treatment is out of the question. The chief object of the architect is to find out how he can best utilise the knowledge he possesses of these special branches. The contract and the bill of quantities hinder rather than help him in these respects, for they often tend to restrict the control he would otherwise possess by placing the special tradesman under the contractor, whose chief aim is to reduce the labour. One way the architect has within his power, and that is to provide certain sums for certain special trades, by which he is enabled to keep them in his own hands. These provisional sums enable him to select firms who have an acknowledged reputation. There are many men who can make a design, but who are unable to say precisely how it is to be executed. They know what they want, but their defective practical knowledge stands in the way of a successful realisation of their ideas, and no doubt many a building has been spoilt in some detail by the inability of the architect to describe it with clearness, or show how it can be handled in the actual material.

### PICTURES AT THE ROYAL ACADEMY.

#### II.

ONE of the pictures we passed over in our first notice is George Wetherbee's large sea-piece, "Aphrodite's Realm" (19)—a sea of intense blue. Upon the white foam of the wave-crest, cupids are frolicking. It is cleverly treated, and the colour good. "The Golden Shore," by Julius Olsson, is another seascape, or bay of sapphire-blue waters, in which the painter introduces also nymphs disporting themselves; these and the cliffs are bathed in the red light of a golden sunset. Lillian Edmonds, a rising lady artist, sends a study of herself, palette in hand, painted in sombre grey, touched up by the bright notes of colour on her palette. Grey in tone and painted in a sympathetic vein is F. Stuart Richardson's "North Sea Crofters" (48)—a work in which his powers as a delineator of this class of subject is seen at their best; and in the same vein of realism is George Clausen's picture, "The Old Barn" (52); and H. H. La Thangue's "A Summer Morning" (56), a boy and girl in a boat in a stream amidst trees, water



plants, and sedges. The effect of sunlight is charmingly natural. John MacWhirter's "Affric Water" (76), a swelling torrent of water through a rocky defile clothed with rich foliage, and his other view, looking down, are worth notice. "Daffodils," by Sophia Pemberton (59), is graceful; and we cannot overlook a very beautiful study of "Ruth," by Philip H. Calderon, a charming face with dark expressive eyes, her head draped in white, worthy of the character of the damsel recorded in the Biblical idyll.

In addition to the pictures we have already noticed in Gallery II., we must notice Fred. A. Bridgman's blithesome picture of "Bacchanti," dancing and merry-making, crowned with vine leaves and coming through a grove through which the sunlight flickers. There is much sprightliness and movement in the dancing damsels. The somewhat peculiar subject, "Fantaisie en Folie" (138), a lady seated back on a chair leisurely, her eyes closed, and before her a Japanese doll, from which she seems to be unwinding a skein of silk, is a decidedly clever study of colour, and its title expresses the fantastic and whimsical amusement or occupation of the lady. A large sombre and dark picture, too much "skied" to enable one to examine it, is Marguerite E. Batley's "Daybreak." It represents a dark cottage bedroom, through the window of which the early morning light is struggling, and reveals a bedstead, on which lies an invalid his arm extended as if in suffering. A little girl at a small table is preparing the early meal. The painter has tried to realise the anguish and toil of humble life in this touching scene. Another subject of the same kind meets us in J. Henry Henshall's "Alone" (193), an old woman outside her cottage looking through a packet of letters, some of which are on her lap. One of them has awakened sad memories, for her eyes look into space, and she seems to have realised all at once her loneliness in the world. The painter has handled the subject with much ability and reserve.

C. Napier Hemy's fine picture of "Pilchards" (204) in Gallery III. is one of the few great works in sea-painting. We just noticed the subject last week—the haul of the glistening fish between the trawlers, and the labour of the men in securing the catch. All these details are shown with the skill of a painter who has spent a lifetime among the toilers of the sea, fishermen, and boats. But the qualities of movement, life, and colour are unsurpassed; the depth of blue, the sparkle and freshness of the early morning light, the silvery sky—all make it a masterpiece of sea-painting, fully entitling its painter to the recognition of the President and Council, who have secured it as one of their Chantrey pictures. Henceforth, Mr. Napier Hemy's work will rank with that of Colin Hunter. The qualities of his work have been apparent to all who have observed the development of the painter's skill from his earlier pictures of the Cornish Coast.

In its grand ruggedness and power, Peter Graham has seldom painted anything more impressive than his large canvas, "Where nought is heard but lashing wave and seabird's cry" (210). Here we see a wild, rocky inlet of the sea surrounded by precipitous and rugged rocks, partially obscured by the mist and spray of the lashing waves. Few painters of the sea can more awaken to the mind the grandeur of coast scenery, or realise on canvas the power of sea-wave, its motion and surf. "Meditation" is a sympathetic face, full of tranquil thought that seems to irradiate the lineaments of the maiden. It is by Frank Dicksee, whose graceful, allegorical "Dawn" we noticed last week. Robert Fowler (288) has cleverly embodied the spirit-world in his undraped maiden in a forest, who has projected her imagination in the form of a phantom.

"Come, enchantment old, whose spells have broken my spirit" explains, as far as words can, the painter's thought.

The principal example of portraiture in this gallery is certainly "Mrs. Carl Meyer" (291), by John S. Sargent. It is a portrait-group of this lady and her children, surrounded by all that costly art, French furniture, and brocades can give it, and Mr. Sargent has in this group applied the resources of his talent and art to the life of the period. The lady sits on a sofa or settee of the Louis XV. period, upholstered with tapestry; she is attired in a low bodice and skirt of pale salmon-coloured satin, and holds a fan in her left hand, while her right is extended over the settee to her little boy in velvet, who leans on the back of the couch, his sister behind him. The harmony of the whole is delightful; the colour in delicate tones of pale pink and grey. We might object to the somewhat artificial treatment, and the uncomfortable attitude of the lady, who sits rather sideways on the sofa, but the first objection is necessarily that of the period chosen. On the whole, Mr. Sargent's group is distinctly a bold departure from modern portrait methods, and is a decided success, even for him. It will be one of the very few pictures that will be talked about in fashionable London.

J. W. Waterhouse's "Hylas and the Nymphs" we had just space to notice last week, and will doubtless evoke some criticism. Mr. Waterhouse's nymphs are of one type of beauty, a face he generally introduces, and one unquestionably pretty; but some will say they are too much alike in feature. The figure of Hylas is graceful; he is kneeling on the bank of the pool surrounded by a number of winsome nymphs, whose white arms and bodies to their waists are above the water. Very beautiful is the colour of the pool and the surrounding banks and water-lilies.

Those who admire decorative subjects will naturally turn to Thomas C. Gotch's picture, "The Heir to all the Ages," in Gallery IV., a graceful young maiden daintily attired in a short dress of rich brocade of orange hue, and carrying a jewelled reliquary with both hands. The background is of rich grey drapery, and the colour a pleasing harmony. Mr. Gotch, in his design, "The Heir to All the Ages" (315), has challenged inquiries as to his motive in painting these symbolic designs. Are they idealised portraits, or are they graceful inventions representing virtues or verities—the incarnation of an abstract idea? Whichever they may be, they are pleasing and symbolic ideals, and have a certain decorative value. His last year's work, "Alleluia!" has been acquired by the Chantrey Fund. The technique and beauty of that work as a decorative treatment is repeated in this work in the embroidered, rose-coloured frock, the brown hose, and dainty shoes. The girl which is here depicted symbolises the childhood of the future; she carries a reliquary or monstrelance, as representing all the treasures of the past. Her face is of a pure and exalted type, her golden hair falls loosely over her shoulders, and her brown silk stockings and bronzed shoes, typical of all that is modern in dress, seem to carry out the idea of the title, "The Heir to All the Ages"—the present handing on the treasure of the past to the future. Such is this work of Mr. Gotch, which in its exquisite finish and technique, and distinctly noble and devout sentiment, cannot fail to be remembered.

One picture of the year which must attract attention is Miss Lucy E. Kemp-Welch's "Colt Hunting in the New Forest" (346), an imposing canvas on which this rival of Rosa Bonheur depicts a flight of galloping colts madly careering towards the spectator, marvellous alike in drawing and in movement. On each side are the colt-hunters. Wildness is depicted in the animals' eyes as

they gallop along in the midst of a beautiful forest, itself painted with consummate skill. Miss Kemp-Welch has certainly succeeded in mastering a subject of acknowledged difficulty—the representation of a galloping herd of ponies towards the spectator, in which not only the effect of perspective foreshortening, but a sense of motion and life under open-air conditions have to be studied. No one but a close and observant student of nature and forest life, and especially of the habits of ponies and their movements, could accomplish a feat of this kind, which recalls naturally to our mind the "Horse Fair" of many years ago. This lady-painter's "Foam Horses" and "Summer Drought" of last year attracted much notice; but this is even a greater achievement than her friends could have expected.

In the principal position of Gallery IV. is Edward J. Gregory's large picture, conceived some years ago, entitled "Boulter's Lock: Sunday Afternoon" (328). Mr. Gregory, we believe, has been working on this canvas many years. It is a brilliant, garish scene, full of well-dressed ladies and pleasure-seekers, of life and movement—qualities the artist has always enjoyed. A fine Sunday afternoon in summer, the lock is full. Here we have crowded together steam-launches and punts, and the gate is being opened, and the mixed crews are making their way through. The main fault we find with this canvas is a lack of shadow: all is bright and garish, as if the sun was directly overhead. This want of relief, or oneness of tone, distracts and spoils an otherwise clever and animated picture of life on the river. Albert Goodwin's large picture, illustrative of "The King's Garden," from the "Arabian Nights" (326), fails also from want of relief, though its composition is good in some respects. His "Florence," a companion picture (332), is much better. The "Garden by the River," by Yeend King (321), shows an old stone bridge crossing a river. The foreground of the picture is a private garden, which runs parallel to the river, and it is here that the painter has expended his labour. An invalid lady sits in an easy-chair, with her friend, enjoying the air and scene. The hollyhocks and other wild garden flowers give animation to the scene. C. Napier Hemy has here another of his grand sea-pieces, full of movement and freshness. "Lost" is without doubt, after his "Pilchards," one of the finest seascapes in the Academy, and shows a crewless boat half-submerged in a surging sea on a rocky coast. The movement of the waves, dashing against the rocks, and the awful beauty of the reflected light on the water, are painted with remarkable power. Next to this, J. J. Shannon's portrait of "Clare Sewell Read, M.P." (333), must be noticed, as one of Mr. Shannon's last works, full of character and tone. The large decorative-looking canvas by Arthur P. Burton, "Night Fleeing from Dawn," is boldly conceived but more suitable for a ceiling allegory. The nude life-size female figure flying away from the approaching dawn with inverted torch and the habiliments of night, is well-conceived, and its foreshortening is clever.

The works of J. C. Hook are not equal to former exhibits. The best of these, "Low Water at the Tidal Crossing" (340), shows a river reflecting the sky in those charming hues and gradations of colour which Mr. Hook delights to paint. Summer sunlight prevails; the stepping-stones or rocks with the pools of water between and the foreground are especially soft and subdued in colour. The other picture is less noteworthy, and is called "From the Shore to the Field" (287), a boy with a load of seaweed ascending a path cut through the shore. It is a Cornish coast scene, the distant sea in gradations of blue and grey and turquoise is a fine study of colour and reflection. John Brett has one of his brilliant coast scenes, in



which his earlier pre-Raphaelite manner is observed, "The South Stack Lighthouse" (384). A line of cliffs reflecting iridescent hues skirt the sea, which is one of those sapphire-coloured seas with crested curling waves so dear to the painter. The sunlit rocks and lighthouse are the conspicuous objects, and these are set off by the dark clouds behind. A vessel scudding before the wind explains the particular effect Mr. Brett has chosen to depict. Altogether, the scene has mystical charm and brilliance about it that will attract the visitor. Stanhope A. Forbes' "Across the Stream" is a picturesque piece of woodland, with a horse watering in the distance, and a tumbling rivulet making its way over rocks. The portraits by Solomon J. Solomon (363 and 383), are clever examples of strong light.

Edgar Bundy's "Puritans" (391) in the Fifth Gallery, a party of Cromwellians seated round a table in a room lighted by a large mullioned window, is replete with character. Demure faces mingle with those who look eager for spoil, and the painter has here given us an historical incident of much power and scholarly detail. We have already spoken of one of H. H. La Thangue's works in the first gallery. His principal picture is "Travelling Harvesters" (439), in Gallery V., one of the most conspicuous works of stern realism. Mr. La Thangue's work has successfully shown how hard peasant-life can be made attractive, and he can infuse into his subjects a kind of poetry of their own. As Mr. Clausen has shown us peasant-life in meadows and ploughed fields under sombre grey skies, this painter shows how warm sunlight through leaves, or from glowing sunsets, can be made to irradiate and brighten the toils of the labourer. Here we have, as in last year's picture, a "man with a scythe"—an elderly man with his wife and daughters, trudging along a path from the banks of a river he has just crossed. We see the ferry-boat returning. Simple in its story, the painter has invested it with a poetic charm; the drawing and grouping of the peasant and his family are excellent, and the last rays of a strong sunset brighten the faces and figures of the toilers, who have the sunlight full on their eyes. This work will certainly strengthen Mr. La Thangue's claim to the rank of Associateship.

Stanhope A. Forbes, who last year gave us his picture "The New Calf," and before that his more famous "Forging the Anchor," is less ambitious in his picture "Christmas Eve" (405), a group of strolling waits in a steep street in Penzance, the end of which is closed by a church, whose illumined painted window tells of a Christmas vigil. The dark gloom of a winter night in this Cornish town has settled over the street. On the left is a house with the sign of the "Dock Inn," before which the musicians are playing as waits; a lighted lamp sheds its rays over the passers, players, and sellers of vegetables. There is a certain pathos about the picture which places it above a commonplace street scene; yet few, we think, will fully appreciate the work. The same painter's work in the third room, already noticed, will find probably more admirers.

The greatest subject-picture of the year is Mr. E. A. Abbey's play-scene in "Hamlet" (477). Last year this talented American artist achieved much success by his scene from another Shakespearean play in "Gloucester," which, for its boldness and scheme of colour, Mediaeval quaintness, and decorative detail, attracted considerable attention. "Hamlet" is not equal to that work, but is probably his second great picture. In the background of a dark state chamber we see, sitting apart, the King and Queen—the former, with a look of cowardice and cruelty, beginning to understand the play that is being acted; the latter, terror-stricken, much troubled, and half-

hiding her face, is clad in crimson. Here, too, are grouped the courtiers, Polonius, and others, while on the floor is Hamlet reclining on Ophelia—the latter pale, timid, and apprehensive; Hamlet fixes his eyes on his uncle, and watches the impression the play makes upon him, but Ophelia is vacant and unobservant; Horatio looks keenly at the monarch. Mr. Abbey's picture is thoroughly original in motive; it does not suggest the stage. In the composition and accessories the Mediaeval sentiment is strong, and the tapestries and other details have a decorative value of their own. There is an harmonious contrast of colour; the red gives richness to the sombre background, the light being concentrated on the figure of Ophelia, who is clothed in white, her fair hair falling by the side of her face over her shoulders. Her eyes are wide, and have an expression of bewilderment and agony in them. Criticism will doubtless be expended on this picture as to points of composition—the position of the Prince, his dress, and Ophelia's attitude; but as an unconventional treatment of the play scene few will hesitate to give a favourable opinion. Mr. Abbey has placed the spectators of the play opposite the observer; we do not see the players, but a full view is thus obtained of the King and Queen, Prince of Denmark, and Ophelia, whose countenances and expressions are so well painted. It is an ideal presentment of Hamlet. The scheme of colour, too, in which black and red and gold predominate, gives a solid, impressive, and almost solemn, effect to the scene.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—II.

LAST week our remarks on the uncommonly numerous series of ecclesiastical designs shown at the Academy this year were left uncompleted, and so to-day, following the same mode of reference afforded by the catalogue, we will endeavour to briefly indicate some of the more interesting examples of church work chosen by the hanging committee as representative of contemporary undertakings of this class. In not a few of these exhibits the internal fittings of churches furnish the chief items in which the display of novelty, not to say originality, has been exercised. Thus the proposed screen and decoration, shown by Mr. G. J. J. Lacy (1774), for All Saints', Cambridge-circus, W.C., attracts attention. The wooden wickets in the chancel screen would seem better suited for garden gates, while, for joiners' work, in any case they are certainly not well contrived; neither do the graceful and delicate green foliations on the white woodwork of the screen itself appear particularly adapted to the dirty purlies of Soho, where even the harsh primaries of a Butterfield's Mediaevalism, soon begrimed by fog, have lost all self-assertion, if not the last traces of recognition. But, for all this, Mr. Lacy's drawing arrests our notice, for we see in his work some pleasant suggestions, while his water-colour does not necessarily appear to have been made ostensibly as an exhibition picture, and, in parenthesis, we may here remark how very few of those who now have found an honoured place on the walls of the Royal Academy would have secured admittance at all had autograph drawings been obligatory, and had the "ghost" been relegated to limbo. The Flamboyant gallery-fronted rood-screen for Blisland Church, Cornwall (1808), by Mr. F. C. Eden, affords too low an entrance to the choir of an Anglican church wherein the iconostastis, or anything approaching it, is out of place entirely. The open parclose here drawn would be in keeping towards the west end of a nave dividing off a baptistery, for instance, or by the side of a choir separating a chapel. The chief feature in

Mr. Eden's work is comprised in the painted and flatly-treated figures on the gallery face with their upper parts breaking its top line, and showing, as it were, in silhouette. There is, of course, an unmistakable degree of cleverness about all this detail, and we are aware of an endeavour which it evinces after something fresh and up to date. Anything, perhaps, is better than the mediocrity of the mildly orthodox. Mr. Henry Rose exhibits a pretty water-colour by another hand of a new altar to St. Mary's, Chad-desden, Derby (1819), in which there is a befitting sense of design, particularly in the organ front above the aisle-screen beyond. The kneeling woman in the picture, facing east, betokens a chapel to which this inclosure is but the entrance, suggesting the question as to whether it is, in any case, a proper contrivance, to locate the sanctuary of even a subsidiary altar under the windbox of an organ. The clever pastel study of Douglas Castle Chapel, displayed by Mr. C. W. Whall, on the left of Mr. Norman Shaw's Liverpool warehouse, as a foil, and to balance Mr. H. Wilson's dramatic study in colour of Welbeck Abbey Staircase, is distinctly bold and attractively artistic, though we consider it much too big in scale of drawing, thereby giving an undue importance to so small a subject. Full of ability as these two mellifluous studies in colour may be, and we heartily applaud them as chromatic essays, neither one nor the other ought to obtain so manifest a prominence while so little space in such a small room is devoted to modern architecture, and from the walls of which several suitable drawings of exceedingly capable buildings of far greater importance than either of these have been this year excluded—works, be it said, of consequence in their way, and of public interest too, as well as of distinct architectural merit. Mr. Whall's drawing does, however, condescend to intelligent detail. We can see, at any rate, what he means in the lace-like elaboration of the triptych and barrel vault of the roof above. But it is impossible for anyone to make out Mr. Wilson's phantasm of iridescent harmonies wherein archaic forms in newel, balustrade, and walls are dramatically vague and intentionally obscure, definition being lost with unquestioned cleverness by the author, who appears to be dominated by a desire at all hazards to obtain recognition. The sculpture suggested might be interesting, but it is too obscurely delineated. Mr. Chas. A. Nicholson's water-colour of the font and its surroundings in Cockington Church, Devon, is also none too well defined 'midst the glaucous glamour in which so much is left to the imagination. The well-hoist kind of structure, consisting of two massive uprights and a cross-beam from whence to suspend the font-cover is relieved by an emblazoned shield supported vertically above, merlon-like, betwixt some scrolls. Right and left of the font are wall benches, possibly in stone, so massive is the treatment, while under the west window a dossal is introduced, breaking the line of the sill. St. Mary's, Kettering, by Mr. Gotch (1918), leaves no room for doubt that its designer, best known for his book on the English Renaissance, is more at home in secular work than in ecclesiastical. The sprawling segmental arches of the nave arcade of this church are very ungainly and lacking in good proportion, and the same may be said of the windows over them, while the details, so carefully shown, display a want of sympathy with that spirit of worship which ought to pervade in the same degree the design of every church. The round-arched basilican church, proposed by Mr. William A. Pite, in Lancaster-road (1890), has an apsidal end and a barrel-vaulted roof. The building is planned rather as a base for a scheme of colour decoration, without which St. Columb's, if built after this design, would look very bald. What



detail there is we cannot admire—it is too composite, and seems associated with secular ideas and buildings. Messrs. Austin and Paley's Church at St. Anne's-on-Sea, we illustrated last summer from this drawing (1885), here exhibited, a characteristic work, and we also illustrated Mr. Mountford's new east end of St. Anne's Church, Wandsworth (1819). Hawksyard Priory, by Mr. Goldie, near Rugeley, Staffordshire, shown by a bird's-eye view (842) is designed in a Late style of Gothic, making a suitable group, at once as orthodox as it is picturesque. Mr. A. H. Skipworth displays a knowledge of church requirements with which he works in sympathy, showing no little taste and power of reserve. He sends this year two competition designs, one for St. Aidan's Church, Walton-le-Dale, and another for Cockington Church, Devonshire. Mr. Nicholson, whose font we have above described as designed for the same church, possibly may have won the competition; but, if so, his design of the building itself is not exhibited, though the same hand shows an unsuccessful design (1787) for the church at Exeter. That competition of all others is most largely represented in the present exhibition. One of the designs for it is by Messrs. Demaine and Brierley, which has a peculiar Spanish-like capped tower (1928). The altar-tomb to the late Bishop Durnford (1882), with its elaborated canopy in masonry, for Chichester Cathedral, is a handsome composition, richly detailed in strict accord with the best type of our national Mediæval work, the spirit of which is thoroughly realised—a fitting memorial of one of the most saintly bishops of the modern Church. Mr. J. Belcher is proposing to carry out new stalls and an organ-case, with screen, at Kington Church, Warwickshire, and he has with some skill chosen a rococo type of Late Jacobean with which to furnish a 15th-century church. How much is old and how much hypothetical in this drawing (1800) the visitor to the exhibition is probably not expected to say. The new church at Bentley, near Doncaster, by Mr. John Codd, is shown by two different views. It is plain and comely, and has a simple tower and spire, which looks more massive in the S.W. view than in the other, where the effect is decidedly thin. We must conclude these church references by an approving note of Mr. J. Oldrid Scott's south transept and tower to Selby Abbey, with which the new work is made to harmonise in an orthodox way. The newer school of architects would probably have done something more startling and more out of character. Turning now in conclusion to the domestic and civil buildings illustrated in the exhibition not previously mentioned, one of the first which may be noted is a pencil sketch of a House at Hampstead, by Mr. T. Garner, marked by a central porch of home-like proportions; and, as might be expected from such an architect, it is pleasing and a capable design. The perspective is too high up on the walls to be properly examined. Mr. A. S. Jones's design for a school at Scarborough, here drawn in elevation, is well balanced and picturesque. Her Majesty's Theatre, Haymarket, by Mr. C. J. Phipps, is a large addition to the architecture of the West End, cleverly planned and popular in style (1760). We have already illustrated its elevation, and next week we shall give the view. Mr. Ernest Runtz is imparting, we are glad to see, much more character into music-hall architecture, and his "Royal" in Holborn (1761) and the Empire Palace of Varieties, Middlesbrough (1847), are advances upon his previous work, the later showing breadth and a study of the Spanish Renaissance. The last named is an improvement upon the ordinary theatre façade so common in this country. The Panmure Arms Hotel, Edzell, by Mr. T. M. Cappon, and the

Hedgehog Inn, Nottingham, by Messrs. Brewill and Baily, are both good instances of small hostleries suitably huddled. Messrs. Silcock and Reay show a Jacobean house at Bath, picturesquely contrived with balustraded terraces and well-studied detail. The wrought-iron gates for Dacre Court, Buckingham Gate, by Mr. C. J. C. Pawley, are rather fresh, with a broad frieze and bold, wide, pilaster-like panels, concentrating the enriched parts cleverly, and giving value to the grill-like interspacings. Mr. Chas. F. A. Voysey sends one of his white-plastered houses, so much in favour with advanced artistic people. It is for a site near Guildford, a charming part of the country, and the building will nestle into its place with the air of an old farmhouse, quiet and simple, innocent of any display of detail, with an acquired air of Quaker-like complacency. The remodelling of Lacock Chancel, Wilts, shown as proposed, by a good drawing from the brush of Mr. Harold Brakspear, is a work which ought to be tenderly and lovingly done in respect to the old fabric, an exceedingly interesting building (1804) which we know well. Mr. Pinhorn Wood's Nursery Frieze (1806) is a curious piece of ornamentation ill-adapted to be placed so far from the eye, and ill-considered as a decorative scheme, so small and finikin, and yet so lumpy, with carrots and other vegetables kicking about, festooned by their roots from a tendril-like foliation, quite Persian in the delicacy of its scale. Mr. William Ravenscourt shows a large water-colour bird's-eye of a good, commodious house with stabling at Maidenhatch, Pangbourne, and Mr. J. J. Stevenson exhibits a degree of change in his work by the French feeling which he has imported into the high mansard-roofed houses shown by him in South-street, Mayfair (1825). Mr. Beresford Pite has a frame of three details from street houses at the West End, in which sculpture forms the most interesting feature, recalling Alfred Stevens's famous chimney-pieces in their general idea. The Public Baths, Kennington-road, are shown by Mr. A. H. Tiltman by the drawing which we quite recently illustrated. Another group of well-designed Bath buildings is Mr. L. Murray Robertson's Lochee "Free Library and Baths" (1854), broadly managed in terracotta. Messrs. Wimperis and Arber show some bungalows crisply drawn at Herne Bay, and their Restaurant at Prince's Hall, Piccadilly. Mr. Alex. Koch is represented by the Vlierboom House, Zurich, which we illustrated last year, and Mr. C. H. Heathcote's house at Buxton (1894) has also appeared in our pages. Messrs. Hall, Cooper, and Davis exhibit a competition design for Knaresborough Grammar School, showing originality and "go." Messrs. Bateman and Bateman do nice domestic work, and so do Messrs. Niven and Wigglesworth.

#### LATER RENAISSANCE ARCHITECTURE IN ENGLAND: HAM HOUSE, PETERS- HAM.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

THE unqualified success of "The Architecture of the Renaissance," published by Mr. Batsford, under the editorship of Messrs. J. A. Gotch and Talbot Brown, has fortunately inspired the same enterprising publisher to supplement that classic work by another\* of like character, in continuation, as it were, of the history of our national Renaissance Domestic architecture erected subsequent to the Elizabethan period. The congenial task of editing this undertaking has been committed to Messrs. John Belcher and Mervyn E. Macartney, and we have the first part of the series

of six now before us. Among our illustrations will be found a reduced reproduction of one of the photographic plates, which we have chosen to graphically indicate the type of buildings illustrated among the Later examples of architecture not comprised in the previous volumes to which a fitting reference has been made. The chronological sequence of the buildings depicted in the plates has not been aimed at in allocating the subjects to the Parts of the book, because the authors appear to have thought it desirable to insure as great a variety of subjects as possible in each issue, leaving for final arrangement the order of the pages before binding, and as the sheets are all properly numbered, there will be no difficulty in managing this. Some plans are, we understand, being made to accompany the descriptive text, and we venture to impress upon the editors the lasting value and enhanced interest always secured by plans whenever they can be obtained. The dates of the buildings, too, in an archaeological volume of this kind materially add to the plates as ready records, particularly in a bulky book not primarily intended or otherwise adapted for hasty reference. In the Part before us we notice that the dates have been omitted from the illustrations, and as the descriptive letterpress is standing over for the present, the reader has to exercise his own judgment or seek references elsewhere.

The scope of this book does not entrench upon the ecclesiastical designs of Sir Christopher Wren and his successors, seeing that these were ably dealt with by Mr. G. H. Birch, in the splendid folio of "London City Churches," likewise published by Mr. Batsford. This being so, the three works will together form a monumental series of the first consequence, and of lasting value to all who take an interest in the history of the "revival of letters" and the development of historic modern art.

The concise essay, furnishing an introduction to Messrs. Belcher and Macartney's volume, scarcely permits of an abridgment, dealing as it so tersely does with the movement which began in Italy in the 15th century, and soon pervaded the greater part of Europe under the title of *Renaissance* as given by the French. In France the national love of display and luxuriances was uncongenial to the severity of Classic forms, though parts of the Louvre are to be quoted as exceptions, and in Belgium the same elegance and refinement is to be noted, particularly in its woodwork of those days; while in Germany the Renaissance proved often coarse and inspired by a love of grotesqueness. In Spain the Moorish and Gothic influence lingered and imparted an individuality at once distinct and characteristic. In Holland, the home of brick architecture, stepped gables and band-work frequently alone furnished the modes of ornamentation. In England, our traditional methods, indigenous in their way, were very gradual in their development from the days of the Tudors, though they were more or less modified by external influences, such as Royal marriages, and later on by the accession of Dutch William. The Sunny South quickened more rapidly the period of transition, while here at home it was quite a century after the revival in Italy that the Renaissance produced any extended impression on our national buildings. The period embraced by the Later Renaissance in England, as thus denoted in the folios before us, extends from 1640 to 1800, comprising buildings known in a generic sense as "Queen Anne," though their style commenced in the reign of James I. and developed under the Georges. Here we must leave the preface, wherein the reader will find much useful information and suggestive learning, followed by biographical notes and references to the architects chiefly associated with, and generally known as, the authors of buildings erected in this country during the 150 years under review.

Of the 26 plates in the Part before us, 20 are occupied by large specially-taken photographs, the remainder are devoted to measured details, drawn by such accomplished draughtsmen as Messrs. W. A. Forsyth, A. Stratton, J. J. Joass, R. W. Schultz, and H. M. Fletcher. The subjects chosen in the present assemblage are thoroughly typical, and capably represented with the utmost delicacy and finish. The Ashmolean Museum, Oxford, furnishing some Italian-like detail, is too familiar to be described here; but the suggestive house at Eltham was previously quite unknown to us. Wilton House, near Salisbury, and its Palladian Bridge are, of course, more famous than most

\* *Later Renaissance Architecture in England. A Series of Examples of the Domestic Buildings erected subsequent to the Elizabethan Period.* Edited, with introductory and descriptive text, by JOHN BELCHER and MERVYN E. MACARTNEY. London: B. T. Batsford, 94, High Holborn. Issued to subscribers, six guineas.



examples, and fortunately are kept in excellent repair, even though they really possess less general interest to the architect than the smaller examples of building, such as Groombridge Place, Sussex, a delightfully plain old brick house with a bridge, and adjoining picturesque buildings. The old ashlar-fronted house in Salisbury Cathedral Close, or, again, the brick and stone house in West-street, Chichester, are likewise specimens of this domesticated and entirely English sort of work, so unassuming and yet often replete with comfort, at once dignified without ostentation. Kew Palace, a trifle more ambitious, is always interesting, though perhaps over-windowed, and wanting in wall-breadth consequently. Ham House, with its mullioned central part, stately doorway, and arched wings, recalls the Elizabethan type of plan, and obtains a picturesque effect by the range of lead busts located in oval niches above the stringcourse and representing Roman Emperors. The colour, too, of the bricks and grace of the gardens enhance the charm of the place. Ham House, the seat of the Earl of Dysart, overlooks the Thames opposite Twickenham, a mile's distance from Richmond. Mr. G. F. Bodley restored the mansion four or five years ago at a very considerable outlay. It was built originally in 1610, or, at any rate, that date with the words *Vivat Rex* occur over the principal entrance door. Macaulay tells us that John Maitland, Duke of Lauderdale, 1674, Baron of Petersham, one of the Cabal Ministry, greatly altered the house and refurbished it, "with more than Italian luxury." Ham House was the scene of the private councils of the Cabal intrigue. James II. was housed here prior to the entry into Westminster of William of Orange. Notwithstanding Lauderdale's alterations and the mutilations subsequently carried out, Ham House retains much of its Vavasor and Jacobean character, and remains the best house of its time in the vicinity of London. Its gardens, already named, are untouched examples of Charles II. epoch. The colossal statue on the lawn is emblematic of the Thames. The interior of the house is most interesting. Prior Park, Bath, furnishes a famous subject for Plate 90, and if as a mansion it is of but sparse interest in itself, the house obtains much grandeur by the clever and extensive arrangement of steps leading up to it, and which group so handsomely with the pedimented portico overlooking the valley below, where there is a Classic bridge spanning the lake, much admired by men of this school. "Widcombe," Bath, is another good house, in a similar ambitious phase of the same style, which, when thus handled, better befits an institution, to our thinking, than a private dwelling, though it is impossible not to admire so graceful a piece of detail. Greenwich Hospital, Ashburnham House, Somerset House, the Radcliffe Library, Oxford; Trinity College Chapel, Oxford; the Great Hall, Winchester College; Peterhouse College, Cambridge, and the Home Office, facing St. James's Park, are among the remaining subjects, and with this bare recital a sufficient indication is afforded of the wide and careful choice with which the opening part of this worthy undertaking is enriched. Mr. Batsford's venture cannot fail to meet with an appreciative reception from architects and the art-world generally, because it covers ground not adequately treated before, and if we may form a conclusive opinion from this instalment, it will be done thoroughly and well.

#### A GOLD CHALICE BY MESSRS. HARDMAN, POWELL, AND CO.

A GOLD chalice of 18-carat quality, and weighing, with its paten, 53oz., has just been made for presentation to a Roman Catholic bishop in the United States. The chalice is 8½ in. high, and follows in design the lines of the best period of Mediæval metal-work, while the detail is wholly original. The foot, which is hexagonal in form, is ornamented with six champlévé enamels, of quatrefoil form, set within rich repoussé foliage representing the vine, the symbol of the wine used in the sacrifice. The enamel on the front represents the Crucifixion, four others respectively Saints Peter and Paul, the patrons of the cathedral over which the bishop presides; Blessed Virgin Mary, the patron of the diocese; and St. Matthew, the name saint of the bishop himself, while the sixth contains the prelate's arms. The foot is further enriched with diamonds, set round the principal enamel, and

sapphires set at the intersections of the sexfoil curves that outline the base. On the knop are set clusters of aquamarines, typical of the water used in the Mass, while the leaf of the bowl is enriched with more sapphires. The leaf is further relieved with six champlévé enamels of seraphim set within repoussé work of wheat-ears, also emblematical. The upper part of the bowl is engraved with the words "Calicem salutaris accipiam et nomen Domini invocabo," and upon the paten is engraved a richly-floriated cross with the "Agnus Dei" in the centre. The gold plate is inclosed in an oak case lined with rich ruby velvet and bound with polished-brass corners, and upon the plate of the handle of the lid a dedicatory inscription is engraved. The work is the production of Hardman, Powell, and Co., of King Edward's Works, Birmingham, and is a



rich and beautiful example of the goldsmith's craft. It was despatched last month to Liverpool for shipment to America in charge of a special messenger.

#### PAPYROLITH: A NEW MATERIAL FOR FLOORING, ROOFING, &c.

A NEW material, suitable for flooring, roofing, lining of water-closets, bath-rooms, walls, &c., was invented by Otto Kraner, at Einsidel, near Chemnitz, Saxony, about two years ago. The article did not, however, prove to possess sufficient resistance and consistency. Subsequently it was taken up and improved by Messrs. Braendli and Co., at Mainaustrasse No. 24, Zurich, Switzerland, who, by the addition of some chemicals, have, as they claim, brought it to perfection and made it as durable as stone.

I called on the above firm to obtain what information I could, and from them learned the following:—Papyrolith is a new kind of material, the principal ingredients of which are waste-paper and sawdust. These two substances are mixed with certain chemicals, which, so far, are the exclusive secret of the manufacturers. The material is made into three separate bodies—viz., (1) a moist powder, (2) a dry powder, and (3) a liquid. These are then mixed in a proportion of four pounds of moist powder with six pounds of the dry one, and enough of the liquid substance is mixed therewith to bring the mass to the density of ordinary mortar. It is then spread over a foundation of wood or stone, as the case may be, in the same manner as asphaltum or cement, stamped down, levelled, left to dry, and then polished. It requires at least two days to dry and harden.

This papyrolith, it is claimed, becomes as hard as stone, but without losing its elasticity, is perfectly water-tight, fireproof, a non-conductor of heat, cold, or sound: being spread into one solid mass, it has no joints, is not porous, is non-adherent of dust or microbes, is noiseless, and, therefore, especially recommended for flooring schoolhouses, hospitals, houses and public halls, water-closets, and bath-rooms.

For roofing, it is spread over a grooved or kind of corrugated roofing pasteboard, especially manufactured for that purpose. It is lighter than other roofing material, weighing only fourteen kilogrammes per square metre (about 26lb. per square yard), and requires, therefore, but a light wooden construction to support it; it is water-tight, a non-conductor of heat or cold, and, what is more important, it is incombustible. It can be made in whatever colour desired.

As to its wear and durability, the article has not been in use long enough for experts to give an opinion; but contracting architects, with whom I have talked on the subject, believe that it possesses all the qualities the manufacturers claim for it.

The Zurich school authorities have had floors of this material laid in several of the city school-houses as a trial. In the Federal Museum an entire hallway is covered with it. Private individuals are contracting for it to line the walls of their bath-rooms, kitchens, &c., in place of tiling, formerly used for the same purpose, it being watertight and less cold, and not so apt to crack under the changes of temperature.

The prices of papyrolith, laid down and ready for use, are, for the present, quoted at the following figures by the manufacturers (Braendli and Co.):—Floors with a layer of 0.59 in. thickness, about 1d. per square yard; floors with a layer of 0.985 in., about 1.25d. per square yard; roofing, 1d. per square yard; walls, 1.25d. per square yard; special decorative work, as per agreement. Cost of manufacture is not obtainable.

No patent or application, therefore, has been obtained or applied for. The manufacturers state that none is obtainable on an article of this kind; but as the chemicals or mixtures used in the preparation of papyrolith are only known to themselves, they feel safe against competitors.—EUGENE GERMAIN, U.S. Consul, in the *American Architect*.

#### THE ARCHITECTURAL ASSOCIATION JUBILEE BANQUET.

THE completion of fifty years' increasingly useful and successful work by the Architectural Association has been celebrated this week with great enthusiasm. The proceedings commenced on Wednesday evening with the annual dinner, given in the large hall of the Trocadero, Shaftesbury-avenue, W.C., and which was attended by nearly all the surviving past-presidents, vice-presidents, secretaries, committee-men, and other members who have taken an active part in the work of the past five decades.

The chair was occupied by Mr. Beresford Pite, the president, who was supported by Viscount Halifax, the Bishop of London (Dr. Creighton), Mr. H. C. Richards, M.P., Professor George Aitchison, A.R.A., P.R.I.B.A., Messrs. W. Henman (Birmingham Architectural Association), E. M. Bruce-Vaughan (Cardiff Society of Architects), S. Perkins Pick (Leicester Society of Architects), J. Ely (Manchester Society of Architects), C. Hadfield (Sheffield Society of Architects), Ellis Marsland (hon. sec. Society of Architects), G. Donaldson Selby, Captain Lambton Young, A. S. Murray, LL.D., W. H. St. John Hope, F.S.A., Alex. Graham, F.S.A., W. M. Fawcett, F.S.A. (Cambridge), F. W. Pomeroy, H. Devey Browne, J. M. Brydon, E. Priolieu Warren, J. Jacob (Master of the Carpenters' Co.), W. J. Cloake (Master of the Painters' Co.), Col. Brabazon Urnston, A. W. Weedon, A. Wallace Rimington, H. Tanner, sen., H. Tanner, jun., C. Forster Hayward, W. A. Pite, R. H. Weymouth, F. J. O. Smith, O. Smith, A. S. Flower, J. E. Drower, W. Burrell, A. Hessel Tiltman, M. Garbutt, E. O. Sachs, R. Elsey Smith, L. J. Watts, J. Joass, sen., J. J. Joass, A. E. Northcote, A. W. Earle, E. A. Prynn, H. F. Prynn, A. F. Cutler, C. D. Imhof, J. H. Wilson, Bradley T. Batsford, H. Batsford, F. Inigo Thomas, W. Stonhold, J. W. Stonhold, G. B. Carvill, Owen Fleming, H. Huntly Gordon, A. J. Gale, J. Neale, R. S. Balfour, A. N. Prentice, H. A. Satchell, H. Phillips Fletcher, A. H. Hart, Philip L. Waterhouse, W. H. Purchase, F. G. W. Bass, F. J. Potter, S. E. Barrow, G. H. Jenkins, A. J. Dalton, G. S. Nichol, E. Greenop, T. W. Aldwinckle, jun., C. Brée, P. J. Groom, W. B. G. Lewis, E. Bates, W. E. Davis, M. F. W. Bunney, J. Ormrod, G. A. Cracklow, A. Smithers, N. C. Bathurst, J. G. N. Clift, S. B. Beale, R. Savage, H. C. Eyres, R. V. Hunt, J. Hunt, F. Sills, E. Castellan, W. K.



Appleton, C. E. Bateman, W. J. Prichard, H. N. Kerr, K. Kerr, A. Harrington, C. E. Varnell, F. Bond, A. W. Johnson, J. Murray, G. P. Pratt, A. G. Turner, P. Buchanan, C. H. Freeman, R. Freeman, C. Dunch, W. Stohold, H. I. Potter, G. H. Lovegrove, W. Heelis, F. E. Eden, H. Rose, A. F. Wrighton, H. Drury, A. J. Gale, S. C. Arding, E. Carless, D. G. Driver, W. Rushworth, R. E. Bartlett, A. J. B. Ward, J. T. Carew, E. R. Barrow, W. E. Hewitt, G. T. Forrest, H. L. Anderson, R. S. Balfour, H. A. Satchell, W. Stokes, H. E. Mathews, J. F. Bull, J. H. Gill, and F. W. Marks. Last, but by no means least notable, the following is the long list of ex-officers also present, arranged in order of date of service:—Past Presidents: Professor Robert Kerr (1847-8), Messrs. J. Edmeston (1853-4), T. Milner Rickman (1854-5), John Norton (1858-9), Professor T. Roger Smith (1860-1 and '63-4), Thomas Blashill (1861-2), J. H. Christian (1864-5), William White, F.S.A. (1868-9), Lacy W. Ridge (1869-70), T. H. Watson (1870-1), Rowland Plumbe (1871-2), J. Douglass Mathews (1872-3), J. Salmon Quilter (1875-6), H. Cowell Boyes (1876-77), H. L. Florence (1878-9), S. Flint Clarkson (1879-80), Aston Webb (1881-2), E. G. Hayes (1882-3), Cole A. Adams (1883-4 and 1884-5), J. Alfred Gotch, F.S.A. (1886-7), John Slater (1887-8), H. D. Searles-Wood (at the time of his presidency, 1888-9, and previously, known as H. D. Appleton), Leonard A. Stokes (1889-90 and 1890-1), Frank T. Baggallay (1891-2), H. O. Cresswell (1892-3), E. W. Mountford (1893-4 and 1894-5), and W. D. Caröe, F.S.A. (1895-6), Mr. Pite's immediate predecessor in the chair. Past Vice-Presidents: R. O. Harris (1865-6), John Sulman (1877-8, now of Sydney, N.S.W.), T. E. Collcutt (1880-1), F. E. Eales (1883-4), Hampden W. Pratt (1884-5, Treasurer and President-elect), Henry Lovegrove (1888-9), F. R. Farrow (1891-2), Paul Waterhouse (1892-3), E. Woodthorpe (1892-3), E. S. Gale (1893-4), Francis G. F. Hooper (1894-5), F. T. W. Goldsmith (1895-6), G. H. Fellowes-Pryne (1895-6 and 1896-7), and W. Howard Seth-Smith (1896-7). Past Hon. Secretaries: J. K. Colling (1850-1), J. Pollard Seddon (1850-1), T. W. Goodman (1854-5), Banister F. Fletcher (1895-7), and E. Howley Sim (1896-7). The after-dinner speeches were of a high order, and so many old and honoured workers were at the call of the chairman that the flow of oratory was almost unbroken, the two or three songs interpolated being reduced, to the obvious satisfaction of the assembly, to one or two verses. The enthusiasm, and even emotion, manifested was very marked, the culminating point, perhaps, being reached when the veteran Professor Kerr rose to reply for "Our First President," supported by his two early secretaries, Messrs. Colling and Seddon. The proceedings will indeed long be recollected by all present as one of the most interesting gatherings they have been privileged to participate in.

The PRESIDENT gave, in appropriate terms, "The Queen and Royal Family" and "The Church." In proposing the latter toast, he referred to the connection between architecture and the Church as one which was interesting and vital, but difficult to define. The enthusiasm which all students of architecture felt was due primarily, no doubt, to the magnificent edifices erected in the past for purposes of worship; but when they went a step further and asked what was the character of this art, they were brought face to face with the crux of the difficulty—its definition. He felt sure that, with the Lord Bishop of London as their guest—than whom no one possessed a more profound knowledge of ecclesiastical history—he need say very little of the motives which awakened our admiration alike in the stately cathedral and in the village church. There was no class of architecture in the land which evoked so much enthusiasm in the student as that of our churches—their sketch-books were full of it from the earliest days when they could draw Gothic arches in perspective. Further than that, professional men were conscious that where the Church was prosperous there architects also prospered. They could now appreciate alike the beauties of the architecture of the 13th century and of the centuries which immediately followed it; they passed on to the Elizabethan period—the days of Shakespeare and Bacon—and saw that there was then being fashioned the love for Classic art which led to the work of Inigo Jones and Wren.

In the recollection of the Association, and in that of its earliest past presidents, there had been conflicts, and even battles of the styles; but the very men who used to speak of the Debased architecture now admired it as the Renaissance, and people had come to look dispassionately on post-Reformation and even pre-Raffaellite art. He asked them to drink to the Prosperity of the Clergy, in all their good works, spiritual and temporal.

Dr. CREIGHTON, in responding, said they were all interested in architecture, and all felt a debt of exceeding gratitude to architects, for everybody needed to be housed in comfort; but whereas domestic architecture was adapted solely to convenience, the Church demanded architecture which was adapted to the expression of ideas. For this reason church architecture was inspired, and was calculated to work those mighty miracles of which the President had spoken with much enthusiasm. The church was the only building which directly challenged the architect to do his very best; a house, nay, even an immense block of municipal buildings, was subdivided, whereas a church presented a mighty unbroken span, which, both outside and within, afforded opportunities and facilities for broad treatment, and for ornament and decoration. A church not only furnished opportunities for the practice of high art, but in its very simple structural capabilities it presented large problems. Since he had been in London he had been struck with the exceeding resourcefulness of modern art, especially in the newer churches, particularly in an adaptation to the site unknown in ancient days, and in making the uttermost use of opportunities. In this utilisation of chances, architecture virtually consisted, and no higher praise could be given to any art. (Cheers.) He was afraid we were often tempted to cast a glamour of romance over the past which we denied to the present; but if we studied the history of old buildings we should alter our opinions. Of course, we had to bear in mind that the Mediæval builders were in no hurry to complete, but it was too much overlooked that the builders of the great Mediæval churches and cathedrals were competing for pilgrims, and that these glorious structures, of which we spoke with such enthusiasm, were designed purely as huge advertisements to draw customers from the establishments on the opposite side of the way. First a choir was built for ritual purposes, and then the nave and transepts were gradually thrown out and extended. Indeed, they would find that where these buildings were in progress near such others, if word came that the one church was being lengthened, the builders of the other church made a great effort and went one bay better. (Laughter.) This exceedingly prosaic and commonplace suggestion lay at the bottom of a great many buildings we now admired so much. He was not sure that the present-day architect looked upon the clergy as church-builders with unalloyed satisfaction. They were, at the best, employers of labour who bestowed on the work they ordered, as most employers were believed to do, a vast amount of unintelligent criticism. It was the ill-fortune of architects to be subjected to much of this unintelligent criticism—he sincerely condoled with them, for nowadays even bishops were not free from similar treatment, and which was offered with a freedom and volubility which excited his admiration. (Laughter.) No doubt it was highly beneficial to bishops and to architects alike; but the natural man did not like it;—but after a little reflection they would even welcome it. It was not always wise, however, for people to tell stories that told against themselves. It reminded him of the story of a bashful young clergyman, who, on being appointed to a village curacy, called on the great lady of the village to introduce to her his newly-married wife and himself. He was afraid that in doing so he was exceedingly indecent, for, presenting his wife, he quoted with ill-timed modesty the saying, "It's a poor thing, madam; but it's my own." With great severity the village lady looked from one to the other, and then observed to him: "Sir, your wife ought to have introduced you as 'A poorer thing, but my owner.'" (Great laughter.) He feared that very often when architects presented their designs to be criticised by the clergy, while they avowed the drawings to be poor things, but their own, they made the mental reservation concerning their employers openly expressed by the lady in the story. But they should bear in mind that the clergy in turn were

subject to those behind them, and that when they required of architects bricks to be made without straw, the demands on them were equally great, owing to the exigencies of a great and ever-increasing population. He cordially wished the Association all success and prosperity, for every clergyman must feel how largely dependent he was on the architectural surroundings by which he was envired.

Viscount HALIFAX said he entirely differed from the Bishop of London in one respect—he understood him to say that, while ideas were necessary in planning a church, they were by no means necessary in designing a house, whereas much of the comfort of life depended on the right disposition of doors, windows, and fireplaces. Among the many and great improvements which the Queen's long reign had witnessed, he believed there were few in which the advance was more marked than in the architecture and planning of the ordinary house. He thought the most trying and enraging position in which an architect could be placed was to have a Philistine for a client, who cut down his design and robbed it of all its charm and beauty. There was no profession he should like to exercise as that of an architect, were it not for fear of the criticism and over-ruling of the unintelligent employer. He proposed the toast of the evening, "Prosperity and Continued Success to the Architectural Association," referring to its system of self-education and to its annual excursion and other forms of social intercourse, and, in conclusion, expressed a hope that, after all present had passed away at the end of another fifty years, their successors would have to celebrate a still greater and more marked period of progress. With the toast he coupled the name of the President.

The toast was received with the greatest enthusiasm, the name of the President being received with renewed cheers and musical honours.

The PRESIDENT, in responding, remarked that their guests would understand something of the interest of the gathering, something of the memories which it awakened, and something of the hopes which filled their hearts, when they reflected that it was just fifty years since a little group of scarcely more than a dozen students banded themselves together to form the Association. They had as a body since suffered many vicissitudes: the members had even at times lapsed into apathy, but never into death. They had survived all those early troubles; had developed and increased into the present influential body. Their position was this: Instead of being a little band of architectural draughtsmen meeting in the offices of various architects, they now included the whole body of architectural students, and also a large number of those who, having passed through the classes, had by their works attained an influential position in the eyes of the public; indeed, many of their past officers were now recognised as honoured leaders of the profession. Their early hopes had, indeed, been more than realised. The assembly that evening of so many past-Presidents made the occasion unique. It seemed difficult to believe that they saw sitting with them at that table their first President in the person of their dear and honoured friend, Professor Robert Kerr, and as they well knew he was not a mere momentary visitor, but he had maintained his warm interest in the Association throughout all the intervening years, his presence might well awaken their sincere enthusiasm. The feeling of interest was deeper when they reflected that there were present that evening others who, even before Professor Kerr's acceptance of the President's chair, were his fellow-workers. They were also honoured with the presence of that wonderful artist, Mr. James K. Colling, who foretold the birth of the Association, and was one of its very earliest officers. They had also at that table their old friend, Mr. John Pollard Seddon, who worked side by side with Mr. Colling as honorary secretary so far back as 1850, and when they looked round and saw these and other early workers, they felt they were indeed in the presence of the Architectural Association as it was half a century ago. They looked up from their ranks to those of the Chartered Institute of Architects, somewhat hampered, he thought, with the dignity of its golden chain, and represented by its president, and their early member, Professor Aitchison, who had just been re-elected to his high office. Their old friend, Arthur Cates, who would have been present but for the state of his health, was the life and spirit of the Association in its early days, and had originated



the system of examinations. Without the examiners, and, still more, without the students supplied by the Association classes, the system would have had a very poor chance of success, and he was inclined to say that the Institute was the Association, with an important difference. Their present position was that, although all who joined the Association did not connect themselves with it for life—it was to be wished that they did continue their membership to a much larger extent—they now numbered 1,200 members, and they carried through their classes each year some 200 names. The Association had one burning need—some one building which they could call their own, and in which all their meetings and classes could be held, and which should be a worthy architectural embodiment of their history and aims. They appreciated the generosity of the Institute in granting them the use of the meeting-hall at Conduit-street, but were loath to encroach on that hospitality, while they wanted more room for the classes, and premises which were not leasehold. In the name of all the past-Presidents and officers he appealed to all the brethren to help to supply them with the means of providing suitable premises for carrying on their work, and for housing and extending their valuable library.

Professor KERR, who was received with enthusiastic and prolonged cheering, requested Messrs. Colling and Seddon, his hon. secretaries, to stand up with him in memory of old times. In proposing the toast of "Prosperity to the Royal Academy, the Institute, and Kindred Societies," he remarked that he could hardly believe that 50 years had elapsed since he became their President, and although not now a member, his interest in the Association was unabated. His views might be unexpected to many present; but he held that in its association with other societies their body took its highest ground. The Institute of Architects was the headquarters of organisation, and it had always felt very friendly to the Association; it had assisted them in many ways. The Royal Academy represented Art, as the Institute of Civil Engineers represented Science in *excellence*, while Literature was typified that evening by the Society of Antiquaries. It was very seldom that these scientific and artistic temperaments were combined in one man, Michael Angelo and Goethe being noteworthy exceptions to the rule. Addressing himself to the younger members, the veteran Professor reminded students that the public primarily required of architects plain, practical, commonsense, good workmanship, and hard-working men. During the whole of its fifty years of existence, the Association had been a self-educating body, and only by self-study and self-improvement would they as individuals succeed. With the toast he coupled the names of Professor Aitchison and Mr. Ely.

Professor AITCHISON, in acknowledging the toast, reminded the members that the Royal Academy was the first body in this country to provide opportunities for giving some instruction to architects. He added that he was a member of the Association when Professor Kerr occupied the presidential chair, and to come there that evening, and to see and hear so many of the early workers, had reclothed him with youth. He trusted members would recollect that architecture was a constructive art, and that no one could expect to make progress without an intimate knowledge of construction. He saw no reason why architecture should not again become a progressive art, and evolve a new style.

Mr. JOHN ELY responded for kindred architectural societies, remarking that in Manchester and other provincial centres the professional and educational aspects of usefulness—represented in London by the Institute and the Association—were combined in one body, and all were now in alliance with the R.I.B.A. There were sixteen provincial societies with a total membership of about a thousand, the highest individual total being 108 members. In conclusion, Mr. Ely heartily congratulated the Association on having attained its jubilee, and especially congratulated Professor Kerr, its first President, on being present on so interesting an occasion.

Dr. ALEXANDER S. MURRAY proposed the toast of "Literature," observing that there was probably no body of professional men for whom the charms of literature had so great a delight as architects. When reading the other day the delightful book by Palgrave on "Landscape in Poetry," he wondered whether a similar work could not be compiled on the claims of "Architectural Poetry."

With the toast he coupled the name of Mr. J. A. GORON, past-President, who responded in a graceful speech. Something had been said that evening, he said, of the insufficient knowledge of clients. Possibly that defect might in some measure be remedied in the future if his hope were fulfilled that some one might arise who (perhaps in that Association)—who would be able to descant on the fascination of architecture in such a way as to captivate even the ignorant employer, whom they all respected in their inmost hearts. As one who had practised all his days in the diocese of Peterborough, from whence Dr. Creighton had lately been translated, he was cut to the quick to hear the Bishop admit that until he came to London he had not realised the resourcefulness of the modern architect. [Laughter and cheers.] Architects no longer fought about styles: they had now come to bathe with delight in what not long since was regarded as "the foul torrent of the Renaissance," and he even looked forward to the time when enthusiastic books should be written on the beauties of Gower-street. He would suggest that architects should look forward, and not be bound too firmly to the past. It might be that the mission of the A.A. was to disseminate educated architects over the whole of the country, so that in all parts of the land they might see buildings springing up which had the stamp of excellence upon them. He should always treasure as a pleasant memory that he was present that evening at that golden wedding of youth and art.

Mr. JOHN SLATER, in proposing "Our Guests," said if they more frequently invited distinguished outsiders to their meetings, it would tend to dispel some misconceptions by the public as to the duties of an architect, his methods of practice, and his professional charges. He associated with the toast the names of Mr. H. C. Richards, M.P., the chairman of the Society for the Protection of City Churches.

Mr. RICHARDS, in the course of a humorous reply, said that he had frequently in his professional career heard distinguished architects give evidence as to professional charges, and he was bound to admit that the unanimity with which they supported one another convinced him that they were a class who had no professional rivalries, and that if one member suffered, all the body suffered with him.

Mr. ASTON WEBB, in proposing the toast of "The President-Elect," said Mr. Hampden W. Pratt had a formidable task before him in writing a further page of history on the fifty-first leaf, in following such a president as Mr. Pite. He did not know what would be the character of that writing; whether Mr. Pratt proposed to further the scheme for securing new premises, in which he would be warmly supported by the past-Presidents—whether he proposed to remodel the classes, or, as treasurer for many years past, he intended to formulate a scheme whereby the finances would be put on a firmer and more stable foundation;—but they all welcomed him as an able, honest, and straightforward worker, who had done good service in the past.

Mr. PRATT, in reply, who was also heartily cheered, said the kindly welcome he had just received must encourage him to undertake the arduous task of following Mr. Pite. The work of the Association in the past had always been a success, and he would do his best to continue in that good course. That work was very different now from what it was when the Association was formed, and had also progressed in many directions since he joined its ranks, now considerably more than a quarter of a century ago. They had, in fact, advanced and developed with the times, and it would be his earnest endeavour to help forward the movement and to keep unfurled the flag of progress. He was pleased to see that it was being carried forward with the old enthusiasm, for this enthusiasm had been the secret of past success, and it would be, he felt sure, from the augury afforded by the splendid gathering that night, maintained in the future. He would, in conclusion, remind them that everything depended on the vigour and persistency with which members, and especially the students, applied themselves to the work of the Association.

Yesterday (Thursday) afternoon a well-attended conference was held at 9, Conduit-street, W., under the chairmanship of Mr. Beresford Pite, President, when ten-minutes' papers on the policy of the Association, followed by conversa-

tional discussion, were given, the subjects taken up being: (1) The Work of the Technical Institute as related to the Architectural Association, (2) The Work of Provincial Architectural Societies in relation to the A.A., and (3) What Subjects should be Compulsory in an Architectural Examination, and What Studies should be regarded as Supplementary? There was an excellent loan display of architectural drawings and water colours by past students on view.

In the evening the members and their friends assembled in large numbers at the annual *soirée*, which was held at St. George's Hall, Langham-place. A musical play, written by Mr. E. Howley Sim, with music written by Mr. Leonard Butler, was presented, under the management of Mr. G. B. Carvill, the leading parts, as usual, being taken by members. We shall give a report next week.

#### EXPANDED METAL AND ITS USES.

THE Expanded Metal Company, Limited, of 39, Upper Thames-street, E.C., whose valuable method of fireproofing floors and ceilings and partitions we have before described, have published a new handbook on their productions, which explains the many and varied uses to which expanded metal can be applied. The idea of expanding sheets of metal into lattice by means of slits, so that the sheets can be opened out and stretched to produce lattice or trellis work, has been developed by this company to a very large extent, and many of our most important buildings of recent construction have been treated in this way, amongst them H.M. War Offices, Post-offices, L.C.C. works, many of the great banks and numerous mansions, including Lord Rothschild's mansion, Tring; several hotels and restaurants, as the "Trocadero," Piccadilly, and numerous theatres and public buildings, a long list of which is given at the end of this pamphlet. The illustrations and descriptions given enable anyone to see how the expanded metal can be employed in building. As a substitute for lathing, the expanded metal has many advantages; the plaster or cement is imbedded or "keyed" on the lattice work in a very secure manner, making it very difficult—sometimes impossible—to break the cement. The insertion of heavier expanded steel into slabs of concrete is a most important development, and the company show various types of fire-resisting, sound, and vermin-proof floors and partitions. The expanded metal can be introduced on the lower surface of the slab of concrete, so as to impart tensile strength, and has been used in this form for floors, walls, buildings, &c., and the strength of the concrete has been thereby increased tenfold. Reference is made to Sir John Fowler's and Sir Benjamin Baker's report on this question of strength, which every architect and engineer should read. The sections of floors illustrating the company's systems are useful, and show several methods. System 1 has intervening channel arches, and is called the channel arch system, and has been used in large buildings, with spans of 8ft. to 16ft., the arches 4ft. to 5ft. apart, formed of curved steel channels. Other systems are simple slabs with expanded metal which bear on I-beams, and are for floors of moderate strength for offices, schools, and houses. The most simple and economical floors can be constructed. Clear diagrams are given, showing the expanded metal, tension-bond, coring laid on centring, the mode of suspending ceilings of plaster on the metal lathing, with air-space. The methods of constructing partitions, covering beams and columns, casing girders with the expanded metal, and examples of metal lath-and-plaster ceilings are shown. In short, the method can be applied to every kind of structural or decorative purpose. We recommend to our readers an attentive perusal of this little book.

A meeting of parishioners was held last week in the old R.C. Church of St. Joseph, Terenure, to take steps to raise funds for the erection of a new church. The estimated cost of the building is £12,000, and nearly £3,000 was subscribed at the meeting. The new church is to be in the Romanesque style, and will consist of nave, sanctuary, aisles, transepts, side-chapels, and priests' and boys' sacristies. The entire length of nave and sanctuary is 119ft. 6in., and width between pillars 27ft. The aisles will be 12ft. wide. A baptistry will be at the west end of the south aisle, and a tower porch at the west end of the north aisle. The dimensions of each transept are 27ft. by 28ft., with recesses in the gable wall of each for two confessionals.



# STABLE CONSTRUCTION AND SANITATION.—XIII.\*

IN the ordinary type of door-roller, it is found that the axle wears very unevenly after continued use, causing increased friction and greater difficulty when opening and closing the door. Fig. 127 shows an improved form of roller, in



Fig. 127.

which the axle is allowed to roll freely in a slot, thus minimising the friction, and permitting the door to be opened and closed with ease.

Another method of fixing sliding-doors is to suspend them on rollers from an iron rail at the top of the door opening, as shown in Fig. 128. The doors are provided with a guide-rail and guides at the bottom.

A serviceable door for harness-rooms is shown in Figs. 129 and 130. It is 6ft. 6in. high, 3ft. wide, and 2½in. thick, wrought, framed, and

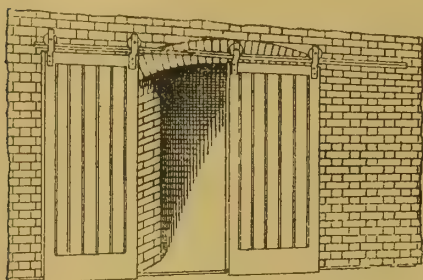


Fig. 128.

braced, filled in with 1in. grooved, tongued, and beaded battens, and hung to 5in. by 4in. fir proper door frame, with one and a half pairs of 4½in. butt hinges. The door is secured with a strong Norfolk latch and dead-shot lock, the frame being fixed to the walls with four wrought-iron holdfasts, and fitted with cast-iron shoes. A fanlight similar to that already described for stable doors is also provided.

The usual construction of doors for coach-houses and stores is shown in Figs. 131 and 132,

Fig. 130.

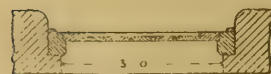
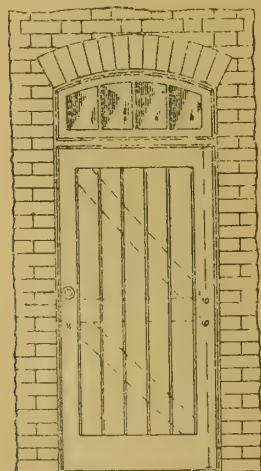


Fig. 129.

the size of the opening being 8ft. 6in. wide and 8ft. high. The doors are 2½in. thick, wrought, framed, and braced, filled in with 1½in. grooved, tongued, and beaded battens, and hung folding

\* All rights reserved.

Fig. 132.

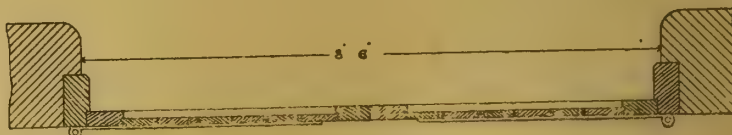
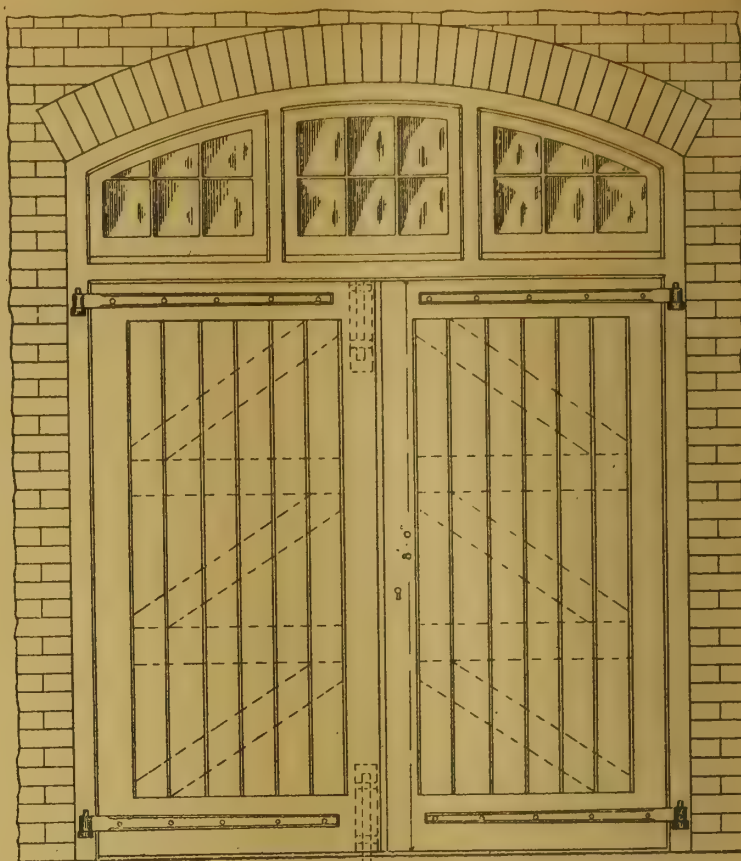


Fig. 131.

with wrought-iron strap hinges to a 9in. by 6in. fir proper door frame. Instead of being hung with hinges, the gates may be arranged to slide on top or bottom rollers.

Figs. 133, 134, and 135 are the plan, elevation, and section of a pair of gates suitable for stable yards, &c. The gates are 3in. thick, wrought, framed, ledged, and braced, filled in with 1½in. grooved, tongued, and beaded battens, hung folding, and provided with a small wicket gate. The upper hinges are strong wrought-iron hook-and-eye hinges, the hooks being securely leaded into a stone block. The lower hinges turn on stout gunmetal pivots leaded into a stone base. A 5in. by 3in. oak, wrought, sunk, and rounded capping with wrought iron spiked ridge is fixed on the top of the gates, whilst the bottom edge is provided with gunmetal friction rollers running on 2½in. by ½in. wrought-iron racers let into a stone curb and run with lead. The gates are secured with a strong barrel bolt and a wrought-iron swing-bar with hooks riveted on plates, and fitted at one end with hasp, staple, and padlock. The wicket gate is formed of 2½in. deal, wrought, framed, rebated, and beaded, filled in with 1in. deal battens, grooved, tongued, and beaded, hung with one pair of 4½in. butt hinges, and secured with a Norfolk thumb latch and dead-shot lock.

## INTERNAL WALL SURFACES.

The method of finishing the interiors of stables depends in a great measure on the class of building to which it is to be applied. For stables of a plain and inexpensive character, such as are required for farmsteads, tramway companies, general carriers, &c., the face of the brickwork is generally left exposed, the joints being flat-pointed and the surface lime-whited or colour-washed.

A good appearance is obtainable at a slightly-increased cost by rendering the walls with

Portland cement and sand to a height of 6ft. or 7ft., the remaining portion being left exposed or plastered in the ordinary manner. The upper part of the wall should then be colour-washed or distempered, the cement dado being painted a darker shade of the same colour. Quiet and subdued tones of colour should be selected, such as light blue, pale green, French grey, &c.

The walls of better-class stables are finished in a much more expensive manner, the general appearance being thereby greatly improved. The inner face of the walls may be built with glazed bricks of different colours, and jointed in cement. The result from a sanitary point of view is all that can be desired, as a thoroughly non-absorbent surface is obtained which is easily kept clean by simply washing with water. There are, however, some objections to this mode of treatment being carried out in its entirety, for the lower part of the glazed brickwork is liable to be damaged by the horses and attendants.

The materials usually employed for lining the walls of stables are wood, glazed tiles, slate, marble, enamelled iron, and cement. For general purposes a satisfactory finish will be obtained by lining the whole of the walls with wood, from the floor to a height corresponding with that of the manger level (about 3ft. 6in. high). By thus boarding the lower portions of the walls the risk of nervous or restive animals damaging themselves is minimised. The walls of the loose-boxes, and also that portion immediately over the manger in the stalls should be then lined with glazed tiles from the manger level as far as the top rail of the loose-box or stall division. Marble slabs, plain or enamelled slate slabs, or enamelled iron plates may be substituted for the glazed tiles if desired. The mouldings and cappings for the wall boarding and tiles should be of iron, so that they may not be disfigured by the biting and gnawing of the



FIG. 134.

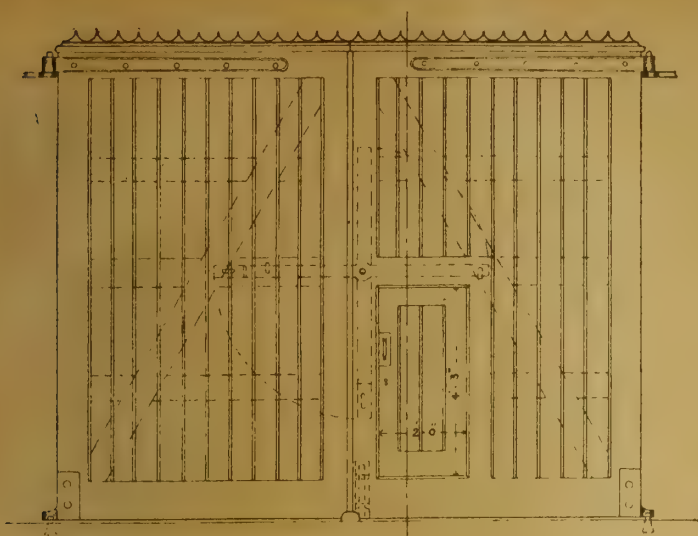
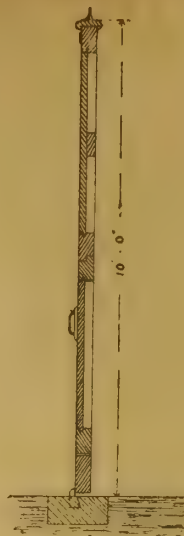


FIG. 135.



the upper part framed and panelled, the lower portion being filled in with match-boarding. It is, however, much more satisfactory to line the wall from the manger level to the top rail of the division with a non-absorbent material like glazed tiles, slate, &c., than with wood, as the latter material becomes impregnated with the moisture and organic matters given off by the horse during respiration. Stall No. 2 is provided with a slate

FIG. 136.

FIG. 137.

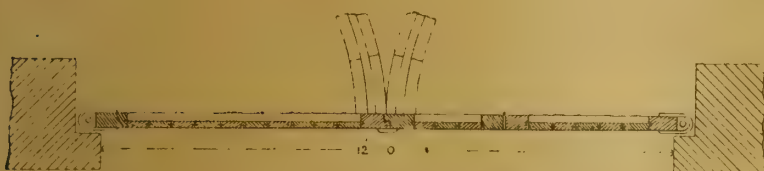


FIG. 133.

horses. Sections of iron mouldings and cappings as generally used for this purpose are shown in Figs. 136 to 140. The remaining portion of the walls should be plastered and distempered in some suitable shade of colour.

In the selection of glazed wall-tiles care should be taken to avoid all glaring colours, as the reflected rays of light from such surfaces are injurious to the horses' eyesight. For this reason white glazed tiles should not be used except in

advantage of not presenting a smooth, polished surface like porcelain tiles. They are, however, very thin and brittle, and are easily broken unless carefully bedded and pointed in cement.

The woods in most general use for lining the walls are red deal, pitch-pine, oak, and teak. For first-rate work teak is recommended; but where oak or teak cannot be used on the ground of expense, then pitch-pine is to be preferred. The surface of the woodwork should be well sized

slab fixed directly over the manger, thus affording an impermeable surface near the horse's head which can be easily kept clean, and does not absorb the moisture or other impurities from the animal's breath.

The portion of wall between the manger and top rail of the divisions to stall No. 3 is lined with hexagonal glazed tiles. In buildings of an expensive character these are arranged in the form of a panel with a border of ornamental tiles. The walls of loose-box No. 4 are finished with wall-boarding to the height of the manger, whilst the space between the manger level and the top rail of the divisions is lined with square glazed wall-tiles. A good appearance is obtained by such a mode of treatment.

The walls of the passages or gangways are either finished with boarding, as shown on the end wall adjoining loose-box No. 1 (Fig. 141), or lined with glazed tiles, as indicated at the gangway near loose-box No. 4. The former method is preferred, as the wall-tiles near the floor are liable to be greatly damaged by the constant passing of horses and stable-men.

The small portion of wall under the mangers of

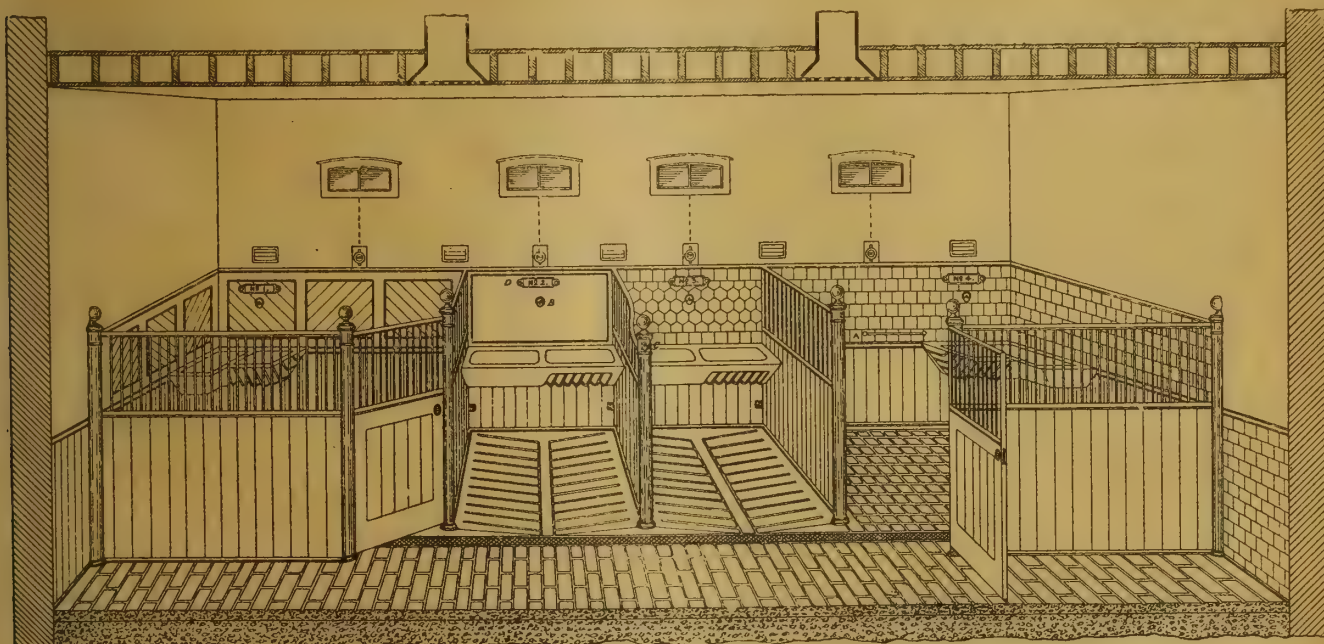


FIG. 141.

badly-lighted stables. The most suitable colours are French grey, olive-green, turquoise, pea-green, &c. They may be obtained either square, hexagon, or octagon in shape, and are frequently fixed with an ornamental border around them.

Wall-tiles of opaque glass with a dull roughened surface are now manufactured, and are sometimes used instead of the ordinary glazed tiles. They are quite impervious to moisture, and have the

and afterwards varnished with two coats of best copal varnish.

Fig. 141 is the sketch of a stable interior showing various alternative arrangements which may be adopted in finishing the walls of loose-boxes, stalls, and gangways. Loose-box No. 1 is shown lined with wood to the full height of the division. To improve the general appearance a middle rail is inserted at the manger level, and

the stalls is sometimes rendered smooth with Portland cement instead of being lined with wood, the finished surface being afterwards painted or colour-washed. Where ordinary manger fittings are used, a horse when lying down will occasionally be found resting with his head quite under the manger, and in such a position that on suddenly rising he may be seriously hurt by coming in contact with the



under side of the manger. To prevent accidents of this description the space is frequently boarded in flush with the front of the fittings. An alternative method consists in forming a

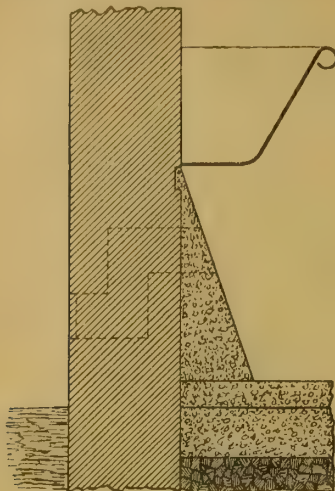


FIG. 142.

concrete ramp or slope under the manger, as shown in Fig. 142, the face of the concrete being rendered perfectly smooth with cement.

#### STUART'S GRANOLITHIC STONE.

A NEW illustrated catalogue has been brought out by the Stuart's Granolithic Stone Co., Ltd., of Regent Dock, Limehouse, E., in which their system of fireproof construction is illustrated and described. The work is handsomely got up and illustrated by photo-prints of the Granolithic Stone Works on the Thames, with views of the stone depot, moulding shop, crushing mills at Dalbeattie, N.B., quarries, &c., and drawings and details of the fireproof flooring as carried out at Messrs. Leach and Co.'s new offices and warehouse, Tooley-street, and various buildings. A Granolithic fireproof slab 19ft. by 13ft. and 3in. thick, carrying a load of 63 tons without breaking, is illustrated by a photograph; also a Granolithic fireproof arch of 9ft. span and 9in. rise, with a thickness at crown of 1½ in., which carries a load of 40 tons. Other experimental results are shown by large photo-tints and by carefully-scaled sections of slabs and arches, with the results appended, which will be found useful for architects' reference. One flat arch for corridor, 10ft. span, gave a distributed safe load of 2½ cwt. per square foot, the slab being only 4½ in. thick. We notice also illustrations of staircases constructed of Stuart's Granolithic for the Commercial Sale Rooms; views also of the Manchester Technical School, where the staircases are of the same system, and the New Municipal Schools, Birmingham, which have the staircases and floors constructed of Stuart's. Views are given of the saloons and grand halls of Messrs. Jenner's warehouse, Edinburgh; of Selwyn College, Cambridge, designed by Sir Arthur Blomfield; of town hall and offices, Hotel Metropole, &c., Brighton; Technical Schools, West Ham—in all of which buildings Stuart's system has been used for floors, corridors, staircases, casings of columns, &c. The examples and details are a valuable record of the great strength and fireproof facilities possessed by the Granolithic system.

#### BOOKS RECEIVED.

*Bell's Cathedral Series*, edited by GLEESON WHITE and EDWARD F. STRANGE. *The Cathedral Church of Rochester*, by G. H. PALMER, B.A. (London: George Bell and Sons).—We have already noticed the handbooks of Canterbury and Salisbury Cathedrals. The present volume is uniform, neatly bound in cloth, and in a brief popular form epitomises the principal sources of information. The author has consulted the works of the Rev. G. M. Livett, Mr. W. H. St. John Hope, Canon Scott, Robertson, and others. The illustrations have been chiefly reproduced from pen-drawings by Messrs. H. P. Clifford and R. J. Beale, and from photographs. Amongst these is a good illustration of the West Doorway from a

drawing by Mr. Clifford, and views of the cathedral from photographs by Messrs. Carl Norman and Co., including a north-east view, view of the choir, the richly-carved Chapter House doorway. The views from old engravings are interesting. The descriptive portion of the book furnishes all the salient events and episodes connected with the history of the cathedral and its various parts. The church has undergone many vicissitudes, and troublous times fell on it soon after its erection. Rochester claims to be the second oldest of English bishoprics, and was founded by St. Augustine. Many successive buildings have occupied this site. The Saxon cathedral, remains of which were discovered in 1889 during the underpinning of the west front, and revealed an apse; Norman and subsequent additions are recorded. Sir G. G. Scott was employed in restoring, and many interesting facts are given. Mr. Pearson has been lately intrusted to restore the cathedral and west front, and here, as at Peterborough, the facing has been found to have separated from the core. The general reader who is visiting this cathedral will find a serviceable guide to the church and measurements in this little book. A plan is given.—*The Cathedral Church of Oxford*, by the Rev. PERCY DEARMER, M.A., is another of the series, and the author has brought together from his own personal knowledge many facts and discoveries which have served to throw a new light on this church. For this purpose he uses not only the old sources, but the discoveries of Mr. Park Harrison and his pamphlets on the "Pre-Norman Date of the Choir" and the "Account of the Discovery of the Remains of Three Apses." The author expresses his thanks to several gentlemen, including Prof. York Powell, Cecil Norman, and to R. Phené Spiers and others for permission to reproduce drawings and photographs, which are reliable and well printed.

#### THE SURVEYORS' INSTITUTION.

PROFESSIONAL EXAMINATIONS, 1897.

THE following Student Candidates have passed the Examination for the Professional Associateship:—

John Heathcote Addie, Powis Castle Park, Welshpool, Mon.; Bernard Beresford Baddeley, Lakefield, Woodberry Down, Finsbury Park, N.; Joseph Grant Bickford (Special Prize, 1897), 23, Charleville-road, West Kensington, W.; Harry Bowden, Newport, Barnstaple, Devonshire; William Newbegin Brackett, Orsett, Grays, Essex; Henry Herbert Philip Burgess, 127, Fordwych-road, Brondesbury, N.W.; Frank Herbert Burrows, Elwick House, Ashford, Kent; Campbell Featherstone Cargill, Masham, Yorkshire; Charles Wentworth Clarke, 1, Park-place, Leeds, Yorks; William Clarkson, jun., 136, High-street, Poplar, E.; William Denton, Raisin Hall, Wadley Bridge, Sheffield; John Harlow Dunt, 16, Dafoen-road, Upper Tooting, S.W.; Arnold Elliott, Tokenbury, Liskeard, Cornwall; Alfred Cave Ellis, 21, West Hill, Highgate, N.; John Harris Furnedge, Middleton Stoney, Bicester, Oxon; Alfred Edward Gayer, St. Matthew's Vicarage, Cotham Park, Bristol; Douglas Fleet Goldsmith, Blendworth, Horndean, Hants; Horace Norman Gray, Newlyn House, 131, Earham Grove, Forest Gate, E.; Henry Beauchamp Harrison, 2, Belgrave Villas, Chippendale, Wilts; Arthur Frank Howland, Rushy Mead, Coleshill, Amersham, Bucks; John Murray Kerr (Institution Prize, 1897), Somerfield Park, Llandidies; Henry James Treleven Kibblewhite, 14, Grove Terrace, Highgate-road, N.W.; Ernest George Lomax, Chapel House, Allen-street, Kensington, W.; Harry Mitcheson, 9, Carlisle-street, Dresden, Stoke-on-Trent; Frank Eustace Molyneux, The Elms, St. Peter's-road, South Croydon; William Paice, The Limes, Egham, Surrey; Philip Peebles, Northfield, Albury, Surrey; James Reginald Pinegar, Chelworth, Crudwell, Wiltshire; Francis Arthur Pinfold, 191, Prince of Wales-road, Havestock Hill, N.W.; Capel Hereward Price, 89, St. Paul's-road, Camden Town, N.W.; Ralph Eteson Robinson, 29, Beacon Hill, Camden-road, N.; Leslie Shepherd Simpson, The Ferns, Newport Pagnell, Bucks; Frederick Charles Webster Stacey, 13, Camden-gardens, Shepherd's Bush, W.; Herbert Percy Stimson, 340, Brixton-road, S.W.; Hugh Charles Stokes, 49, Upper Baker-street, Marylebone, W.; Edgar Thomas Walton, 1, Crowhurst-road, Brixton, S.W.; Horace Clare Waterfield, 30, Prince's-square, Bayswater, W. (Cirencester); James Percy Wilton, 133, Harrington-road, Sefton Park, Liverpool; Ernest Beresford FitzHerbert Wright, The Rock Cottage, Leek Wootton, Warwick.

The following Non-Student Candidates have also passed the Examination for the Professional Associateship:—

Frank Sefton Appleby, 3, Lawrence-road, Wavertree, Liverpool; Francis Rion Benson, Harnage House, near Shrewsbury; Lionel Thurstield Bigg, Stratfield Saye, Mortimer, Berks; John Bowyer Bird, 26, Harrington-gardens, South Kensington, S.W. (Cirencester); Charles Blackshaw, 71, Angell-road, Brixton, S.W.; Edwin Holmes Blake, 1, Rowfant-road, Tooting, S.W.; Charles Butler, Rose Leigh, Alcombury, Huddersfield, Yorks; Harold Carmichael, 106, Cromford-road, West Dulwich, S.E.; Charles Langa Cassin, 94, Catford-hill, S.E.; George Chipp, c.o. A. H. Kerr, Esq., Beak-street, York; Henry Alexander Cobbe, Birdsall Grange, York; Frederick Roper Cooke, Rock Cottage, Leek Wootton, Warwick; William George Cope, 8, Orchard-street, Portman-square,

W.; Thomas James Councell, 44, Lorrimer-square, Kennington Park, S.E.; William Thomas Creswell, Royal Engineers, North Camp, Aldershot; Charles Tyler Cronk, 37, Royal-avenue, Chelsea, S.W.; Charles Osmon Cushen, The Rookery, George-lane, Woodford, Essex; Charles John Thomas Dadd, 20, Limesford-road, Waverley Park, S.E.; Thomas Samuel Dangerfield, 14, St. George's-terrace, South Kensington, S.W.; Richard Bruce Davidson, St. John's Villa, 102, Prescot-road, St. Helen's, Lancashire; Bernard Moxon Douglas, Pyes Hall, Wrentham, Suffolk; William Augustus Farnham, 16, Arneway-street, Westminster, S.W.; Ernest Greenwood, 97, Sheen-road, Richmond, Surrey; John Edward Harrison, Estate Office, Allotree, near Derby; Thomas William Alfred Hayward, Lynton Villa, Weston-super-Mare, Somersetshire; William Alfred Head, Norfolk Lodge, Fentimans-road, Clapham, S.W.; Herbert Oliver Holbrow, The Acacias, Staple Hill, Bristol; Harry Labron Johnson, Bella Riva, New Brighton, Cheshire; Wyndham Perse Knatchbull, Cotuams, Hollingbourne, Kent; William Beaumont Leather, The Hollies, Clarendon-road, Leeds; Albert Wilson Lofthouse, The Croft, Lintorpe, Middlesbrough, Yorkshire; Hector Jan Maxwell Mackenzie, Merton, Thetford, Norfolk; Robert Charles Marchant, 19, Wellington Park, Clifton, Bristol (Cirencester); Charles Millard Mayne, 158, Earl's Court-road, S.W.; Robert Mathewson Ogilvie, 10, Bolstro-road, Hayward's Heath, Sussex; Arthur Charles Parnacott, The Ferns, 15, Laurel-grove, Penge, S.E.; Henry McArthur Peppercorne, South-Eastern Agricultural College, Wye, Kent; Percy Edward Ridley, 43, Gorse-road, Wandsworth Common, S.W.; Theodore Richard Robinson, South-Eastern Agricultural College, Wye, Kent; Frederick Charles Ruddle, 19, Beresford-road, Highbury, N.; Beville Molesworth St. Aubyn, Clowance, near Camborne, Cornwall; Harold Crossley Salt, Milner Field, Bingley, Yorkshire (Cirencester); Alfred Sydney Ed. Sedgwick, 195, Tulse Hill, S.E.; Robert Harold Seel, 38, Conway-road, Cardiff, South Wales; Harry Shearburn, Collingham, Newark; James Hugh Shearer, 8, Bartholomew-terrace, Exeter, Devon; Charles Ayre Mackenzie Skues, Hyatt View, Campden-road, South Croydon; Sydney Arthur Smith, Head Master's House, Maitland Park, N.W. (Driver Prize, 1897, and Penfold Silver Medal, 1897); Henry Cyprian Snow, Holmedale, Stonegate, Leicester; John Charles Southcombe, Church Gate House, Barnstable, Devonshire; George Stanford, 20, Waldeck-road, Ealing, W.; Edward Russell Stoneham, Orchard House, Erith, Kent; Bruce Swanwick, Royal Agricultural College, Cirencester; Harold Stuart Thompson, c.o. R. E. Couchman, Esq., 35, Paradise-street, Birmingham; Alfred Frederick Aldridge Trehearne, 81, Upper Richmond-road, Putney, S.W.; Benjamin Franklin Turner, South-Eastern Agricultural College, Wye, Kent; Drysdale Turner, South-Eastern Agricultural College, Wye, Kent; Herbert Turner, Plasterton-avenue, Cardiff, South Wales; Leonard James Veit, Borough Surveyor's Office, Wolverhampton; James Weatheritt, 77, Lancaster-street, Southwark, S.E.; James Scott Weir, 42, Broughton-road, South Shields; Daniel Smith Williams, Woodland-villa, Mountain Ash, South Wales; Robert Stephenson Wood, The Estate Office, Lowther, Penrith, Cumberland; John Frederic Hulton Wrighton, The College of Agriculture, Downton, Wilts; Thomas John Young, South-Eastern Agricultural College, Wye, Kent.

The following Professional Associates have passed the Fellowship Examination in Division IV:—

Percy Allen, Warrington House, Duppas Hill, Croydon; Leonard Thomas Ashenden, 29, High-street, Canterbury, Kent; Harold Bentley, Percy Lodge, Teddington; Herbert George William Brinsley, Belmont, The Avenue, Gipsy Hill, S.E.; Walter Theodore Cox, Belmont, College-road, Maidstone, Kent; Henry Wilkinson Daniel, The Firs, Ashby-road, Burton-on-Trent; William Easter, Wiggshall St. German, King's Lynn, Norfolk; Herbert Philips Fletcher, 29, New Bridge-street, Ludgate-circus, E.C.; Edward Charles Foster, 64, Pall Mall, S.W.; Thomas Smellie Fraser, 209, St. Vincent-street, Glasgow; John Stanley Garner, 159, High-street, Uxbridge, Middlesex; Arthur Goulding, 41, Moorgate-street, E.C.; Edmund Horace Green, 28 and 29, St. Swinith's-lane, E.C.; Frederick Algernon Green (Penfold Gold Medal, 1897), 28 and 29, St. Swinith's-lane, E.C.; John Herbert Hall, Penkstone House, Middlewich, Cheshire; Holland Charles Heasler, Verandah Cottage, Hill Rise, Richmond, Surrey; Hubert Franklin Homan, 142, Eastgate, Rochester, Kent; Edgar Wilfred Hooper, 153, High-street, Huntingdon; William Jarman, 140, Wightman-road, Hornsey, N.; Arthur Pearce Jenkin, Twegrie, Redruth, Cornwall; William Jenner, 1, Western-road, Hove, Brighton; Percy Hamilton Kingsford, 25, Clifton-gardens, Folkestone (Cirencester); Cuthbert Joseph Lake, Heage House, Crouch Hill, N.; Ernest Edward Arthur Lee, 3, Guildhall Chambers, 33, Basinghall-street, E.C.; John Archibald Lucas, Guildhall Chambers, High-street, Exeter, Devon; Alfred John Martin, 16, Duke-street, Chelmsford, Essex; Charles Edward Mercer, the Estate Office, South Eastern Railway, London Bridge, S.E.; Herbert Nuttall, 20, Market-street, Bury, Lancashire; Fred. W. Pearce, the District Council Office, Broadway, Wimbledon, S.W.; William Phillips, 79, Lisson Grove, Plymouth; Frederick Wyldborne Digby Pinney, 6, Waterloo-street, Birmingham; Charles Arthur Refell, Chestnuts, Goshall, Guildford, Surrey; Horace Mordaunt Rogers, Craigenen, Carlton-road, Putney Hill, S.W.; George Alexander Sexton, 119, Brondesbury-road, Kilburn, N.W.; Henry Herbert Skipper, 19, St. George's-avenue, Tufnell Park, N.; Charles Gordon Smith, 33, West Bank, Stamford Hill, N.; Joseph George Tate, The Mount, Peshurst Park, Tonbridge, Kent; William Selves Walker (Crawley Prize, 1897), 22, Moorgate-street, E.C.; John David Wallis, 20, Booth-street, Manchester; John Henry West Wheeler, 189, Fulham-road, South Kensington, S.W.; Ernest Victor Whitaker, Gorsty Villa, St. Peter's-road, St. Alban's; Percy Whitton, 6, Bishops-gate-street Without, E.C.

The following Candidates have passed the direct Fellowship Examination in Division V:—

Charles Harrison, 179, Horninglow-street, Burton-upon-Trent; Walter Dawson Hollis, 28, Park-row, Leeds, Yorkshire; Samuel Eveland Isted, Royal Engineer's Office, Ryde, Isle of Wight.



## OBITUARY.

WE regret to announce the death, at his residence at Ealing Dean, of Mr. ARTHUR BAKER, R.C.A., F.R.I.B.A., of Effingham House, Arundel-street, Strand, W.C., and Arvonian-buildings, Bangor, North Wales. Mr. Baker, who was in his 56th year, had been confined to his house since July last by dropsy, but was able to continue his drawings and professional work to within a short time of his death, which occurred on Thursday in last week. He was a pupil of the late Sir Gilbert Scott, R.A., at the time of whose death he was principal manager, and in that capacity was closely associated with the rebuilding of St. Mary Abbots, Kensington. After his employer's decease Mr. Baker commenced practice on his own account in Kensington, for a while in partnership with Mr. A. M. N. Burden, and in 1894 he removed to Effingham House, and entered into partnership with Mr. J. Turrill, as architects and surveyors. Among his works may be mentioned the church of St. Paul, Kensington, a building in the Later type of the Lancet period; the restoration of many churches in Wales, including those of Llanberis and Llansilin; the strengthening and underpinning of the tower of the Town Hall at Rhyl, parish rooms at Ealing and Highgate, and many residences. He superintended the repairs to, and published an illustrated monograph upon, the Elizabethan mansion, Plas Mawr, at Conway, near the official headquarters of the Royal Cambrian Academy, of which he has been for some years a full member. He was alike skilful with pen and pencil, and devoted much study to archaeology as relating to historic mansions. During the past half-dozen years he had given considerable attention to sanitary matters, and contributed some time since a series of papers to the *BUILDING NEWS* on "Plumbing Specifications for Architects." His latest work as an architect, in conjunction with Mr. Turrill, the completion of St. Gabriel's Church, Pimlico, was illustrated in our issue of the 5th March last, and all the drawings shown on that double-page plate, with many others, were made while confined to the house by the illness to which he eventually succumbed. He was one of the diocesan surveyors for London, a member of the rural-decanal council, and a sidesman of St. John's Church, Ealing. He joined the Architectural Association in 1884, and four years later became a Fellow of the Royal Institute of British Architects, and during the past year has served as a member of the science standing committee of the latter body. His wife pre-deceased him by about five years, leaving an only daughter, who is married to Mr. Baker's former pupil and partner at Bangor, Mr. Harold Turner.

Mr. WILLIAM E. WORTHEN, New York, a well-known American civil engineer, died a fortnight since. Mr. Worthen was a native of Amesbury, Mass., and a graduate of Harvard University. On the completion of his college course, he studied engineering under George R. Baldwin, and, later, under the late James B. Francis, devoting himself at that time particularly to hydraulic work. In 1849 he went to New York, and was appointed engineer of the New York and New Haven Railroad, becoming vice-president of the corporation five years later. His reputation as a most accomplished engineer became widespread, and he was consulted on problems of a most diverse character. From 1866 to 1869, he was sanitary engineer of the Metropolitan Board of Health of New York; he was engineer to the first Rapid Transit Commission for the Annexed District, and himself the author of a plan for rapid transit for the whole city. He was also consulting engineer in the preparation of the plans for draining the City of Chicago to the Mississippi River, and in many sewerage and water-supply undertakings.

A large block of board schools is approaching completion at Mount Pleasant, Southampton. The architect is Mr. J. H. Blizard, of that town, and the contractors are Messrs. H. Stevens and Co. The cost of the schools is estimated at about £18,500.

The tenure of the tenants of the old buildings which extend from the plateau of the free library and museum to the corner of William Brown-street and Byrom-street, Liverpool, came to an end on Friday, and soon the structures which have stood for over half a century will be swept away to make room for the new technical college and an extension of the museum, to be built from the designs of Mr. E. W. Mountford, F.R.I.B.A., of London.

## Engineering Notes.

**BLACKWALL TUNNEL.**—The tunnel between Blackwall and East Greenwich will be opened by the Prince of Wales, who will be accompanied by the Duke of York, on Saturday, the 22nd inst. The tunnel has taken upwards of five years to build, the first cutting being made in March, 1892. It measures 6,200ft., or about a mile and a quarter, from one approach to the other. The tunnel proper is within a few yards of a mile long, each of the approaches measuring 800ft. In its construction cast iron has been substituted for brickwork. The work was mostly done in compressed air at a pressure of 36lb. to the square inch. From the surface of the Thames at high tide to the bottom of the tunnel the distance is about 80ft., the gradient of the approaches being 1 in 36. There will be a 16ft. roadway and two footpaths, each 3ft. in width. The total cost to the London County Council has been a million and a quarter sterling. The work has been carried out by Messrs. Penn and Sons, from plans by Mr. Alexander R. Binnie; Mr. Fitzmaurice has been the resident engineer.

**SOCIETY OF ENGINEERS.**—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, a paper was read by Mr. Henry O'Connor (vice-president), entitled "Automatic Gas Station Governors." The author first explained the need for the station governor in gasworks, and pointed out that the pattern now in use and being manufactured by many firms was practically the same as that made 50 years ago. He then described the working and the method of finding the weights necessary for throwing certain pressures, and proceeded to explain the necessity of the parabolic form of cone. He then described the most notable of the suggestions made from time to time to improve the working of the governors, such as the double cone governor, the equilibrium single cone governor, the governor with a separate loading bell worked at a distance from the cone bell, water-loaded governors, the double bell and cone equilibrium governor, the throttle valve governor, and governors with parallel side valves. The use of clockwork for the purpose of regulating the time of the loading and unloading of the bell was noticed, and also the loss due to uneven pressures. A new method of automatically loading governors according to the absolute requirements of the district was described with details of several ways in which that might be carried out. The advantages of this system were pointed out, and a method of approximately registering the output of gas by the variations in pressure was suggested.

## CHIPS.

Messrs. John Symons and Son, of Blackwater, have been entrusted with carrying out extensive additions and alterations at "The Home of the Epiphany," Alverton, Truro, from plans and designs prepared by Mr. Swift, architect, of Truro.

The Verdin Technical Schools, Northwich, are being ventilated by means of Shorland's patent exhaust roof-ventilators and special inlet panels, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The townfolk of Morley have decided to celebrate the Diamond Jubilee by building, by subscription, a public library.

A native of Kilmarnock has intimated to Provost Mackay that he is prepared to erect and give to the town a new building at a cost of £8,000, to be used as a public library and museum. The building is to be erected on the site of the present library buildings at Elmbank.

A meeting of the executive committee of Peterborough Cathedral was held last week, when it was decided that the works at the north-west arch, estimated at £161 17s. 1d., should now, upon Mr. Pearson's advice, be proceeded with. The sub-committee were authorised to carry out such works as might be found necessary to the pinnacles of the north flanking tower and the roof of the north-west gable of the west front. These works and the repairs required to the north transept and the eastern chapel will necessitate an expenditure of at least £11,000; of this sum, some £2,600 has been received or promised.

In the matter of the application for discharge from bankruptcy of Alfred Bates and William Stevens (described in receiving order as Bates and Stevens), Windsor-road, Willesden-green, N.W., builders, the order of discharge has been suspended for two years, ending April 7, 1899.

## Building Intelligence.

**BURLEY, LEEDS.**—The memorial stones of a new Wesleyan chapel and schools were laid on Saturday in Cardigan-lane, Burley, near Leeds. The premises have been designed by Mr. G. F. Danby, architect, of Leeds. They comprise a chapel, schoolroom, infants' room, church parlour, ministers' room, and twelve classrooms. The style is Decorated Gothic. The chapel is being built of stone, lined with brick, while all the internal woodwork will be of pitch-pine. At the south-east corner a tower and spire will rise to a height of 110ft. Inside the tower there will be a stone staircase leading to the gallery in the chapel, and a similar staircase will be provided at the opposite corner of the building. The chapel is to be 84ft. long, 48ft. wide, and 57ft. across the transepts. Accommodation will be provided for 480 persons on the ground floor, and for 320 in the gallery. The chancel will be separated from the chapel by a moulded arch, supported on granite columns, with carved bases and capitals. At this end of the chapel there will be a traceried circular window, filled with stained glass. The open-timbered roof will, in the centre, rise to a height of 40ft. In heating, the low-pressure hot-water system is to be applied. The contracts at present let amount to about £6,000. The contractors are: Mr. C. Myers, masonry; Messrs. Ledgerd and Son, joinery; Mr. H. Boston, plumbing and glazing; and Messrs. J. Atkinson and Son, slating.

**CHILCOMB.**—All Saints' Church, Chilcomb, was consecrated by the Bishop of Guildford last week. The first part of the church was dedicated on Ascension Day, 1890. On Good Friday, 1891, the second part of the church, consisting of the nave and north aisle, with a roughly-boarded east end, was first used for Divine service. The chancel has now been built, but eventually a tower and vestries will have to be added. The church, which is of simple 13th century character, consists at present of a nave 61ft. long by 23ft. wide, side aisle 80ft. long and 21ft. wide, and chancel 38ft. long and 22ft. wide. The altar is raised seven steps above the nave. Mr. J. L. Pearson, R.A., was the architect. The fittings of the altar, rails, desks, and the panelling at the east end are all made of oak which was taken from the nave roof of Winchester Cathedral, and was given by the Dean and Chapter. This woodwork was made from designs by Mr. G. H. Kitchin.

**LONGCOTT.**—The church of St. Mary the Virgin, Longcott, was reopened last week by the Bishop of Reading after complete restoration. One of the most important changes has been the entire removal of the south aisle, built 50 years ago, the walls, owing to faulty foundation, having displayed ominous cracks. The arcade and columns have been taken away and a new south wall erected. The chancel arch has been widened, and the entire slating of the chancel and nave has been removed, the timber repaired, a covering of felt supplied, and the stone slates replaced. The chancel aisle has been laid with squares of Portland stone. The chancel has been refurbished by the nephews and nieces of the late Rev. John Hughes, who was vicar for 43 years. A conspicuous feature is a new holy table carved in oak, and there are new choir-stalls, sedilia, credence table, and communion rails. In the nave the old high-backed seats have been cut down and remodelled, and the floor beneath has been laid with blocks of pitch pine. The old gallery at the west end has been removed, and the Norman arch leading into the tower is thus brought into view. In addition to all this, the old pulpit has been placed upon a new oaken base, and the ceiling of the nave has been laid out in panels. The whole of the interior has been replastered and coloured. During the alterations most of the walls had to be underpinned and a portion of the east wall rebuilt. The cost of the whole work was about £1,050. The restoration has been carried out under the direction of Mr. J. Oldrid Scott.

**PENKHULL, STOKE-ON-TRENT.**—A new board school, erected at Penkhull for the Stoke-on-Trent U.D. School Board, was opened on Monday last. The school occupies the junction of Princes-road and Penkhull-street. It provides accommodation for 470 children, and is a mixed school on the central-hall plan, arranged for extension by the addition of three classrooms at the northern



end of the central hall, which will then make the total accommodation 660. The exterior is marked by two towers over the entrances, with carved cement friezes, the rest of the work being of a simple character in brick, with stone sparingly used for heads, sills, and gable moulds. The walls inside are plastered, and have tiled dadoes, specially designed by Messrs. Minton, Hollins, and Co. The school has been furnished by the Bennett Furnishing Co.; heating by Messrs. R. Dawson and Co., of Stalybridge. Messrs. R. Scrivener and Co., of Hanley, are the architects.—On the same day the new Deaf and Dumb Institute in the immediate vicinity was opened. The institute has been erected for a joint authority, also from the designs of Messrs. R. Scrivener and Sons, and is the first building in the United Kingdom planned and built under the Elementary Education (Deaf and Blind) Act, 1893. The total cost has been £20,000. The institution is built within the grounds of, and in it is incorporated, the mansion built in 1803 by Josiah Spode, the potter. The house is an oblong building, with a semicircular entrance of stone on its west front, above which is a lofty dome. The cupola has been retained, and two towers with domed caps are added on either side. The mansion itself has been converted into the administrative department of the school, the stable range to the northwards being the only part destroyed. There is a large central hall, with classrooms on either side for the deaf children, and running right and left are also corridors, terminated by the day-rooms for the deaf children. There is accommodation for 139 children, and the necessary teaching and servant staff. The principal contractors for the several works are as follows:—Buildings, part of fittings, gasworks, and water-mains, Mr. J. R. Yoxall, of Stoke; heating, Messrs. Dawson and Co., of Stalybridge; hot water, and painting to old portion, Messrs. J. Bickley and Co., of Hanley; engine and boiler, Messrs. Thomas Shore and Son, Hanley; school furniture, the Bennett Furnishing Company, of Glasgow; furniture for rest of institute, Messrs. George Fleet and Co., of Stoke; sanitary appliances, Twyford's, Limited, Hanley; tile dadoes, Messrs. Minton, Hollins, and Co., Stoke.

**SOUTHAMPTON**—The town council received at their last meeting a report from the Housing of the Working Classes Act Committee stating that the committee had had under consideration the joint reports of the Borough Engineer and Medical Officer of Health, with designs for buildings proposed to be erected as a municipal lodging-house, with frontages to Pepper-alley and Simnel-street. The committee resolved to adopt Scheme No. 2, and recommended that the town clerk be instructed to advertise for the temporary services of an architectural assistant in the borough engineer's department, at a salary of £3 3s. per week, competent to prepare elevations and sections, and all details in connection with the erection of municipal lodging-houses and artisans' dwellings. Alderman Tilling, in moving the reception of the report, said that the committee at first proposed that the whole of the site should be utilised for a municipal lodging-house for 297 lodgers, but this would entail a loss of £229 per annum, and the committee therefore abandoned the scheme. The scheme they now recommended was to build a municipal lodging-house on part of the site, and utilise the remaining portion of Simnel-street for artisans' dwellings. Alderman Bone said the whole scheme involved an expenditure of £21,000, and they ought to know something more about it before they adopted it. It was pointed out that the council were only asked to receive the report of the committee, and not to adopt it. On this understanding the proposition was carried.

**STOURTON, SOUTH LEEDS**—The corner-stone of a permanent structure, which will replace St. Andrew's mission church, was laid on Saturday. The new church will be in the Late 14th-Century style. It will be a brick building, with red Dumfries stone dressings on the outside, and with a roof of red Staffordshire tiles. The dressings in the interior will be of Harehills stone. The church will consist of a nave and aisle, chancel, organ chamber, vestry, and heating chamber. On the north side there will be a small chamber, providing accommodation for about 25 people. An octagonal turret will rise from the north-east corner of the nave. The aisles will be divided from the nave by two arcades of five arches each. Above these there will be a range of three-light traceried clerestory

windows. A large five-light east window, and clerestory windows on the north and south, will light the chancel. The chancel ceiling will be arched and panelled, and the roof of the nave will also be subdivided into panels. A floor of wood blocks, deal seats, and an altar made of oak complete the building. The estimated cost, including extras, is a little over £5,000. Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect, Mr. T. A. Bolton, of York, clerk of the works, and Mr. Isaac Gould, the contractor.

#### CHIPS.

The larger portion of the premises of Councillor J. R. Edwards, builder, Monnow-street, Monmouth, were burned out on Friday noon. On the same morning Mr. Edwards had received an anonymous threatening letter, and on the previous day the funeral had taken place of one of his children, who was run over and killed by a timber waggon earlier in last week.

A committee appointed to consider what form the Diamond Jubilee commemoration should take in Chelsea, has decided upon an annexe to the Free Library in the shape of a museum. It is estimated that the cost will be between £1,500 and £2,000.

The extensive premises of Messrs. Holmes and Co., patent firewood manufacturers, Hill-street, Peckham, were destroyed by fire on Tuesday afternoon.

A new English church was opened in Zurich on Sunday last. The building, which holds 300 people, and site have cost about £5,000. A chancel, at the cost of £1,000, was the gift of Captain Alcock, of Ashurst, Kent.

The Standing Orders Committee of the House of Commons refused leave, on Tuesday, to deposit a Bill for the Extension of the Victoria Embankment, from the Victoria Tower Gardens to the western end of Lambeth Bridge, and the construction of a new street 90ft. wide in connection with the improvement, notice of which had not been given in November.

Mr. E. H. Parry, of Stoke House, Bucks, one of the churchwardens of Stoke Poges, contradicts the report as to a proposed restoration of Stoke Poges Church. "A committee has," he says, "been formed to collect money for the purpose of shingling the spire, cleaning the interior, ventilating the church properly, &c.; but there is no idea whatever of doing anything that would involve any structural alteration."

The Building Clauses Committee of the Leeds Corporation have passed the plans for the new Empire Palace of Varieties, to be erected in Brig-gate, at the corner of Fleet-street, in that city. The syndicate propose making two arcades in place of Fleet-street and Cheapside, which are regarded as a vast improvement on the present roadways. In addition to the Empire Palace, the plans comprise the erection of 28 shops. The block of buildings will be bounded by Wood-street, Fleet-street, and Brig-gate, on three sides, and by an arcade, running from Wood-street to Fleet-street, on the east. The arcade will be about 70 yards from Brig-gate. Building operations will be commenced very shortly.

The sale of two collections of ancient and modern pictures took place at Messrs. Christie, Manson, and Woods' on Saturday. These were the pictures of the Early English, Old Italian, and Flemish schools formed by the late Mr. George Richmond, R.A., and a selection from the works of that artist; and a collection of a somewhat similar character dispersed by order of the executors of the late Sir John Millais, P.R.A. The Richmond collection comprised 90 lots, which realised a total of £8,672 16s.; the Millais property consisted of 25 lots only, and fetched a total of £10,968 14s.

The new church of St. Helena on Lundy Island will be dedicated by the Bishop of Exeter on June 17. The new church stands upon the top of treeless granite rocks, towering hundreds of feet above the picturesque cove, which, since the days of the ancient Britons, has formed the only landing-place. It is a Gothic edifice, designed by Mr. John Norton, F.R.I.B.A., of 95, Ridgmount-gardens, W.C., and is built largely of the capital grey granite the island is composed of. The sculptured marble reredos is the handiwork of Messrs. Harry Hems and Sons. The cost of the building has been £4,000.

Lady Rothschild has consented to lay, on June 9, the foundation-stone of the Acton Cottage Hospital, the site of which has been given by Lord Rothschild and Mr. Leopold de Rothschild, and the building by Mr. Passmore Edwards. Lord Rothschild will accompany Lady Rothschild.

The Duke of Norfolk has presented to the urban district council of Dorking eleven and a half acres of land, known as the Cotmandene, as a recreation ground in commemoration of the Queen's long reign.

#### COMPETITIONS.

**BATH ART GALLERY**.—Another change has taken place in the aspects of this scheme. At the last meeting of the building committee the Mayor of Bath, who presided, brought up the recommendation of the general committee in favour of the architect being chosen by open competition. The town clerk pointed out that Mr. J. M. Brydon, F.R.I.B.A., of London, had already prepared sketch plans for the building for the late Sir Jerom Murch. He thought, therefore, that Mr. Brydon should have been asked to meet that committee and talk the matter over as to arrangements to be made for the building, and then he should have been instructed to have prepared plans and specifications. After they had been approved, the architect should have been instructed to procure tenders, and then the whole thing could have been put before the public with the request for so much money. Mr. Palmer Hallett stated that five years ago Mr. Brydon prepared plans for this gallery in conjunction with the technical schools for the committee of the city council. A letter was read from Mr. Henry Overton Wills, of Weston, in which it was stated:—"Mr. Brydon (who is a perfect stranger to me) has already had to submit to competition and has come out twice successfully, and with different assessors on each occasion, and all that is now wanted is to ask him to finish his design, which was good enough to secure the suffrage of Mr. Waterhouse, R.A. I do not understand that those who want all this gone through again are prepared to pay for it. If so, well and good; but in the absence of this it strikes me that those who have contributed, and who utterly object to this waste of money, might do worse than withdraw their promises and contribute their money to other equally worthy objects in Bath, about which there can be no possible difference of opinion." After further discussion, it was unanimously resolved to recommend the general committee to empower the building committee to employ Mr. Brydon as architect for the art gallery and free library.

**KNARESBOROUGH, YORKSHIRE**.—Mr. W. D. Caroe has placed first the plans submitted by Mr. George H. Barrowcliff, architect, of Loughborough, in public competition, for the Knareborough Grammar School, designed to accommodate 100 scholars, 30 boarders, with head-master's house and a complete technical school, and the following extracts are from the assessor's report:—"The plan shows very considerable thought and skill, and is so well expressed that no report is necessary to explain it. The elevations submitted are probably the least costly of any, being simple and straightforward, and at the same time suitable. . . . I have called attention more fully in this case to the faults than in the others, inasmuch as the information may be useful to the author, who shows, I think, the best qualities of any competitor, to enable him to carry out a satisfactory building entirely re-planned, to suit less ambitious conditions, in accordance with the sum to be expended. I award that the £10 be paid to him, and recommend that he be consulted with a view to preparing an entirely new scheme."

Plans have now been adopted for the restoration of Bradford parish church, West Riding, as a memorial of the late Archbishop Bardsley. The estimated cost is £4,000, and towards this a sum of £2,328 is in hand or promised.

At the Liverpool Consistory Court, on Wednesday, before Chancellor Espin, the vicar of Mossley Hill was granted leave to place a stained-glass window in the north side of the chancel, to perpetuate the memory of the first vicar, Archdeacon Diggle. The window will represent the Vision of Isaiah, and the cost (£300) will be defrayed by voluntary contributions. The vicar and wardens of St. John the Baptist, Earlestown, sought leave to enlarge the church by continuing the nave and aisles westwards, building three additional bays; to build a tower on the north side of the addition, with a baptistery under, and remove the font thither to make provision for baptism by immersion; to renovate the organ; to erect a chancel-screen; to place a peal of bells in the tower; and to erect a west gallery. The vicar said that the total cost would be about £7,000, and that the church had already cost about £9,000. The registrar (Mr. Gamon) pointed out that the church could not have two fonts. The Chancellor said that was so. They must have either a font or tank—they could not have both; he was prepared to sanction the one or the other. A faculty would be granted, with the omission of the words, "to make provision for baptism by immersion."



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## ILLUSTRATIONS.

HAM HOUSE, PETERSHAM.—THE ELEANOR AND VICTORIA HOUSES AT THE PASSMORE EDWARDS COLONY FOR EPILEPTICS, CHALFONT ST. PETER'S.—STAFFORDSHIRE COUNTY COUNCIL TECHNICAL INSTRUCTION BUILDING, STAFFORD.—EIGHT COTTAGES AT SUTTON COLDFIELD.—SKETCHES OF CHAIRS FROM CHRISTIE'S.

## Our Illustrations.

HAM HOUSE, PETERSHAM.

SEE review of "The Architecture of the Renaissance," on page 658.

THE ELEANOR HOUSE COLONY FOR EPILEPTICS, CHALFONT ST. PETER'S, BUCKINGHAMSHIRE.

THE first home for women at this colony, founded by the National Society for the Employment of Epileptics, is another visible token of the benevolence of Mr. Passmore Edwards, who is bearing the entire cost. The building was opened by Mrs. Bayard yesterday. It is not a hospital, and is not planned as such; its inmates are not patients, but colonists, who, by reason of their being liable to occasional fits, are unable to find employment in the ordinary way. Stairs, however, are a danger;—all the main accommodation is on the ground floor, the upper floor being reserved for the bedrooms of the matron and the attendants, with bathroom and w.c., linen, box, and cistern-room. A large hall or common room, convenience of supervision, and ready access for the attendant in case of need are the chief points in the accommodation for the epileptics; simplicity and harmony with the country surroundings the aim in the treatment of the exterior. The walls and chimney-stacks are of red local bricks, the half-timber work of unwrought oak, the roofs are covered in the local red tiles, which rapidly gather the sober tones of age. The heating will be by open fires, protected by specially high fenders, reinforced by hot water in the hall, bathroom, lavatories, and linen-room. The plainness of the interior is relieved by a deep frieze in the hall, to be painted, from designs by the architect, Mr. Ernest C. Shearman, by members of the Kyrle Society.

THE VICTORIA HOUSE COLONY FOR EPILEPTICS, CHALFONT ST. PETER'S, BUCKINGHAMSHIRE.

YESTERDAY the Hon. T. F. Bayard, retiring Ambassador of the United States of America, laid, in connection with the Queen's Diamond Jubilee, the foundation-stone of this building on the eve of his departure from England, and this ceremony is Mr. Bayard's last public act of the kind in this country. The home is being erected at the cost of Mr. J. Passmore Edwards, who purchased and presented the extensive and beautiful estate of Skipplings Farm, now occupied by the colony founded by the National Society for the Employment of Epileptics at Chalfont St. Peter, Bucks. This building, one of a series already erected, or about to be commenced, is to be called "The Victoria House," for the reason suggested above. It furnishes accommodation for 24 men, all the patients'

rooms being contrived on the ground floor, and they are so arranged as to secure the maximum amount of sunshine and a good prospect, all the administrative departments being placed in secondary positions in this respect, in order to afford the greatest advantage to the residents. The dormitories are shut off from the day-rooms by a glazed screen situated in the main corridor, and they are so located that the attendant may have both wards under his direct observation; and, moreover, in this connection it is well to note that the inmates are able-bodied patients suffering from a malady which, though intermittent, necessitates continued supervision night and day. The kitchen is mainly required for ward and house purposes only, the meals being prepared in an administrative building, and for this purpose the patients' entrance is situate immediately in front of the refectory door for the ready delivery of dinners from the central kitchen. Upstairs the servants and matron are accommodated with a "special" ward, and attendants' room adjoining for occasional use. All the walls are of solid brickwork, with no timber divisions, and the through corridor, 5ft. 6in. wide, gives air and facilitates supervision. The plans and working drawings herewith reproduced, with two views, fully illustrate the arrangements. Red brick and stone is used for the walls, and red tiles for the roofs. The first-floor walls are externally rendered with lime stucco, and the gable timberings are of oak. Keene's cement dadoes will be used throughout. The builder is Mr. George Darlington, of Amersham. The architect is Mr. Maurice B. Adams, F.R.I.B.A., who has designed the homes for boys and for girls both about to be erected on the same estate near the Recreation Hall. The cost of these homes will be also paid by Mr. Passmore Edwards.

STAFFORDSHIRE COUNTY COUNCIL TECHNICAL INSTRUCTION BUILDING, STAFFORD.

THIS building, erected for the accommodation of the Technical Instruction Administration Staff and the County Technical Classes, is situated at the corner of Victoria-square and Earl-street, Stafford. The principal and official entrance is in Victoria-square, and has on the left a large committee-room and on the right a suite of four offices. The class-room entrance is in Earl-street, and immediately adjoining is the cookery class-room, with its scullery, and beyond this a wood-working shop and store-room for dairy and cookery utensils. The first floor contains a museum for the collection and exhibition of sanitary appliances; teaching laboratory for twenty students, fitted with fume closets, distillation chamber, sulphuretted-hydrogen closet and combustion hearth, drug store, special laboratory, balance-room, chemical lecture-room, with preparation-room adjoining, and science class-room. At the angle of the building is a masters' room with circular bay. On the second floor are a large art-room and a modelling-room, both lighted from the north, and a small room for preparing casts. Each floor has cloak-rooms and lavatories for the students. The basement contains large heating chamber and coal-store, and three well-lighted store-rooms. The buildings are of brick with thin Leicester brick facings and Hollington stone dressings, the roofs being covered with green Westmoreland slates. Internally the offices and committee-room are finished in plaster, and the class-rooms and staircase are distempered on the brickwork, with a salt glazed brick dado 4ft. high. The cost of the buildings, exclusive of electric lighting, furniture, and fittings, has been about £8,000, and the contract has been carried out by Mr. H. Lovatt, of Wolverhampton. The whole of the works have been completed from the plans of Messrs. Bailey and McConal, of Walsall, whose designs were selected in a competition limited to the county of Stafford. Mr. H. W. G. Tanner has acted as clerk of works.

COTTAGES AT SUTTON COLDFIELD, BIRMINGHAM.

THESE cottages, which are now nearing completion, are for Mr. Fredk. W. Brampton, J.P., Mayor of Sutton Coldfield. They are built in two blocks of four, and present a very pleasing appearance, both internally and externally, being of quaint style throughout. The main feature of the plan is the large living-room downstairs, which is 18ft. square, and there is also a bathroom in a convenient position on first floor. The amount of contract for building alone is £1,817, but to this must be added the cost of fencing and

the laying-out of grounds, &c. The work is being carried out by Messrs. James and Bird, of Sutton Coldfield, under the superintendence of the architect, Mr. William E. Healey, of the same town.

THREE CHAIRS, SKETCHED AT CHRISTIE'S.

THE high-back Chair, which forms the centre of our sheet of sketches, was one of a suite of seven which came from Conover Hall, Shrewsbury, a fine old mansion, recently owned by the late Mr. Reginald Cholmondeley. The suite was sold at Christie's for 116 guineas. The stamped leather of back and seat, fastened with large brass-headed nails, was in good condition. Chairs of this kind were made in Spain and Portugal during the 17th century, and we illustrated in the BUILDING NEWS for April 26, 1895, an arm-chair from the latter country, but where the legs were turned, and with a carved rail in front. Our present subject is evidently an adaptation of that form, the chief difference being in the Queen Anne character of the cabriole legs and rails. The total height is 4ft. 2in., the width at back 1ft. 5in., and width of seat in front 1ft. 8in. The other two chairs, commonly called Queen Anne, are later in date, belonging, in fact, to the Early Georgian period. They are both interesting, as showing the variety in shaping to be obtained in two pieces of furniture designed on the same lines. The woodwork is walnut, the knees of the left-hand chair with leather seat being richly carved with acanthus foliage, deeply cut at the edges, and the front rail ornamented by a shell in the centre, carving being further indulged in at the top, which rolls back slightly. Both seats were wide in front, measuring 1ft. 9½in. across.

## CHIPS.

Orders have been given for the foundation stone of the Cornwall Central Technical Schools, Truro, to be ready by May 25, when it will be laid by Mr. J. Passmore Edwards, the founder of the institution. By a remarkable coincidence, it was on May 24, 1895, that Mr. Passmore Edwards laid the foundation stone of what is practically the first wing of these buildings—Truro Free Library.

The Select Committee of the House of Commons, appointed to inquire into the administration and cost of the museums of the Science and Art Department, met again on Tuesday and Wednesday at Westminster. The greater part of the sittings was occupied with the examination of General Sir Robert Murdoch Smith, the director of the Edinburgh Museum of Science and Art.

The final stage of the restoration of the Church of St. Bartholomew-the-Great, which has been in progress from Mr. Aston Webb's designs for over 12 years, has at last been reached. The committee announce that the Lady Chapel is to be reopened on Tuesday week, the 18th inst, by the Bishop of London. A great effort is being made to enable the Bishop of London to announce that the chapel has been opened free of debt, but £400 is still required.

At St. Agnes' Church, Kennington, S.E., a carved crucifix, the figure of the suffering Christ being rather over quarter life size, has been presented. It is made entirely of Devonshire-grown oak. The sculptured figure of the crucified Lord is not stuck on to a detached cross, but the upright of the cross and the carved figure, and the title above, are part and parcel of the same tree, all fashioned out of the solid oak. It is the handiwork of Messrs. Harry Hems and Sons.

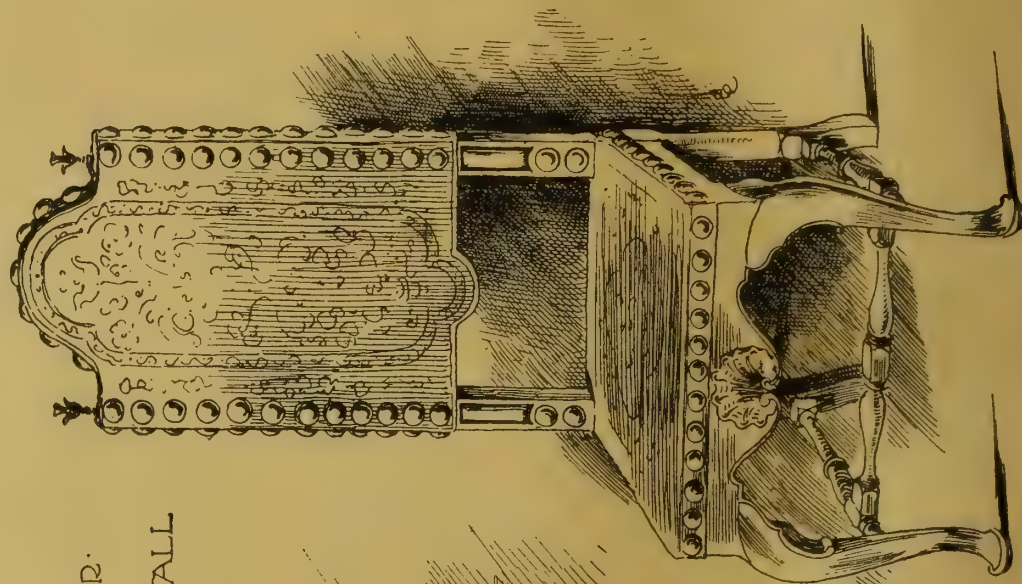
A stained-glass window, the work of Mr. Westlake, has just been placed in Cropredy church. The window, which is of two lights, is filled horizontally by two pictures from the eighth chapter of the Acts of the Apostles. In the upper one is seen St. Philip the Deacon baptising his converts "both men and women" at Samaria. In the other compartment are the Apostles St. Peter and St. John laying their hands in the rite of Confirmation on the same group. Behind them stands St. Philip as their deacon, holding a cross in his hand.

Professor W. B. Richmond, R.A., will deliver a lecture in the galleries of the Royal Society of British Artists to-morrow (Saturday) afternoon. He takes as his subject the mosaic decorations of St. Paul's Cathedral.

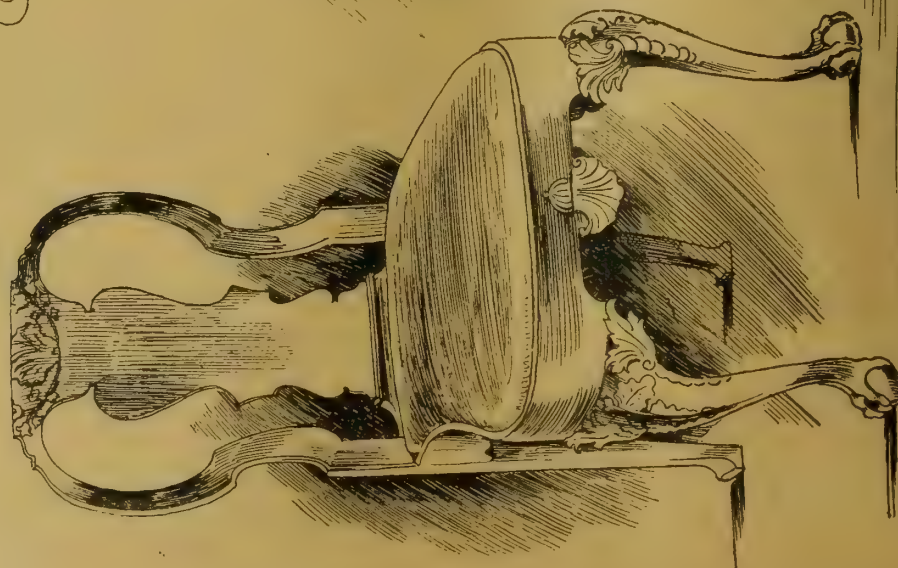
The annual meeting of the trustees of Shakespeare's Birthplace was held on Wednesday at Stratford-on-Avon. Sir Arthur Hodgson presided. The committee's report showed that various alterations and repairs had been carried out on the New Place Estate, Shakespeare's last residence, also at Anne Hathaway's cottage at Shottery, both of which properties are now, in addition to the birthplace, vested in the trustees. A number of rare books, proof engravings, &c., had been bequeathed during the year.



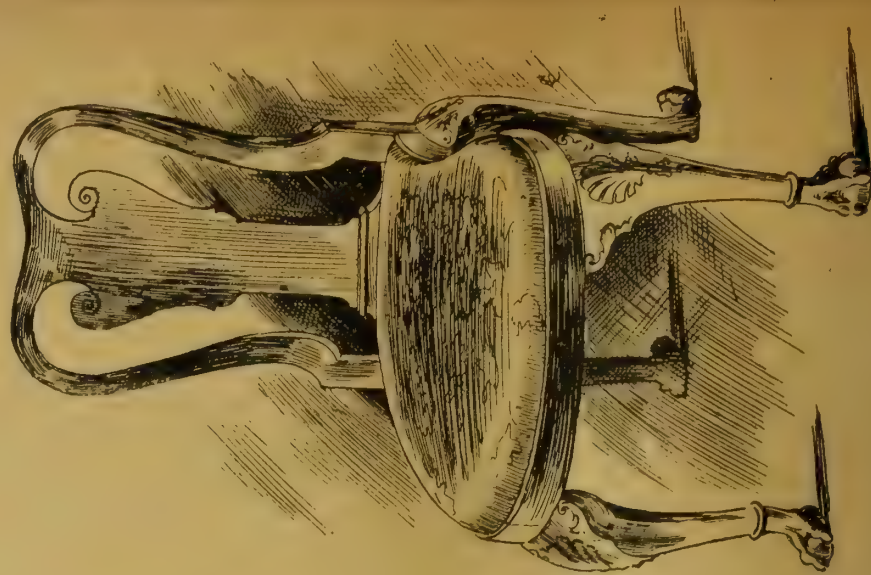
SKETCHES  
AT CHRISTIE'S SALE-ROOM



LEATHER-BACK CHAIR  
FROM  
CONDOVER HALL



QUEEN ANNE CHAIR  
WITH LEATHER SEAT

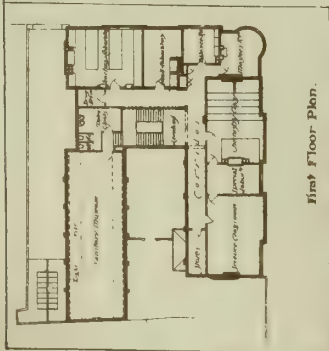


QUEEN ANNE CHAIR  
WITH TAPESTRY SEAT

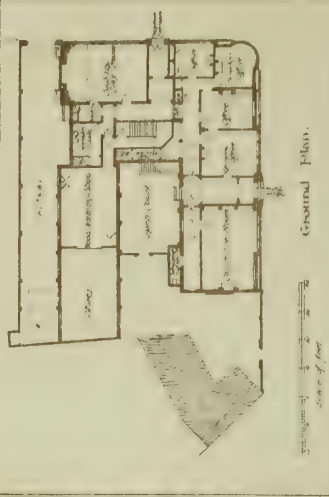








First Floor Plan.



Ground Floor.



STAFFORDSHIRE COUNTY COUNCIL TECHNICAL INSTRUCTION BUILDINGS, STAFFORD.  
BAILEY & M<sup>c</sup> CONNELL, ARCHITECTS.

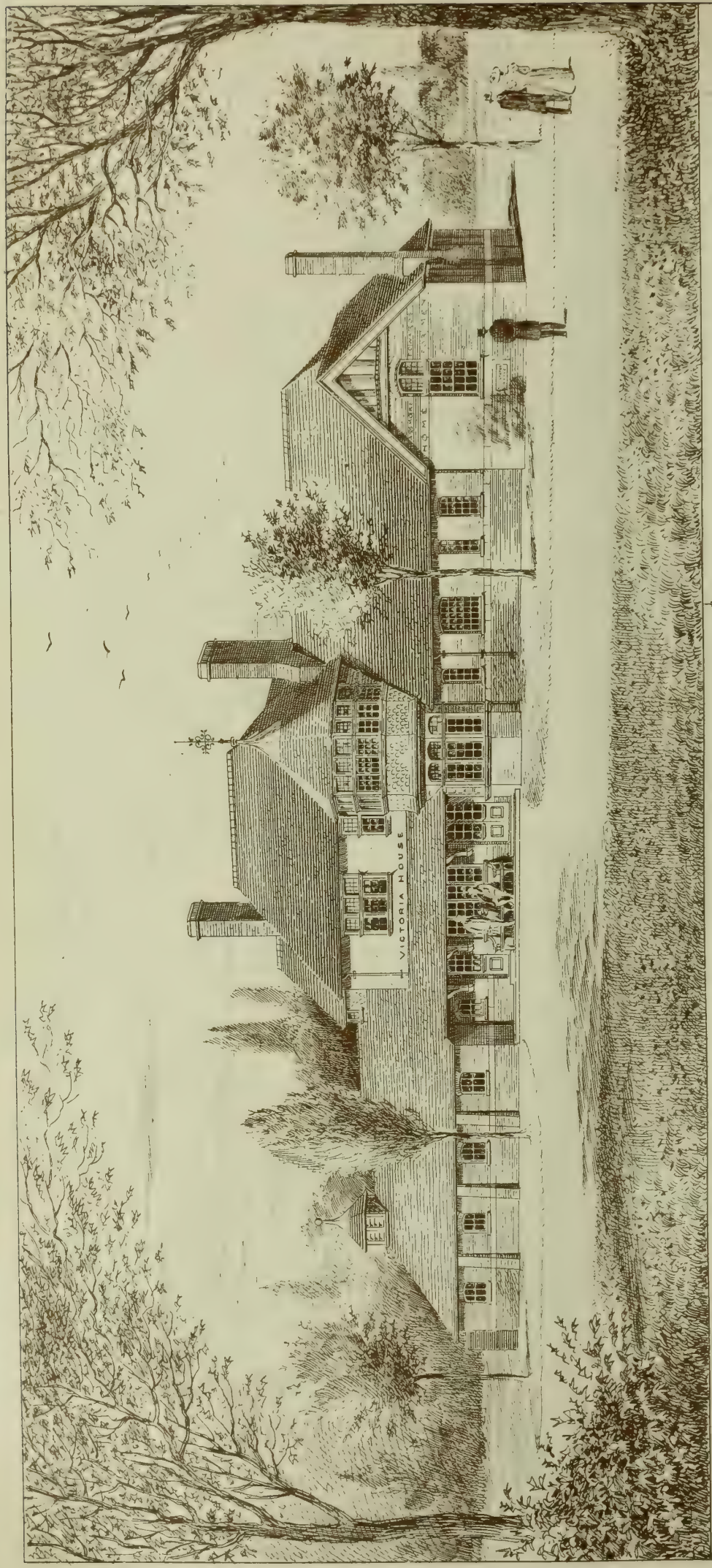
PHOTO TAKEN BY JAMES ALEXANDER & SONS, LONDON W.C.



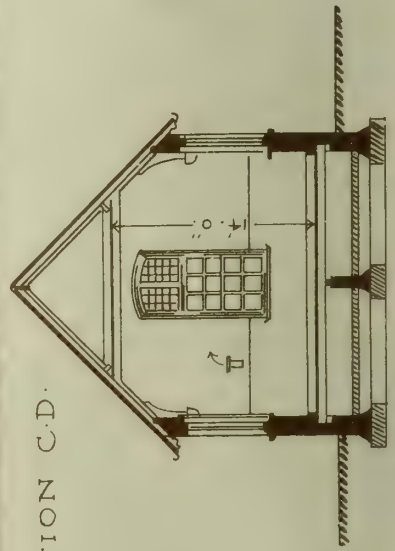




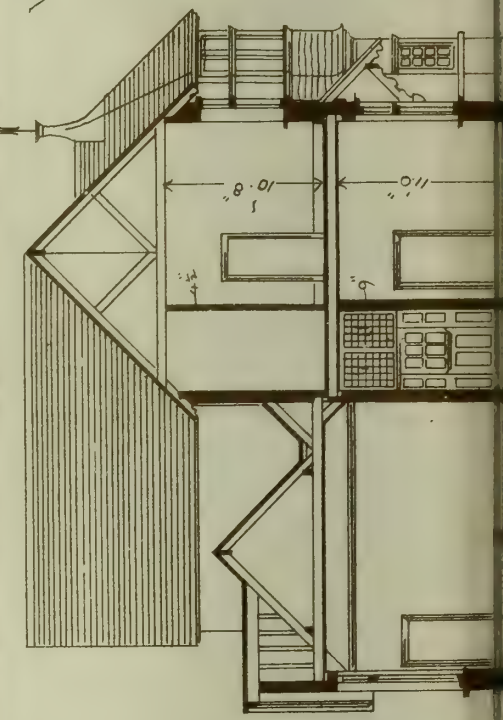
THE BUILDING DEWS, MAY 7, 1897.



SECTION C.D.



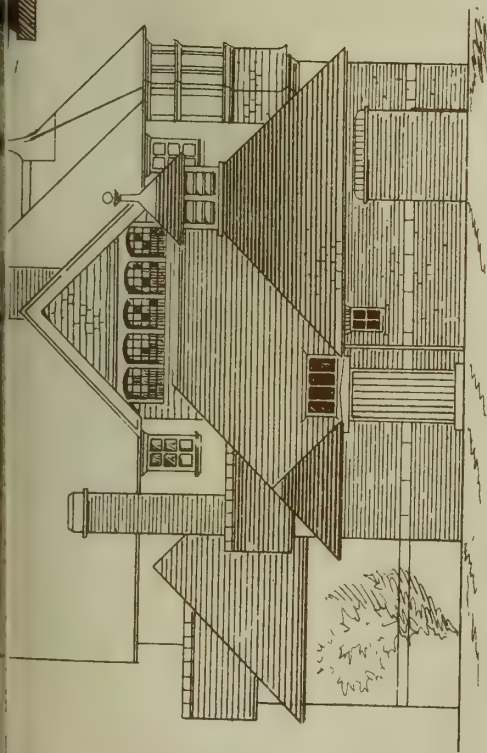
VIEW FROM N.E.



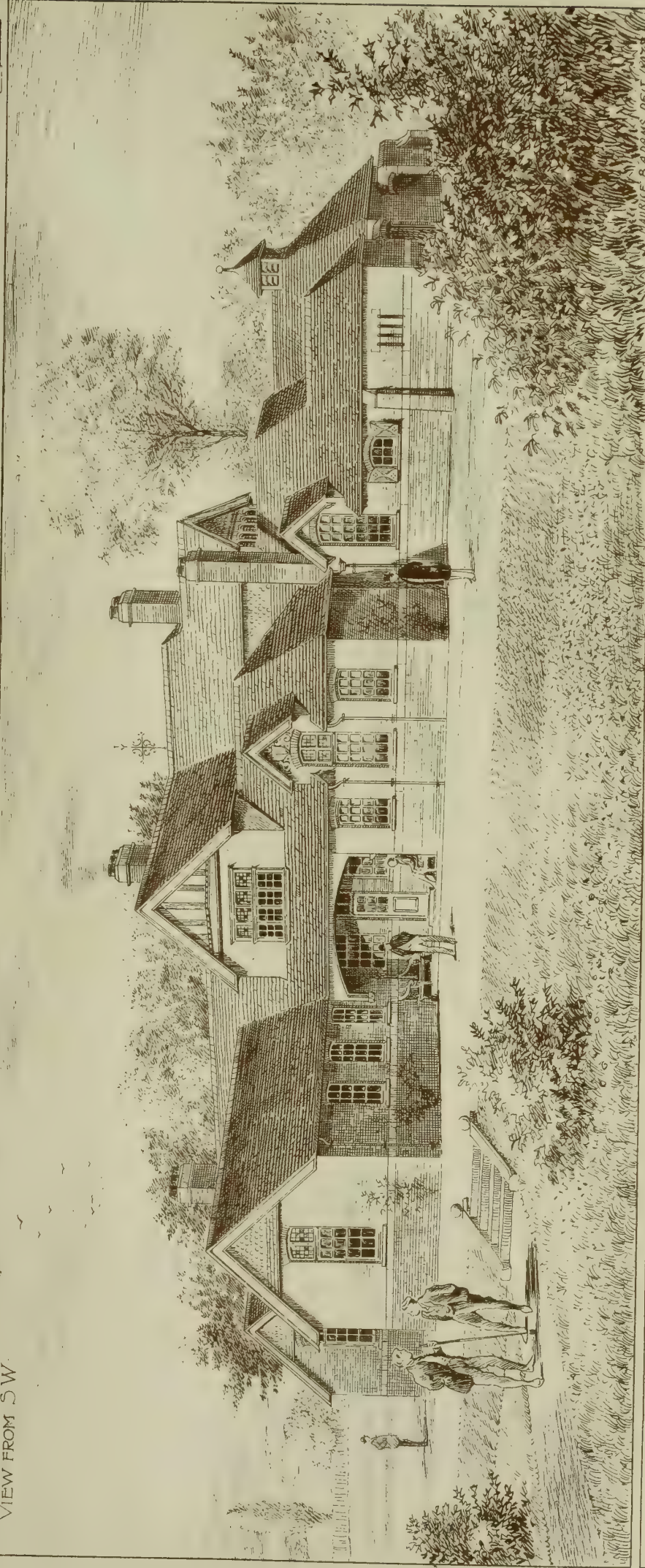
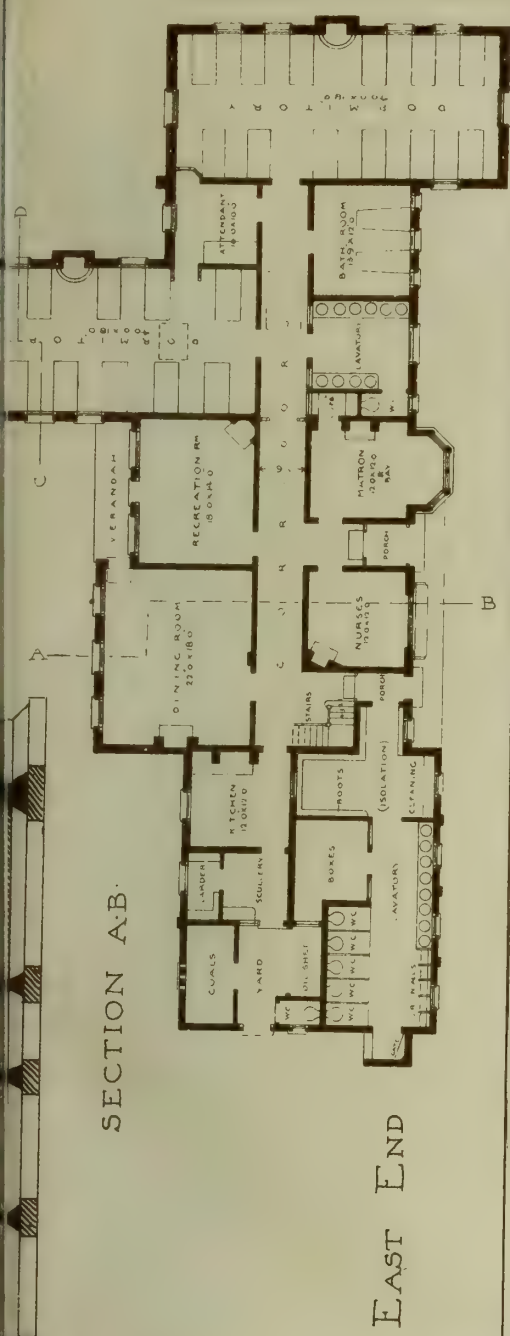
UPPER FLOOR







VIEW FROM SW.



NATIONAL SOCIETY FOR THE EMPLOYMENT OF EPILEPTICS : Passmore Edwards' Home for 24 Men CHALFONT ST PETERS, BUCKS.  
M<sup>RS</sup> MAURICE B ADAMS FRIBA ARCHITECT











VIEW FROM S.W.



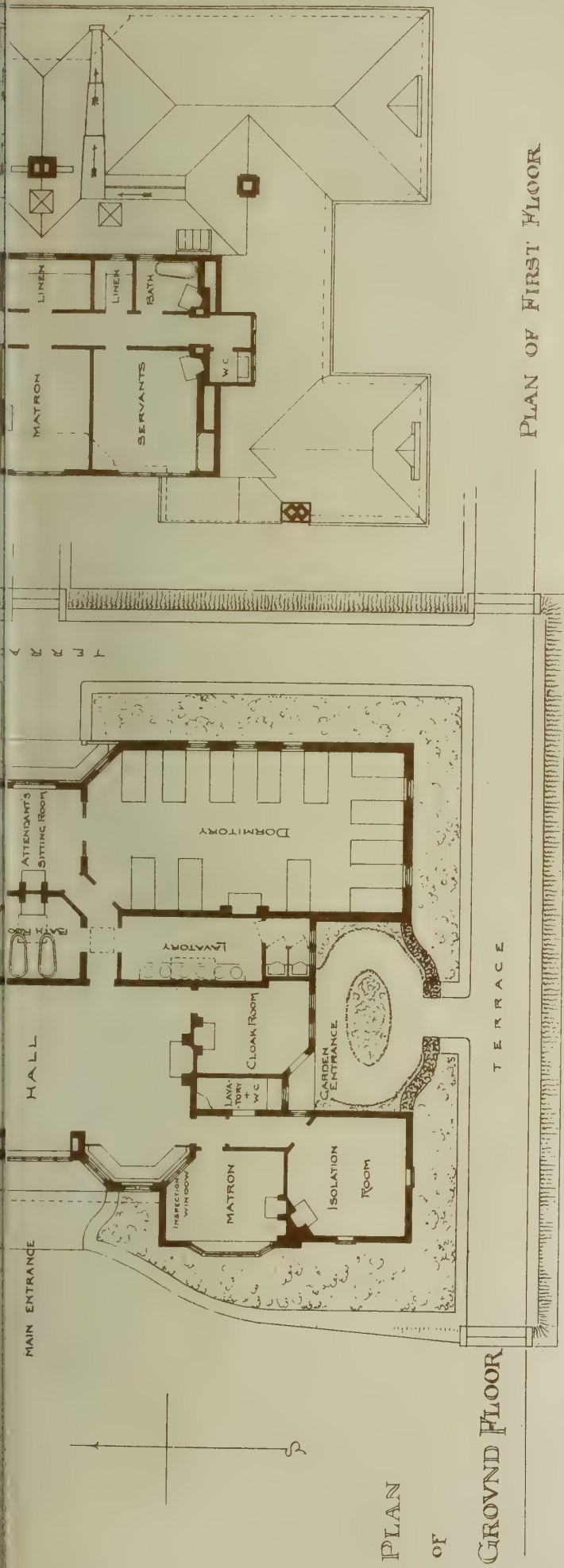
1896

# THE ELEANOR HOUSE OF THE NATIONAL SOCIETY FOR THE EMPLOYMENT OF EPILEPTICS

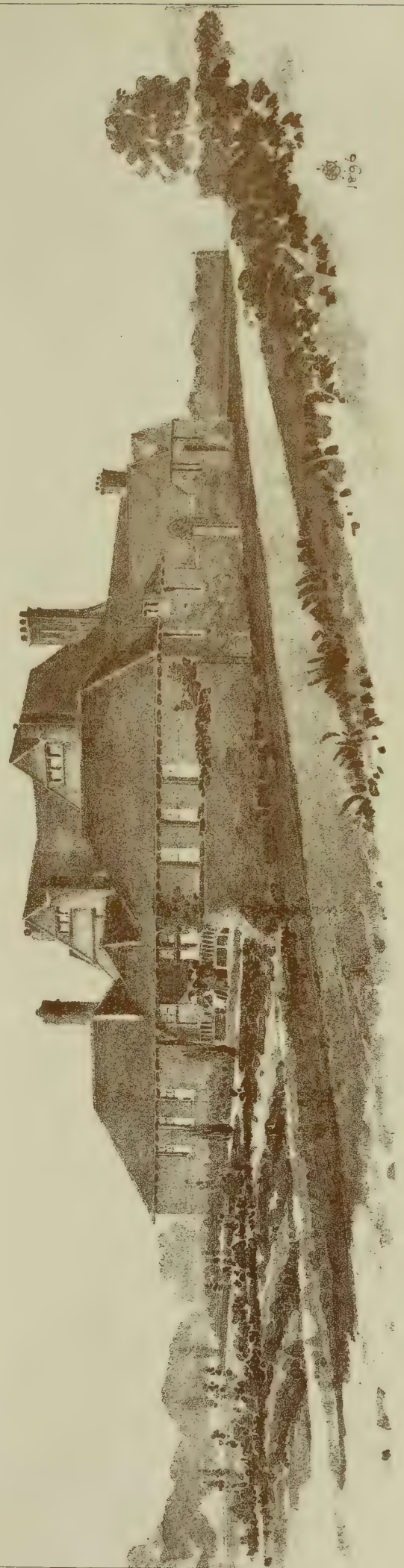
Arch. C. S. Searman  
Builder







VIEW FROM NE



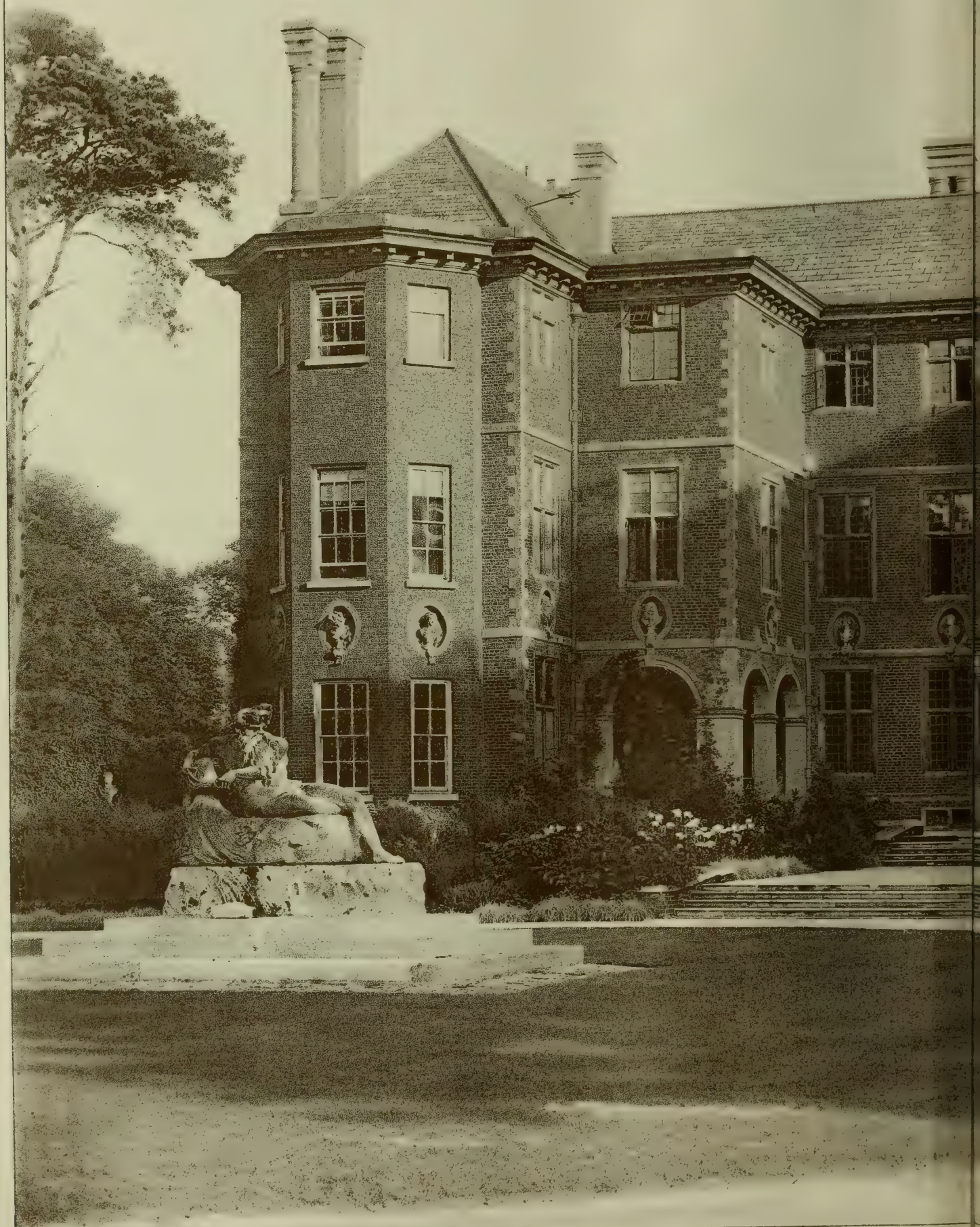












FROM "LATER RENAISSANCE ARCHITECTURE IN ENGLAND," BY JOHN BELCHER & MERVYN E. MACARTNEY.



5. MAY 7. 1897.



"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

PETERSHAM.







THE BUILDING NEWS, MAY 7, 1897.

PASSMORE EDWARDS' HOME FOR 24 EPILEPTICS (MEN) CHALFONT ST PETERS, BUCKS.

FOR THE NATIONAL SOCIETY FOR  
THE EMPLOYMENT OF EPILEPTICS

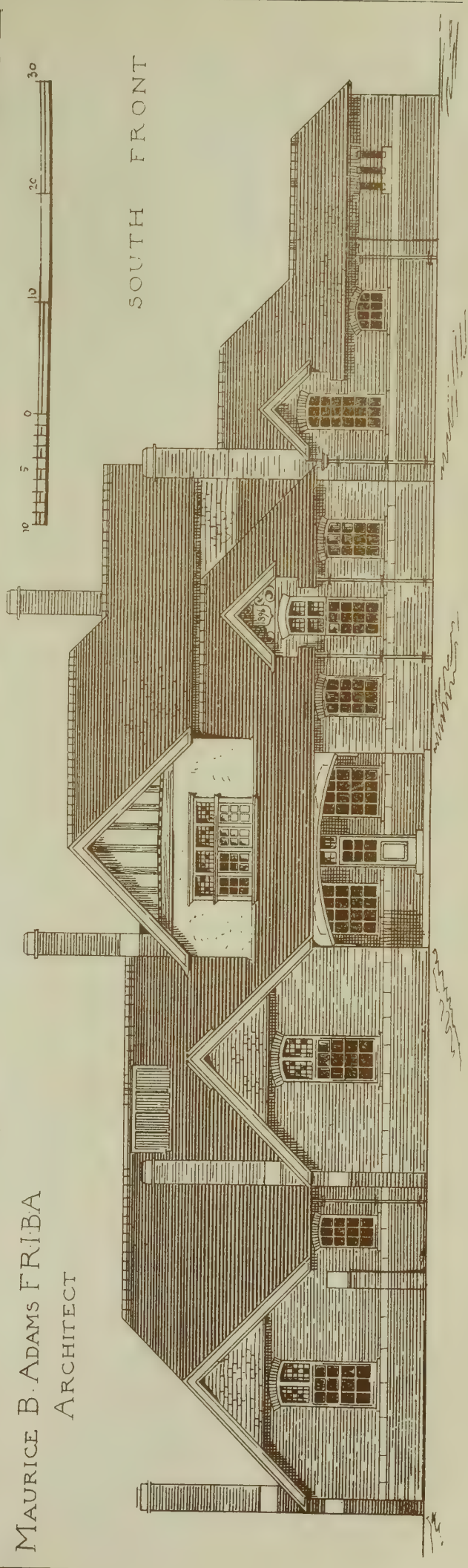
NORTH FRONT



MAURICE B. ADAMS FRIBA  
ARCHITECT



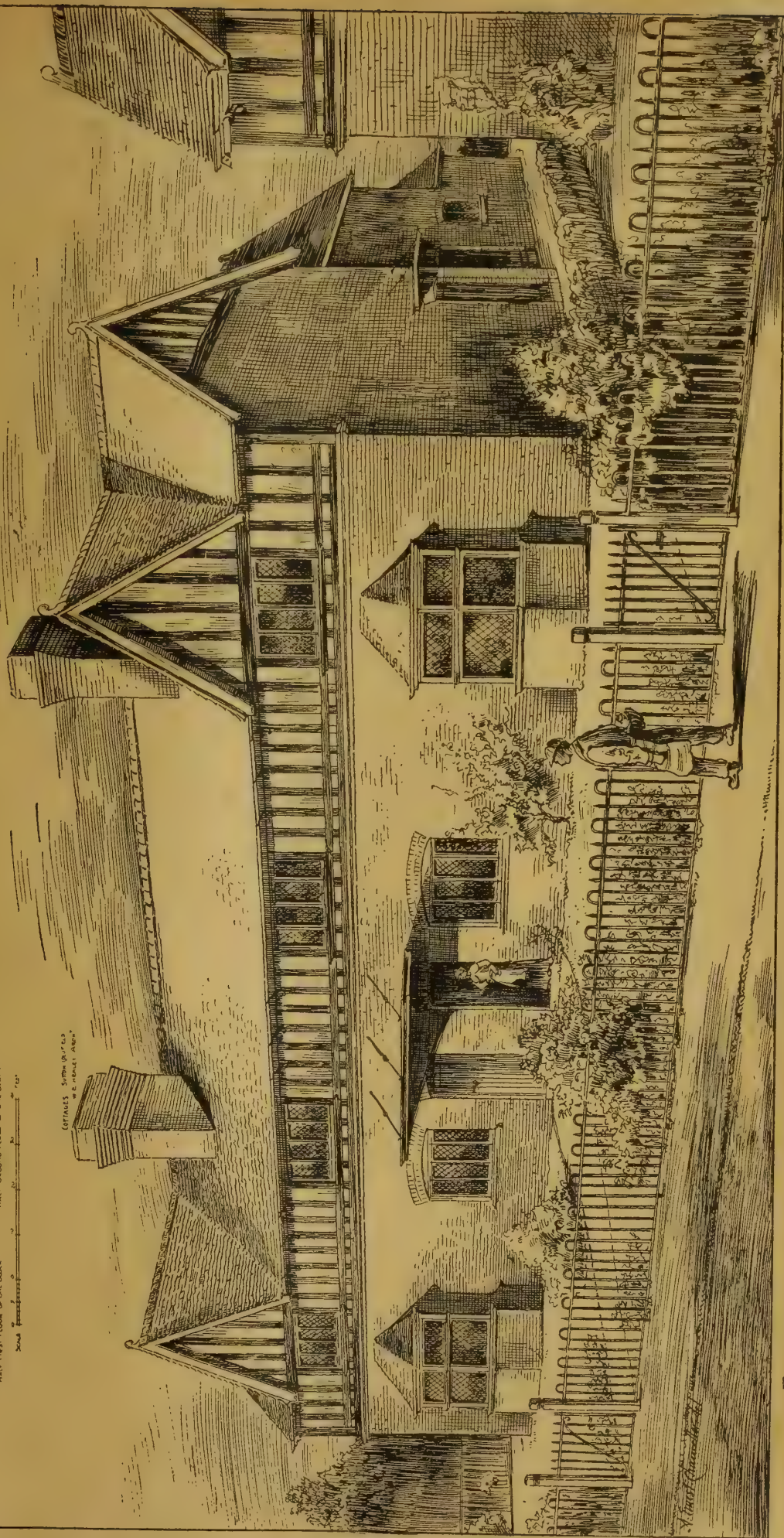
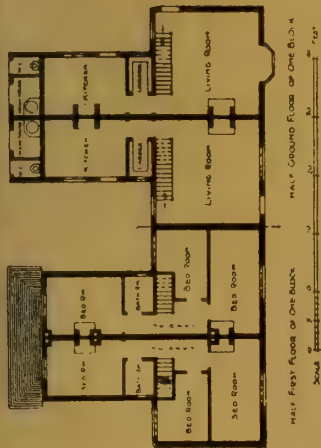
SOUTH FRONT











EIGHT COTTAGES AT SUTTON COLDFIELD · BIRMINGHAM · · WILLIAM E. HEALEY ARCHTCT ·



# ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The annual general meeting of the Liverpool Architectural Society was held at the Law Library, Union-court, on Monday evening, May 3. The annual report stated that the number of members was 121, and included 52 Fellows, 22 Associates, 29 students, and 18 honorary members. The ordinary meetings had been much better attended than in previous years. The council regretted the retirement of Mr. H. L. Beckwith from the position of hon. secretary, which he had held for a period of seven years. It was hoped by the council that they would be able to suitably celebrate the jubilee of the society during the next session, and to establish a travelling studentship to be awarded at the end of each session. The statement of accounts presented by the treasurer, Mr. James Dod, showed cash in hand £26 3s. 3d. on the general account, and £36 19s. 5d. on the library account. The following officers and council were elected for the 50th session:—President, W. E. Willink, M.A.; A.R.I.B.A.; vice-presidents, E. A. Ould, and J. Woolfall; hon. secretary, Professor Simpson; assistant hon. secretary, Arnold Thorneby, A.R.I.B.A.; hon. treasurer, James Dod; hon. librarian, J. W. Blakey, A.R.I.B.A.; council, H. L. Beckwith, G. Bradbury, T. E. Eccles, A.R.I.B.A., H. Hartley, F.R.I.B.A., H. A. Matear, F.R.I.B.A., E. A. Ould, and J. Woolfall (Fellows) and J. W. Blakey, A.R.I.B.A., and F. E. P. Edwards, A.R.I.B.A. (Associates). Mr. George Bradbury, in a short address, said that, as a mark of the jubilee year of their society, which was the oldest of the kind in the kingdom, a special effort should be made during the next session to increase their membership, and thereby increase the importance of their society, whilst endeavours should also be made to increase the usefulness of the society to its members. On the motion of Mr. W. E. Willink, a cordial vote of thanks was awarded Mr. Bradbury for the great services rendered by him to the society during the past year as president.

## CHIPS.

On Saturday, after evensong, in the choir of Truro Cathedral, the pastoral staff used by the late Archbishop while Bishop of Truro, and bequeathed by him to the Dean and Chapter of the Cathedral, which he founded, was placed in a niche prepared for it in a recess of the junction of the south choir-aisle with the "Benson transept." The staff, which has some characteristics of Celtic workmanship about it, is placed in a case of Burmese teak, lined with purple velvet, and faced with glass, designed by Mr. J. L. Pearson, R.A. A brass plate, with a short inscription, to be contributed by Mr. A. C. Benson, will shortly be placed beneath the case.

A pulpit has been erected *pro tem.* in the yard of the firm of Messrs. Harry Hems and Sons' studios at Exeter. It is destined for the new Church of St. Andrew, now building from the designs of Messrs. Tait and Harvey, architects, of Exeter, at Paignton, and is made entirely of polished Devonshire-coloured inlaid marbles and sculptured alabaster.

A memorial window has been placed in the chancel of Balby church, near Doncaster; subject, the Crucifixion, with figures of the Blessed Virgin and St. John. Also a window in the south wall, and another in the south aisle, with the figures of Our Lord as the Good Shepherd and the Light of the World. They have been executed by Mr. T. W. Camm, of the Studio, Smethwick, near Birmingham.

On Wednesday week Lord Hatherton laid the foundation-stone of the new science buildings to be erected in connection with the Grammar School, Compton-road, Wolverhampton. The buildings will include laboratories, lecture theatre, and other rooms. The cost is estimated at £2,000. The architect is Mr. G. H. Stanger, and the builder Mr. H. Willecock, both of Wolverhampton.

The foundation-stone of a new Baptist chapel was laid at Bowerchalke, Wilts, on Wednesday week, by the Countess of Pembroke. The building will be of red bricks, and adjoining an old chapel, which will be converted into schools. Mr. Isaac Day is the contractor for brickwork, Mr. Soper, of Salisbury, for the stonework, and Mr. Witt for the carpentry.

Although there was a good supply of property offered at the Mart during last week, and a total of £105,525 was achieved, yet business was not so good as it might have been, and many lots were unsold. Town and seaside houses failed to sell. The chief sale of the week was a Walthamstow building estate of 22 acres for £16,200.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or \$dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 35fr. 80c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—S. W. P.—T. D. C. and Son.—C. F. O. Co.—B. G. O. (Wisbeach).—J. J.

## Correspondence.

### R.I.B.A. ELECTIONS.

To the Editor of the BUILDING NEWS.

SIR,—There is an old saying that "Fools make feasts for wise men to eat." No doubt many of the members can afford £1 10s. as the price of a ticket for an Institute dinner, but on a recent occasion only 38 of the 1,600 members of the institute attended! But £1 10s. did not meet the necessities of the case, and the existing council added about £30 (from the funds of the Institute) that the select 38 might eat, drink, and be merry with the wise men who patronise architecture. It is to be hoped that a new council may be elected who will consider that good-fellowship and kindly association at the festive board should not be limited to those members with long purses. Under no circumstances should those who cannot afford to be present be compelled, as they have been, to contribute to the cost of the hospitality extended to non-members of the Institute. Such hospitality should be at the cost of those members who grace the banquets with their presence, and enjoy the company and compliments of their guests.—I am, &c.,

May 5. A PLUMPER FOR NEW CANDIDATES.

### SMOKY CHIMNEYS.

SIR,—As I represent no more learned profession than that of the "pen-pusher in ordinary," it is not to be expected that any profound sentiments upon such a subject as the above, can emanate from such a source. Still, though my ideas be simple, I should feel gratified if you could afford me an opportunity of a making a few

remarks upon what I consider to be an incongruity in the building trade.

To be brief, it is the "clapping on"—to very large chimneys—of very small chimney pots, an expression, which in itself seems to bespeak error, for it hardly seems logical to impede the progress of the products of combustion just at that point at which it is most desirable there should be no impediment.

I am aware that the ascending column of smoke and heated air gradually cools and contracts as it nears the highest point of the chimney, which would obviously demand some reduction in the area of the flue at that point. But is it not possible that this may be overdone and the draught in the chimney spoiled in consequence?

I am very much inclined to think myself that a good many of the refractory chimneys we hear about (which smoke at the wrong end when there is no apparent cause, such as adjacent buildings, trees, and high ground, &c.), smoke in virtue of the inefficiency or, perhaps I should say, inappropriateness, of the pot which terminates them.

And, in support of this opinion, too, I may say that several cases of smoky chimneys have occurred recently in a newly-erected building in which I am interested, and I have discovered that whilst the flues have an area of 126sq.in. each (i.e., 14ft. by 9ft.) for some wise purpose no doubt they have been crowned with very pretty pots of 7in. diameter, by means of which the orifice at the exit for the smoke is reduced to, practically, one quarter that of the flue itself!

That this is a dangerous proportion is evidenced by the fact that the chimneys in question smoke "somethink 'orrid," as has been said, and that the architect who committed the crime lives in imminent danger of a speedy annihilation is likewise a point admitting of no great doubt, inasmuch as a certain officer of the establishment aforesaid has observed with much feeling that

If he could cop the bloke as built the 'ouse  
He'd d— soon kipper 'im in it.

No, but putting all joking aside (if kipped architects is any joke), I think the appearance of chimney pots is more often considered than their use, for I have found them established upon tops of flues without apparently any reference to their size whatever.

As smoky chimneys are among the worst and most uncomfortable of constructional imperfections, I should like to ask, in conclusion, how it is that no rule is given in books upon building construction by which to determine the area of smoke flues for houses and public buildings, using only ordinary grates? At least, I have never come across one.

Apologising for the length of this communication, which I trust will not be transmitted through the editorial flue—I am, &c., Pot.

### ST. GEORGE'S CHURCH, STOCKPORT.

SIR,—Many readers of the BUILDING NEWS will desire to thank you for publishing so admirable a set of drawings as those of the above church. All, however, will agree with your remark regretting the absence of a plan, and I write, no doubt echoing the sentiments of many architectural students, to ask if it is not possible for you to publish a plan to scale of this magnificent edifice in an early issue. This would be of real value, and suitably complete the illustrated description of the church.

No doubt Messrs. Austin and Paley would gladly render any assistance if approached in the matter.—I am, &c. EDGAR H. WOODCOCK.  
83, Wellington-st., Alexandra Pk., Manchester.

[Although we did our best to obtain a plan, we hope our correspondent's suggestion may be realised. He only represents the wish of many others.—Ed. "B.N."]

There was a record number of applications for linings at Glasgow Dean of Guild Court on Friday—seventy-nine.

Major-General R. D. Crozier, R.E., Local Government Board inspector, held an inquiry at the council chamber, Egremont, on Friday, into the application of the Wallasey District Council for sanction to borrow £30,000 for works of sewerage and £14,000 for gasworks purposes. With regard to the latter item, the sum of £2,000 was included for gas cookers, which it was proposed to hire or sell to consumers, and also for automatic or penny-in-the-slot meters.



## Intercommunication.

### QUESTIONS.

[11657].—**Architects' Commission for Asylum Work.**—What is the scale of architects' fees adopted in England for work to lunatic asylums?—AN IRISH ARCHITECT.

[11659].—**Valuation.**—Can any fellow reader oblige me by recommending names of books for study and reference on ordinary valuation for assessment of poor law guardians, both elementary and advanced, with examples of work?—STUDENT.

[11659].—**Country Church.**—Will any reader kindly inform me as to what will be the approximate cost of a plainly-built church, constructed of local stone, in a country district? The church to accommodate 300 people, but the cost of seats is not to be included in the approximate estimate. Also what will be the probable dimensions of the building?—CLERIC.

[11680].—**Vats.**—Will anyone accustomed to make vats, coolers, and tuns for brewhouses, kindly inform me the best kind of wood, and the best mixture to joint the same, as I have been given to understand white wood is less tasteless to the beer than any other kind of wood; also white-lead the mixture to joint with? If anyone that has had experience will kindly inform me if that is so, he will oblige.—A THIRTY YEARS' SUBSCRIBER.

### CHIPS.

At the Liverpool Bankruptcy Court, on Friday, James Crosbie, described as a journeyman joiner, formerly a master joiner and builder, carrying on business in Chatham-street, Liverpool, who failed towards the end of 1895, now applied for his discharge. The original liabilities were returned at £3,947, and the assets realised £283. The trustees had been able to pay a first and final dividend of 1s. in the £. His Honour, Judge Collins, suspended the bankrupt's discharge until he shall have paid 10s. in the £.

The Board of Trade have intimated to the solicitors acting for the promoters of the new Victoria Pier to be erected opposite Riviere's Concert Hall, Llandudno, that the provisional order will be granted at once. It is expected that the first pile will be driven early in the autumn.

The Vice-Chancellor of Ireland has given judgment in the Giant's Causeway right of way dispute. He held that the defendants had failed to establish their contention that there was a public right of way to and from the Causeway, or to establish a customary right of access to and use of the Causeway for the purpose of recreation. He gave judgment, therefore, for the plaintiffs, with costs.

The Archbishop of Canterbury opened on Friday the new library at Hereford Cathedral. The building occupies the exact site of the Medieval Library, in the Bishop's Cloisters, in existence from 1480 to 1590, and has been erected with a legacy of £4,000 left by Canon Powell. Sir A. W. Blomfield, A.R.A., was the architect.

The Duke and Duchess of Portland had a busy time at Troon on Friday. They opened the new waterworks, constructed from plans by Mr. W. R. Coupland, performed the opening ceremony of a new green for the Portland Bowling Club, laid the foundation-stone of a clubhouse for the Troon Ladies' Golf Club, and were present at the formal opening of a new hotel erected on the Marine Parade.

The members of the photographic section of the Ipswich Scientific Society are proposing to make a systematic photographic survey of Ipswich and the neighbourhood, securing records of streets, courts, and buildings, wood-carving, &c., and any object possessing antiquarian, architectural, or historical interest. Members having negatives of portions of Ipswich which have already disappeared are requested to lend the same for reproduction. In this way it is proposed to make two albums for the collection; one to be the property of the society, and the other of the town museum.

Two large stained-glass windows have been placed in the sanctuary of the Roman Catholic Cathedral of Edinburgh, one to the memory of Archbishop Smith, and the other to the memory of his brother, Archibald D. Smith Sligo, of Inzievar. The window in honour of the Archbishop is dedicated to the Sacred Heart, which occupies the centre light. The light at the right is filled with a figure of St. Giles, and the left with that of St. William; the arms of the archbishop are placed beneath. The memorial to Mr. Smith Sligo has in the centre the figure of St. Joseph, and on each side the figure of St. Marguerite (to the honour of his wife, Lady Harris), and the figure of St. Vincent de Paul. Another window has been placed at the altar of St. Andrew, to the memory of the late Mr. Henderson.

The Bath Corporation were informed at their last meeting that the new Monkswood reservoir was practically completed on April 29. The work has been carried out for the water-supply committee by Messrs. Neave and Son, contractors, Mr. White being the clerk of works.

### PARLIAMENTARY NOTES.

**THE WALLACE BEQUEST.**—Dr. Farquharson asked the First Lord of the Treasury on Monday whether he was now able to state to the House the probable arrangements for the housing of the Wallace Bequest; whether there was anything in the terms of the will preventing the art treasures in Hertford House being allowed to remain there permanently; and whether, in the event of the Government deciding to remove them to Trafalgar-square, consideration would be given to the urgent need for extension of the National Gallery buildings, so as to secure the proper display of the pictures which they contained. Mr. Balfour: A committee has been appointed to inquire and report into the whole circumstances connected with the Wallace Bequest. The terms of the reference to the Committee are as follows: "Where, in what manner, and at what probable cost, provision may be best made for housing and exhibiting the art collection recently bequeathed to the nation by Lady Wallace, and to make any recommendations which may seem fit to them as to the constitution of a trust in which this collection may be vested." The members of the Committee are Lord Lansdowne (chairman), Sir William Harcourt, Sir Edward Poynter, Mr. Freeman Mitford, Mr. F. Mowat, Mr. Walter Armstrong (Director of the National Gallery of Ireland), Mr. Alfred Rothschild, and Mr. Alfred Waterhouse. Dr. Farquharson asked whether the collection would be open to the public during the time it remained at Hertford House. Mr. Balfour: I should think it would be impossible to open the collection until arrangements have been made for its public exhibition.

**PLUMBERS' REGISTRATION BILL.**—On Friday night, Mr. Lees Knowles secured, by a stroke of good fortune, the second reading of a Bill for the Registration of Plumbers, at which he has been hammering away since 1891, and has several times missed passing only by the sheerest bad luck. What is more, it was sent to the Standing Committee on Trade.

### WATER SUPPLY AND SANITARY MATTERS.

**CASTLE EDEN COLLIERY.**—At a meeting of the Easington Rural District Council, a scheme for the supply of water for Castle Eden was submitted by the engineer, Mr. D. Balfour, M.Inst.C.E., of Newcastle and Edinburgh. The work consists in pumping water from a duplicate well or staple at the colliery to service tanks situate near Dean Leazes Farm at sufficient altitude to give an excellent pressure, and from thence the water will be distributed in cast-iron mains for supplying the inhabitants. The scheme was adopted, subject to a satisfactory arrangement being come to with the owner of the staple.

**FOLESHILL.**—The Folehill Rural District Council, at their meeting on the 28th ult., decided to adopt the scheme of sewerage and sewage disposal for the parish of Folehill, prepared by Mr. H. Bertram Nichols, C.E., of Birmingham. The estimated cost of the scheme for the engineering work is £24,019.

**THE PROPOSED DRAINAGE BY-LAWS FOR THE METROPOLIS.**—At a meeting of the Sanitary Inspectors' Association, held on Saturday at Carpenters' hall, London Wall, a paper was read by Mr. W. H. Grigg (vice-chairman) on "The Proposed Drainage By-laws for the Metropolis." Mr. W. W. West (chairman of council) occupied the chair. Mr. Grigg said that the necessity for a complete code of drainage by-laws for the Metropolis was obvious to everyone, and it was difficult to understand why it had not long ago forced itself on the authorities as a matter of extreme urgency, particularly when London's central authority had had the power to make by-laws since 1855, and had now prepared them under that Act. He pointed out several respects in which he considered the by-laws required to be amended. There was no provision made for the submission of plans, sections, and elevations of the proposed works to the local authority to be approved before commencing the works; the fall of drains was not specified; drains were not required to be true in invert and clear in bore; inspection chambers were not made compulsory; there was no penalty for covering up work before it was approved by officers of the local authority; the supplying of water and filling-in of drains by the builder was not provided for; and the construction and maintenance of urinals was left out entirely. When sanitary inspectors served notices requiring certain specified works to be performed, unsympathetic owners frequently retorted, "Well, if I do all this work now, what guarantee have I that in a year's time you will not come again and condemn it all owing to some new fad, and require something else?" And when it was borne in mind that it was only on June 28, 1893, that the by-laws under the Public Health (London) Act, 1891, were issued, which differed materially from those now proposed by the London County Council, it was not surprising that such complaints should be made. Continuity in

methods and requirements was a most desirable thing in this matter, and unless there was some absolute proof that the existing requirements were inadequate, it was earnestly to be hoped that the change would not be insisted on. There was nothing to show whether these by-laws were to supersede those under the Public Health (London) Act, 1891, or if they were both to exist side by side. Many necessary things were provided for in the latter which were omitted from the new ones, and if they were to remain in force, in matters dealt with by both, they must be made to agree. That the new by-laws had in them the elements of a great change there could be no doubt; but if they were not made to apply to repairs, &c., in old houses, a great work yet remained to be done.

**WEST BROMWICH.**—The borough surveyor, Mr. Greatorex, has prepared a special report for the sewerage committee of the West Bromwich Town Council on the treatment of sewage at Friar Park. He submits for their consideration two schemes, the first being chemical precipitation in land and artificial filtration, and the second bacteriological treatment. He describes in detail both processes, and also gives estimates of the cost. The total estimated cost of chemical scheme No. 1 is £16,790, chemical scheme No. 2 £18,745, and the bacteriological scheme £16,905. The approximate estimate of annual expenses is: chemical scheme No. 1, £2,557 12s. 6d.; chemical scheme No. 2, £3,064 7s. 6d.; and bacteriological scheme, £945 5s. He also recommends the erection of a farm bailiff's residence and farm buildings, at an estimated cost of £2,000; also six cottages for the workmen employed on the works, at a cost of £1,200, which could be let at a rental of 4s. per week each. He suggests that the committee should ask Mr. Dibdin (late chemist to the London County Council) for his opinion as to the proper chemical or bacteriological treatment of the sewage, and also recommends that a sub-committee should visit various towns where the systems referred to are in operation.

Mr. Bicknell, M.I.C.E., has held a Local Government Board inquiry at Shoeburyness into applications by the urban district council for sanction to borrow £1,450 for purposes of the water supply, and £825 for works of private street improvements.

In the application made on behalf of William Harris Bromley, of Corsham, Wilts, builder, the order of discharge from bankruptcy has been suspended for two years and a half ending Sept. 19, 1899. In that of Walter Clarke, of Sheffield, builder, the discharge has been granted conditionally.

The eleventh annual report of the Holloway Sanatorium at St. Anne's Heath, Virginia Water, contains a recommendation by the committee of a further addition of £3,000 to the reserve fund, and an expenditure of £15,000 on the purchase of land and structural additions, which, when completed, would make the sanatorium, as regards convenience and comfort, unique as a hospital for the insane.

The remains of the late Mr. J. B. Napier, art master, were interred on Friday in Morningside Cemetery, Edinburgh. Mr. Napier went to Edinburgh at the age of 16, and studied at the Royal Scottish Academy's school. On the completion of his studies, he practised his profession in the city and neighbourhood, having taught in such institutions as Loretto School, Moray House, and Heriot's Hospital. For many years he exhibited regularly at the Royal Scottish Academy. He was 69 years of age.

The dissolution of partnership is announced in the case of G. E. Nield and F. J. Rogers, architects and surveyors, Monument Station Buildings, E.C.; and also in the case of W. S. Horner, H. W. Horner, E. S. Horner, and L. Horner, builders and contractors, of Aldgate, E.C., and Love-lane, Shadwell, E., under the style of Ashby and Horner, so far as regards W. S. Horner.

Two spacious dwelling-houses in Mount-pleasant, Liverpool, having been acquired by the administrators of the Convent of Notre Dame, are about to be pulled down. There is to be raised on the vacated site a building of classrooms, and externally in keeping with the present architectural features of the convent, the design being by Mr. Edmund Kirby, F.R.I.B.A., of Liverpool.

In response to an invitation from the Ipswich Dock Commissioners, the chairman and principal officials of the Great Eastern Railway Company have visited Ipswich to consider the question of providing greater facilities in the river accommodation for the development of the trade of the port. A private consultation was subsequently held at the town hall with the representatives of the Dock Commission Committee of Management. The chief points considered were the construction of an outlet for goods traffic from the extreme end of the dock, and the provision of deep-water berths for large vessels at the suburb of Halifax, on the south bank of the Orwell below the town.



## Our Office Table.

At the Royal Institution, Albemarle-street, on Saturday, the Rev. Dr. J. P. Mahaffy, Professor of Ancient History in the University of Dublin, delivered the first of three lectures on "The Greek Theatre according to Recent Discoveries." The theatres at Pompeii were by far the earliest excavated, but we had no certainty that these theatres were not Roman. It was not till 1862 that by the efforts of the German, Strack, the site of the theatre of Dionysus at Athens was cleared, and we found out what this famous structure was in the last stage of its development. Its curved rows of seats, the orchestra or flat centre, with its tessellated ornament, and the marble row of stalls around it, with the names of the official occupants, were unmistakable. There was something piquant in seeing the monumental evidence of the close connection of play-acting and religion; to see that what we might call the deans, canons, and prebendaries at Athens had their stalls, not in the choir of a church or temple, but in the front of a play-house. The discoveries of other Greek theatres were alluded to, and their ruins described. It was with these discoveries, he proceeded, that the comparative study of Greek theatres became possible, and it was to architects that we owed all our greatest discoveries in connection with them. There was good reason to believe that the Greeks, so great in sculpture and in architecture, were not great in music or in painting, and if nothing had been preserved in classical times but the music of the Greeks, it would have been difficult to suspect their greatness in other fields.

THE half-yearly meeting of the Scottish Building Trades Federation was held in Dundee on Friday.—Mr. John Adams, president in the chair. Representatives were present from all parts of the country. The secretary (Mr. J. L. Selkirk, C.A., Glasgow) submitted the report of the Executive on the work of the past six months, which bore that a number of additional local associations had been organised, and that others were in progress. The movement had been hailed by employers as an important step in the direction of securing various urgent improvements in matters of vital interest to the building trades, and which could only be satisfactorily accomplished by a thorough combination on the part of those immediately concerned. The meeting had under consideration a draft form of contract, which had been fully discussed, and remitted to the Executive. The question of a suitable general mode of measuring, as well as of working by-laws also engaged attention. Arrangements were made for stated reports on the condition of trade throughout the country being received and tabulated for circulation among all the local associations. Satisfaction was expressed at the prospect of building trade questions being now taken up in a manner fitted to result in practical benefit to all concerned.

THE wardmote at Walbrook for the election of a successor to Alderman Sir James Clarke Lawrence, Bart., who has accepted the aldermanry of Bridge Without, has been fixed for Monday next. Mr. Samuel Green has come forward for the office, and will in all probability be returned unanimously. Mr. Green was for some years a Common Councillor for Farringdon Without. From this position he retired in consequence of his professional retainers in the Holborn Valley improvement scheme interfering with his position as a member of the Corporation. Mr. Green is the senior member of the firm of Green and Son, surveyors, auctioneers, and land-agents, of 28 and 29, St. Swithin's-lane; a Fellow of the Surveyors' Institution, one of the surveyors to the Board of Trade, one of the valuers appointed by the Common Council under the Finance Act of 1894, a member of the committee of the Estate Exchange, and the surveyor to the parish of St. Swithin, London Stone.

The foundation-stones of new Wesleyan day and Sunday schools and lecture-hall were laid at Garston, near Liverpool, on Friday. The schools and lecture-hall are being built adjacent to Island-road Wesleyan church by Messrs. Turner and Moss, Garston, from plans by Mr. Rhind, architect, Liverpool, and the cost is estimated at £3,100. They afford accommodation for 339 scholars, and in addition there will be a lecture-hall, ladies' parlour, and library.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. Discussion on "Legal Incidence of Tenancies of Urban Property." 8 p.m.  
Society of Arts. "Design in Lettering." Cantor Lecture No. 2, by Lewis F. Day. 8 p.m.  
WEDNESDAY.—Society of Arts. "Motor Traffic: Technical Considerations," by Sir David Salomons, Bart. 8 p.m.  
Edinburgh Architectural Association. Annual Business Meeting and President's Valedictory Address. 8 p.m.  
Carpenters' Hall, London Wall, E.C. "Shoring," by Thomas Blashill, F.R.I.B.A. 8 p.m.

## CHIPS.

A new music-hall is about to be built in Carlton-grove, Brixton, at an estimated cost of £18,000, from plans by Messrs. Wilson and Long. It will be seated for nearly 3,000 people.

Grove Hall, Wanstead, was opened last week. It has been built from plans by Mr. E. N. Whitaker, and seats 500 people. Mr. J. Joliffe was the builder. The cost has been over £2,500.

The Local Government Board has sanctioned a loan of £27,500, for 40 years, to the Hornsey District Council for the purpose of erecting 108 dwellings for the working classes and the purchase of 4½ acres of freehold land for the site. Six-roomed houses are to be built, for which 7s. 6d. a week will be charged.

The Duchess of Albany will open the new Convalescent Home at East Finchley of the National Hospital for the Paralyzed and Epileptic on Wednesday, June 16.

At Knebworth parish church, Herts, two new treble bells, completing the octave in the tower, were dedicated last week. They have been cast by Messrs. John Warner and Co., of London.

The bells in the parish church of Stradbroke, Suffolk, have just been rehung by Messrs. H. Bowell and Son, of Ipswich.

A movement is on foot for providing a public park for Ilford. A provisional agreement has been entered into with Mr. Holcombe Ingleby for the purchase of about 29 acres of land, a portion of Valentine's estate, including a lake about seven acres in extent. The price agreed upon is £320 per acre, and the amount is being raised by subscriptions.

The new athletic ground and pavilion at Myreside, Edinburgh, for George Watson's Athletic Club were formally opened on Saturday. The club accommodation on the ground floor of the pavilion consists of an entrance vestibule and two dressing-rooms, each 25ft. by 16ft., with lavatories and spray-rooms, &c. Behind these there is a work-room and two other dressing-rooms. A stone staircase leads to the upper floor, where the roof space over the front building is utilised to form a hall about 60ft. by 17ft. 6in. The walls are constructed of hollow brick with cement harling, the window margins, &c., being of pressed face brick. The upper part of the back building is treated with half-timber work, and the roofs are covered with red tiles. The field is valued at £13,000. It has cost £2,000 to level the ground, and the pavilion has cost £2,700.

The marriage of Mr. T. F. Bunting, borough surveyor of Maidstone, to Miss Trendall, of that town, was solemnised on Thursday in last week at St. Faith's Church, Maidstone. The vicar officiated, the service being choral.

New Sunday-schools attached to Trinity Wesleyan Chapel, Penarth were opened on Wednesday week. The main hall of the new building will seat 500 people, and there are also an infants' school, holding 150 children, 14 class-rooms, a library, and a church parlour, seated for 100. The building is heated throughout by a low-pressure hot-water system supplied by Messrs. John Williams and Sons, Cardiff, and the lighting by means of gas, also by the same firm. The contractor is Mr. John Jones, Penarth, the architects being Messrs. J. P. Jones, Richards, and Budgen, St. Mary-street, Cardiff. The total cost of erection has been £2,600.

A portrait of the late W. J. Bishop, a noted artist, who was at one time president of the Liverpool Academy of Arts, has been presented to the Corporation of that city. Mr. W. B. Boadle is the painter.

A new departure in the construction of hospital wards is, says a daily journal, in progress at the Temperance Hospital in the Hampstead-road. This is nothing either more or less than a ward made of glass. The glass used is of an opaque white colour, resembling porcelain with a high sheen. It is fixed in the shape of rectangular tiles about ½ in. thick on a background of cement, and is pointed as bricks are when finished. The idea is that the surface offers the least possible hold for the development and growth of microbes, and by turning on a hose they can be thoroughly cleansed with no trouble.

The memorial to Mr. Charles Bradlaugh in Brookwood Cemetery has now been completed by the erection of an ornamental iron railing round the grave and the planting of shrubs. The inscription on the polished granite plinth bearing the bronze bust of Mr. Bradlaugh is as follows:—"1833. 'Thorough.' 1891. Charles Bradlaugh; born September 26th, 1833; died January 30th, 1891. *Semper nobilis.*"

The death is announced of Mr. J. Andreas, architect, of 69, Upper TOLLINGTON PARK, N. He had been a member of the Architectural Association since 1886.

The career of the late Alderman William Lawrence, father of Sir William, who died last week, was, says the *Western Mercury*, watched with exceeding interest by Cornish people of all classes. Alderman Lawrence was a working carpenter in a very small way at St. Agnes when he started for London, just about a hundred years ago, with two guineas in his pocket and a bag of tools upon his back. His subsequent career as a builder and contractor is well known, and throughout his life he paid regular visits to St. Agnes, and was a generous contributor to all local charities, as also were the late Sir William and his brother. Miss Lawrence, who acted as Lady Mayoress during Sir William's term of office, has only survived her brother a fortnight; she died on Sunday last, aged 74 years.

Mr. F. H. Tulloch, M.Inst.C.E., Local Government Board inspector, held an inquiry at the district council offices, Eastleigh, Hants, on Thursday evening in last week, with respect to applications to borrow £1,533 for works of private street improvement, and £850 for sewerage and sewage disposal.

A syndicate has been formed with substantial financial backing in London to obtain a concession for the erection of blocks of dwelling-houses in Bombay for the labouring classes. A municipal guarantee for 3½ per cent. forms part of the scheme.

The directors and committee of the Liberal Club at Norden, near Rochdale, have accepted the plans of Mr. Duncan, of the firm of Duncan and Butterworth, for the new club.

The general purposes committee of the Barrow town council have decided to recommend to the next meeting of the council the purchase of tramways, including the depot, but exclusive of rolling stock, for the sum of £17,000. The lines extend to about seven miles, and at present are worked by steam.

A new Welsh Congregational Chapel in Henrietta-street, Swansea, was opened last week. Mr. Williams was the architect, and Mr. H. Billings, also of Swansea, the contractor for the chapel, which has cost £2,500, and seat 500 people.

The Duke of Cambridge presided on Monday at the opening of a Centenary Hall and other new buildings which have been added to the Jews' Hospital and Orphan Asylum at West Norwood. The Centenary Hall is in the domestic Gothic style, and it has a large window above the organ, the gift of Messrs. Joseph and Smithem, the architects. The Elizabethan front has been much enhanced by the addition to the main building of a new story, with dormer windows.

At a large demonstration of Welsh quarrymen, held on Monday at Carnarvon, a resolution was passed agreeing to accept the services either of Mr. Balfour, Mr. Asquith, Mr. Chamberlain, or Lord Rosebery, as mediator in the dispute between Lord Penrhyn and his workmen.

A large meeting of actors was held on Friday at the Criterion to consider an offer from Mr. Passmore Edwards to build an orphanage upon certain conditions. Miss Ellen Terry and other leading members of the profession approved the proposal; others thought the conditions could not be fulfilled. Mr. Wyndham, who presided, gave the outline of a scheme for consolidating the various funds belonging to actors, and adding thereto a compulsory income-tax to be levied upon the members of each company by the manager. The meeting adjourned *sine die*, to enable the committee to consider the various suggestions submitted.

The Chantry Bequest Trustees have purchased, for which they paid £525, Miss Lucy Kemp-Welch's large picture, "Colt Hunting in the New Forest," from the current Academy Exhibition; Mr. Napier Hemy's "Pilchards," for £1,250; and Mr. David Farquharson's "In a Fog." In the sculpture gallery at the Academy, the choice of the R.A.'s has fallen on Mr. Pomeroy's marble statuette, "The Nymph of Loch Awe."

The village of Gordon, Berwickshire, has had introduced, under the county council administration, a new water supply. It is brought a distance of three and a half miles, from springs granted free by the Earl of Haddington, under plans by Messrs. Thomson and Wright, C.E., Edinburgh, and at a cost of about £1,000. The water was publicly turned on on Saturday.



## LIST OF COMPETITIONS OPEN.

Tonbridge—Technical Institute and Free Library (£4,000 limit)	30gs., 20gs., 10gs.	A. H. Neve, jun., Clerk U.D.C., 83, High-street, Tonbridge	May 15
Morecambe—Hotel Metropole	£100 (merged), £50, £25, and £15	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	June 16
Elne, France—Water Supply Scheme (3,300 inhabitants)	50gs., 30gs., 20gs.	La Marie, Elne, Pyrénées Orientales	July 1
Bootle—Technical School, Balliol-road (£15,000 limit)	£100, £50, £25	J. A. Crowther, Borough Engineer, Bootle	" 31
Carlton, Victoria—Children's Hospital	50gs. (merged in 5 p.c.), 20gs., 10gs.	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	No premium offered	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	—
Chesterfield—Brewery-street Board School (360 places)	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield	—
Bexhill-on-Sea—Drinking-fountain and Dog-trough (£200 limit)	£10, £5	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill	—
Burnley—Fountain, Queen's Park (£500 limit)	£25, £10	G. H. Pickles, Borough Surveyor, Burnley	—
Bury, Lancs—Art Gallery and Free Library		The Town Clerk, Bury, Lancs	—
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit)		Borough Surveyor, Salter Gate, Chesterfield	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Lancaster—School, Bowerham-lane	School Board	H. D. Wilson, Clerk, 85, Church-street, Lancaster	May 8
Elgin—Houses and Shops, High-street	Jas. Scott	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	" 8
Keld—Schools	School Board	Rev. W. Crombie, Keld	" 8
Edinburgh—Additions, South Morningside School	Jas. Scott	J. Arnot, Clerk, Castle-terrace, Edinburgh	" 8
Elgin—Shops and Houses, High-street	Presbyterian Church Committee	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	" 8
Drumquinn—Platform-Pulpit		Rev. D. Marshall, Drumquinn, Ireland	" 8
Dolphinholme—Rebuilding St. Mark's Church		Austin and Paley, Architects, Lancaster	" 8
Tenlyepatrik—Manse		S. P. Close, Architect, 55, Waring-street, Belfast	" 8
Blackhorn—Workhouse Laundry	Board of Guardians	R. C. Radcliffe, Clerk, Cardwell-place, Blackburn	" 8
Tomatin, N.B.—Distillery	Cheshire County Council	A. Mackenzie, Architect, Kingussie, N.B.	" 8
Oakmere—Additions, Police Station	Board of Guardians	H. Beswick, Co. Architect, 17, Newgate-street, Chester	" 8
Omagh—Labourers' Cottages	Board of Guardians	Wm. Cathcart, Workhouse, Omagh	" 8
Londonderry—Cottages	Board of Guardians	W. L. Parry, Poor Law Offices, Londonderry	" 8
Iltingworth—Detached House, Raw-lane	Board of Guardians	Medley Hall, Architect, 29, Northgate-street, Halifax	" 8
Ballynoe, near Fermoy—Dispensary	Board of Guardians	P. O'Neill, Clerk, Fermoy Workhouse	" 8
Cottingham—Six Houses	Dr. Hutchinson	The Owner, South-street, Cockermouth	" 8
Cockermouth—Additions to Challoner House	John Dinan	W. H. Hill and Son, 28, South Mall, Cork	" 8
Cork—Twenty-nine Houses, College-road	Potteries Stipendiary Commissioners	Edwin Penn, Architect, Stoke-on-Trent	" 8
Burslem—Offices, Moorland-road	School Board	A. Basil Cottam, A.R.I.B.A., Eastover, Bridgewater	" 8
Bridgewater—Additions, Albert-street Schools	London County Council	R. W. Partridge, Clerk to Asylums Comtee., 21, Whitehall-pl., S.W.	" 10
Hanwell Asylum—Temporary Iron Buildings	Central London Sick Asylum Board	E. W. Bailey, Clerk, Cleveland-street, W.	" 10
Hendon—Sick Asylum	J. J. Wagstaff	R. and R. E. Horsfall, Architects, 15, George-street, Halifax	" 10
Halifax—House and Shop, Clog-yard	Polkinghorne and Co.	Thompson & Greenhalgh, Architects, Bank Chambers, Southend-on-Sea	" 10
Westcliff-on-Sea—Superstructure, Queen's Hotel	Corporation	G. Adam and Son, Engineers, Bristol	" 10
Plymouth—Brewery	Ashman and Co.	J. H. Ellis, Town Clerk, Plymouth	" 10
Plymouth—Covered Market	C. H. Elgar	Jas. Hart, Architect, Corn-street, Bristol	" 10
Bristol—Enlargement Premises, Broadmead	D. Denton	Rev. T. P. John, 25, Regent-street, Barry Dock	" 10
Barry Dock—English Baptist Chapel, Holton-road	Joseph Bush	D. Petch, Architect, Huntress-road, Scarborough	" 10
Scarborough—Warehouses, Cross-street	R. Wade	W. H. Fernley, Architect, Station-lane, Featherstone	" 10
Streethouse, Yorks—Four Houses and Shop	Langyndier School Board	W. H. Fernley, Architect, Station-lane, Featherstone	" 10
Purston, Yorks—Two Houses	Urban District Council	K. Moore, Architect, 7, Albert-road, Middlesbrough	" 10
North Ormesby—Additions, Elm Tree House	Concert Hall Co.	James and Morgan, Architects, Charles-street, Cardiff	" 10
Lechryd—School	Commissioners	E. Kenworthy, Surveyor, U.D.C., Handsworth	" 10
Handsworth—Two Cottages, Sanitary Depot	Rev. W. Brown, Rector	J. F. McMullen, M.S.A., 30, South Mall, Cork	" 10
Cork—Rebuilding Bakery, St. Patrick's Quay	Urban District Council	R. M. McDowall, Architect, Castleford	" 10
Castleford—Public Hall, Jessop-road		F. M. Pollock, Town Clerk, Bangor	" 10
Bangor, Co. Down—Coal Stores, Gasworks		H. Crawshaw, Architect, 13, Regent-street, Barnsley	" 10
Barnsley—Shops, May Day-green		Alan B. Stokes, Architect, 16, Chichester-street, Belfast	" 10
Ardylass—Church Repairs		Burles and Harris, Architects, Southend	" 11
Shoeburyness—Waterworks Engineer's House		W. H. D. Horsfall, Architect, Halifax	" 11
Scammonden—Stabling for 20 Horses		Fairbank and Wall, Architects, Craven Bank Chambers, Bridgend	" 11
Baldon—House and Stabling, Langley-lane		The Master, Billericay Workhouse, Essex	" 11
Billericay—Alterations, Workhouse Floors		H. Bythway, Clerk, Pontypool	" 11
Pontypool—New Schools, Park-terrace		Director of Works, Admiralty Office, Whitehall	" 11
Hartlepool—Conversion of Barracks into Coastguard Station		R. Harpur, High-street, Dowlaish	" 11
Penyern, Down—Thirty-five Cottages		J. W. Nash, Architect, Rochester	" 11
Rochester—Alterations, Public Baths		Robt. Moore, Architect, 7, Albert-road, Middlesbrough	" 11
Middlesbrough—House at South Bank		C. C. Doig, Architect, Elgin	" 12
Longmorn, Elgin—House		Morgan and Hodge, Architects, Prudential Buildings, Newport, Mon.	" 12
Llandaff—Villa		J. Whalley, Town Clerk, Rawtenstall	" 12
Rawtenstall—Fire Station and Stables		W. Stokes, 157, High-street, Queensborough	" 12
Queenborough—Congregational Chapel		Horsfall and Son, Architects, Lord-street, Halifax	" 12
Halifax—Stables, Washer-lane Dyeworks		Rev. R. V. O. Groves, Tolleshunt d'Arcy Vicarage, Essex	" 12
Tolleshunt d'Arcy—Church Restoration		J. O'Neill, Clerk, North Brunswick-street, Dublin	" 12
Dublin—Alterations at Workhouse		John Watkins, The Emporium, Brynmawr	" 12
Brynmawr—Four Shops, Beaufort-street		P. McGreevy, Clerk, Ballymahon, Ireland	" 13
Newtown, Ballymahon—Doctor's House and Dispensary		E. Lascelles, Market-street, Downpatrick	" 13
Downpatrick—Two Houses, Circular-road		Raymond Berry, Architect, South Owmam	" 13
South Owmam—Two Farmhouses		Thomas Thomas, Moncham-street, Ross	" 13
Rhos, Ruabon—Alterations, Welsh Baptist Church		Alfred A. Millward, Clerk, Vestry Hall, Pancras-road, N.W.	" 13
Dartmouth Park Hill—Infirmary, Alterations		E. J. Hughes, Architect, Riverside, Newhaven	" 13
Newhaven—Premises in Chapple-street		Geo. Mason, Clerk, Jarrow	" 13
Jarrow—Additions, Higher School		A. E. Stallard, Architect, West-street, Havant	" 13
Havant—Vagrant Wards		W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	" 13
Canterbury—Demolition of Seven Cottages, Rutington-lane		R. and R. C. Horsfall, Architects, Halifax	" 14
Halifax—Alterations Washer-lane Dye Works		H. H. Hickmott, Town Clerk, Rotherham	" 14
Rotherham—Swimming Bath, Market-street		L. A. McDonnell, Architect, 1, Clare-street, Dublin	" 14
Celbridge—Additions to Workhouse		J. W. Cornwell, Bullfield Farm, Rowley Regis	" 15
Rowley Regis—School		R. C. Blackwell, Down-place, South Harting, Petersfield	" 15
Harting—School Enlargement		The Directors of Society, Clayton-le-Moors	" 15
Clayton-le-Moors—Thirteen Houses		Lambert and Rees, Architects, Bridgend, Glam.	" 15
Bridgend—Town Hall Alterations		Jas. Perry, Architect, Buckie, N.B.	" 15
Cullen, Banffshire—House, North Castle-street		F. Bligh Bond, F.R.I.B.A., Corn-street, Bristol	" 15
Alveston—Commemorative Parish Hall		W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff	" 17
Cardiff—Docks Branch Free Library		Rev. E. Gillfillan, the Manse, Rallou, Larne	" 17
Rallou, Ulster—Additions, Presbyterian Church		Percy Griffiths, A.M.I.C.E., 55, Parliament-street, S.W.	" 17
Cromer—Boiler and Exhauster House		Edgar Kempson, Clerk, 121, West-street, Farnham	" 17
Cronldiff—School Infirmary		G. E. Halliday, Architect, 14, High-street, Cardiff	" 17
Cardiff—Completion St. Catherine's Church		Jones, Richards, and Budgen, Architects, 13, St. Mary-st., Cardiff	" 17
Cardiff—Albany-road Wesleyan Chapel		Ministry of Agriculture, Bucharest	" 18
Jassy—Industrial School		Medley Hall, Architect, 29, Northgate-street, Halifax	" 18
Holdsworth—Barn and Mistal		A. Marshall Mackenzie, Architect, 1, Bon Accord-street, Aberdeen	" 18
Huntley—Morrison Wing, Scott's Hospital		W. C. Williams, Architect, 29, Southgate, Halifax	" 18
Halifax—Additions to Shaw Lodge		C. S. Adye, M.S.A., County Surveyor, Trowbridge	" 18
Devizes—Recreation Room, Asylum		C. M. Shiner, A.R.I.B.A., 2, Walbrook, E.C.	" 18
Grays, Essex—Bridge-road School		R. Scrivener and Sons, Architects, Hanley	" 19
Highley, Salop—School		Geo. Gow, Tregothnan Office, Truro	" 19
Little Trewirgie, Probus—Farm Buildings		T. Duxbury, Gas Manager, Middleton	" 19
Middleton—Raising Gasworks Roof		E. Pitts Fenton, Clerk, Union Offices, Tanner-street, S.E.	" 20
Horselydown—Laundry at Workhouse, Parish-street		A. Beaumont, County Surveyor, Beverley	" 20
Eschurch—Additions Police-station and Courthouse		Williams and Gould, Hon. Secs., Church House, Exeter	" 22
Exeter—Emmanuel Church		Hon. Reginald B. Brett, Secretary, 12, Whitehall-pl., London, S.W.	" 26
Gateshead—Post Office		Telford, Gunson, and Son, 10, Marsden-street, Manchester	" 27
Crumpsall—Vagrant Wards at Workhouse		J. Whitworth, 21, Millgate, Rochdale	" 27
Rochdale—Ten Houses in Howarth Cross-street		E. T. Sims, Hon. Sec., Portsmouth Lawn, Southampton	" 27
Southampton—Avenue Congregational Church		J. Crawshaw, Architect, 54, Otley-road, Shipley	" 27
Shipley—Twelve Houses, Windhill Crag		Davidson and Beadle, Architects, 33, Grange-street, Newcastle	" 27
Shipmoor—Five Houses		Fairbank and Wall, Architects, 3, Manor-square, Otley	" 27
Otley—Shed, Barras-lane		Owner, Rose and Crown, New Haddington Barn	" 27
Penshaw—Twenty Houses		Silcock and Reay, Architects, Octagon Chambers, Bath	" 27
Tiverton-on-Avon—Schools		J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	" 27
Audenshaw—Alterations, St. Stephen's Schools			" 27



## BUILDINGS—continued.

Ballinlirlick, Co. Sligo—Creamery	Co-operative Dairy Society	M. Jennings, Secretary, Ballinlirlick
Buckhurst Hill—Two Pairs Semi-detached Villas		— Batting, 7, John-street, Adelphi, W.C.
Leeds—Eight Houses		Owner, 7, Cross Belgrave-street, Leeds
Leeds—Two Semi-detached Villas, Roundhay		P. Robinson, 72, Albion-street, Leeds
Heywood—Houses, Derby-street and Wham-lane		Secretary, Millbank Brick Co., Heywood
Nottingham—Villa	T. Moody	H. Sulley, Architect, Albert Chambers, Nottingham
Guide Bridge—Alterations, Railway Hotel		J. H. Burton, Architect, Guide-lane, Hoolley Hill
Failsworth—Business Premises, Old-lane	Industrial Society	F. W. Dixon, Architect, Trevelyan Buildings, Manchester
Halton, Leeds—Five Houses, and Alterations to Four Houses		J. Butler, Sunnybank House, Halton
Heaton—Four Houses		John Jackson, Architect, Barry-street, Bradford
Halifax—Additions, Copley Mills		A. G. Dalzell, Architect, 15, Commercial-road, Halifax
Draperstown—House		John Hutchison, Carnamoney, Draperstown
Clayton-le-Moors, Clubhouse		W. Hopwood, Lower Barnes-street, Clayton-le-Moors
Balvicar, N.B.—Ten Houses		Slate Works Office, Balvicar
Aberystwith—Shiloh Chapel School		Hipkiss and Bassett, Architects, Terrace-road, Aberystwith
Buckhurst Hill—Two Villas		J. Batting, 7, John-street, Adelphi, W.C.
Kirton—Malting, Warehouse, and Six Cottages		Eyre and Southall, Architects, Gainsborough
Pontefract—Seven Villas		Tennant and Bagley, Architects, Pontefract
Newcastle-on-Tyne—Pulling Down 50 & 52, Northumberland-st.		Wm. Newcombe, Architect, Pilgrim-street, Newcastle
Pontypool—House and Shop, Crane-street	Wooley and Co.	N. M. Brown, A.R.I.B.A., Somerton-road, Newport, Mon.
Carlisle—Stores Extensions	South End Co-operative Society	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle
Chilwell, Notts—Four Shops	Working Men's Co-operative Society	E. R. Ridgway, M.S.A., Long Eaton
Walsall—Leather Factory		Fred. W. Cross, Architect, 2, the Bridge, Walsall
South Meisham—All Saints' Church		Henry Hall, F.R.I.B.A., 19, Doughty-street, W.C.
Ballincurra—Additions to Stores		John H. Bennett, The Maltings, Ballincurra
Walsley—Primitive Methodist School	Trustees	W. J. Taylor, Architect, 88, Bank-row, Sheffield
Smethcote, Salop—Additions, National Schools		A. B. and W. S. Deakin, Architects, Pride Hill, Shrewsbury
Rochdale—Five Houses, Dover-street	Jno. Butterworth	Bamford and Brocklebank, Surveyors, 68A, Yorkshire-st., Rochdale
Nottingham—Technical Centre, Leen-side	School Board	A. H. Goodall, Architect, Market-street, Nottingham
Nelson—Seven Houses, Princess-street		R. Blakeborough, 51, Wilkinson-street, Nelson
Darlington—House, Russell-street East	A. L. Smith	Isaac Robinson, 3, Park-place, Darlington
Buckhurst Hill—Semi-detached Villas, the Drive		Edmond Egan, Architect, Loughton
Burnley—Three Shops, Yorkshire-street	Wm. Stones	Chas. Parsons, Architect, 9, Gramshaw-street, Burnley
Hobson, Co. Durham—House and Shop		T. H. Stafford, South Garesfield, Lirtz Green
Barwick-in-Elmet—Additions to Churchyard, &c.		Rev. Canon Hope, Barwick-in-Elmet
Beeston—Pair of Villas		J. Huckerby, Surveyor, 8, the City, Beeston, Notts
Acharacle, Oban—Manse		Rev. Neil McKinnon, Acharacle, N.B.
Tregony, Cornwall—Church Restoration		Rev. J. F. Reeves, Tregony Rectory, Grampond
Sleetburn—Additions to Primitive Methodist Chapel		Plummer and Burrell, Architects, Durham
Sheffield—Workshop, Saville-street		Spear and Jackson, Etna Works, Sheffield
Heaton Park, Prestwich—Conservative Club		P. D. Lodge, M.S.A., 5, Cross-street, Manchester
Pelton Fell—Shops	W. Wilson	E. Bowman, Architect, 52, Westgate-road, Newcastle
Pentrych—Two Villas	Co-operative Society	J. Jenkins, Sunnybank House, Pentrych, Wales
Nelson—Four Houses and Shop		Owner, 49, Fir-street, Nelson, Lancs.
Middleton—Branch Stores, Higher Wood-street		F. W. Dixon, Architect, Union-street, Oldham
Manningham, Bradford—Three Houses and Shop		Fairbank and Wall, Architects, Bradford
Leith—Improvements, St. John's Church		A. and R. McCalloch, Architects, 3, Bernard-street, Leith
Leeds—Factory, Cooleridge-street		J. Dickinson, Cross Fountain-street, Leeds
High Spen—13 Cottages	S. Rhodes	Secretary Consett Iron Co., Blackhill, Co. Durham
Witton Gilbert—Institute		Secretary Consett Iron Co., Blackhill, Co. Durham
Hawker—House and Stables		J. J. Milligan, Architect, 77, Baxtergate, Whitby
Dukinfield—Offices, Half-Moon-street		John Stafford, Town-lane Ropery, Dukinfield
Denaby Main—100 Large and 50 Small Cottages		Colliery Offices, Denaby Main, Rotherham
Derby—Alterations to Vulcan Ironworks	Ley's Malleable Casting Co.	E. R. Ridgway, Architect, Long Eaton
Burnley—Rebuilding Church Institute		Thos. Bell, Architect, Burnley
Belfast—Business Premises, Berry-street		W. J. Moore, Architect, Whitehall Buildings, Belfast

## ENGINEERING.

Belfast—Electrical Lighting Plant	Corporation	Sir Samuel Black, Town Clerk, Belfast	May 8
Blackburn—Electrical Tramway Equipment	Corporation	R. E. Fox, Town Clerk, Blackburn	8
Omagh—Cooking and Laundry Appliances at Workhouse	Board of Guardians	W. Cathcart, Clerk, Omagh	8
Doncaster—Water Supply	Rural District Council	W. Spinks, C.E., 31, Prudential Buildings, Leeds	8
Aberlour, N.B.—Distillery Reservoir		R. Thorne and Son, Aberlour	8
Godley, Hyde—Works to Reservoir	Manchester Corporation	Chairman, Waterworks Committee, Town Hall, Manchester	8
Catania, Sicily—Harbour Works (£60,000)	Italian Government	Ministry of Public Works, Rome	10
Arbroath—Gas-holder	Gas Co.	R. S. Carlow, Gas Manager, Arbroath, N.B.	10
Leyland Hundred—Repairing Various Bridges	Lancashire County Council	Wm. Radford, Bridgemaster, 19, Brazennose-street, Manchester	10
Tillycain, N.B.—Waterworks		B. Reid and Co., Guild-street, Aberdeen	10
Castlebar—Cooling Apparatus at Asylum	Rural District Council	Medical Superintendent, the District Asylum, Castlebar	11
Gongleton—Water Pipes (1,300, Sin. diam.)	Austrian Government	J. Wyatt, All Saints', Shrewsbury	11
Galicia—Railway (50 miles)		Ministry of Railways, Vienna	12
Manorhamilton—Water Supply Works		R. H. Dorman, County Surveyor, Armagh	12
St. Pancras—Seatings for Lancashire Boilers, &c.	St. Pancras Vestry	C. H. F. Barrett, Clerk, Vestry Hall, Pancras-road, N.W.	13
Aberdovey—Storage Reservoir (two million gals.)	Town Urban District Council	M. W. Davies, C.E., 3, Gloucester-place, Swansea	13
Carlów—Range and Bath-room Fittings, Lunatic Asylum		The Clerk, Lunacy Committee, Carlów	14
Clitheroe—Gas Pumps	Gas Committee	R. Barrett, Gasworks Manager, Clitheroe	15
Sutton Harbour—Improvements and Stone Quay	Improvement Co.	H. Masterton, 1, Buckland-street, Plymouth	15
Hinchley—Gas Plant and Apparatus	Urban District Council	Geo. Helps, Gasworks Manager, Hinchley	17
Hinckley—Gas Apparatus	Urban District Council	Chairman Gas Committee, Hinckley	17
Wispington—Repairs to Three Bridges	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Thimbleby—Repairs to Road Bridge	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Edlington—Repairs to Road Bridge	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Swansea—Deepwater Dock Entrance	Harbour Trustees	A. O. Schenk, C.E., Harbour Offices, Swansea	18
Liverpool—Additions, Refuse Destructor	Corporation	Town Clerk, Municipal Buildings, Liverpool	18
Portrane, Co. Dublin—Heating and Ventilating New Lunatic Asylum		G. C. Ashlin, Architect, 7, Dawson-street, Dublin	24
Donegal—Water Supply for Callinboy Lough	Board of Control	J. L. D. Meares, C.E., Town Hall, Newry	28
Ashby-de-la-Zouch—Waterworks	Urban District Council	W. A. Musson, Clerk, Ashby-de-la-Zouch	June 1
Wakefield—Electric Lighting Plant	Board of Guardians	H. Beaumont, Clerk, Union Offices, Wakefield	2
Brussels—Local Light Railways, Les Engghien to Soignies		Secretary of Local Railways, 15, Rue de la Science, Brussels	6
Bulgaria—Railway from Rustchuk to Tirnovo	Bulgarian Government	Ministry of Public Works, Sofia	7
Witham—Gas Engine	S. Metropolitan School Managers	Clerk to Board, Brighton-road, Sutton, Surrey	—
Keswick—Strengthening Middle Beck		D. N. Pope, Land Agent, Keswick	—

## FENCING AND WALLS.

Bangor, Co. Down—Boundary Wall (60ft. by 10ft. high)	Gasworks Commissioners	F. Pollock, Town Clerk, Bangor	May 10
Gosport—Boundary Wall and Gates, South-street Depot	Urban District Council	The Surveyor, High-street, Gosport	12
Atherton—W.I. Railing (1,100 yards, 4ft. 6in. high)	Urban District Council	D. Schofield, Clerk, Atherton, Lancs.	12
Ellon, N.B.—Stone Walls to Cemetery		Wm. Davidson, Architect, Ellon	12
Huddersfield—Walls (1,150ft. by 8ft.), Crossland Moor	Board of Guardians	J. Kirk and Sons, Architects, Huddersfield	16
Hoxton—Railing in Charles-square	Shoreditch Vestry	J. R. Dixon, Surveyor, Town Hall, Old-street, E.C.	21
Dewsbury—Boundary Wall at Westtown		Holton and Fox, Architects, Westgate, Dewsbury	—

## FURNITURE AND FITTINGS.

Hither Green, Lewisham—Park Fever Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Norfolk-street, Strand, W.C.	May 17
Selly Oak—New Workhouse Infirmary	King's Norton Board of Guardians	E. Decker, Clerk, Selly Oak Workhouse	24

## PAINTING.

Battersea—Relief Station, Latchmere-road	Wandsworth & Clapham Guardians	A. N. Henderson, Union Offices, St. John's-hill, S.W.	May 8
Kensington—Canal Bridges	Vestry	W. Chambers Leete, Vestry Clerk, Town Hall, Kensington	11
Manchester—Monsal Hospital	Corporation	City Surveyor, Town Hall, Manchester	12
Hull—Charter House Estate Properties		R. G. Smith, Agent, 1, Cogan Chambers, Hull	15
Stockport—Hollywood Park	Parks Committee	J. Atkinson, C.E., Borough Surveyor, Stockport	17
Shrewsbury—Market Interior	Corporation	W. C. Eddowes, Borough Surveyor, Shrewsbury	18
Rotherhithe—Lower-road Infirmary	St. Olave's Union	E. Pitts Penton, Clerk, Union Offices, Tanner-street, S.E.	20
Halifax—Painting Copley Mills and over 160 Cottages, &c.		A. G. Dalzell, Architect, 15, Commercial-street, Halifax	—
Morley—Peel-street Mills		S. Rhodes, Prospect House, Morley	—
Longton—All Public Buildings	Corporation	J. W. Wardle, Borough Surveyor, Longton, Staffs	—

## PAVING BLOCKS.

St. Marylebone—Swedish Wood Paving Blocks (1,900,000, 6in. by 9in. by 3in.; 700,000, 5in. by 9in. by 3in.)	Marylebone Vestry	W. H. Garbutt, Vestry Clerk, Court House, Marylebone-lane, W.	May 15
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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### GAINS AND LOSSES.

IN one of his essays Macaulay compares the progress of the experimental sciences with that of the imitative arts. He says:—"Ages are spent in collecting materials, ages more in separating and combining them. Even when a system has been formed, there is still something to add, to alter, or to reject." In this description we may read the history of the last century of architectural progress. We have been collecting and arranging the vast hoard of materials bequeathed to us by antiquity; but how much have we been able to transmit to the future? Collecting and classifying are easy; thousands can take part in these tasks where only a few can appropriate from these materials or recreate a form or a method at once suitable and beautiful. Our appropriation of the stock of ideas has made it easy to build in any style, to carry great structures of iron and steel over wide rivers, to construct roofs of mighty span—in fact, to apply the knowledge and experience handed down to us, and to make architecture, in short, a comparatively easy acquirement; but these facilities have not made us creative. "The ruder age of simple words and vivid impressions" gave to our predecessors something we have lost nowadays. We here take stock of a few of those new materials and arrangements which have distinguished recent times, and inquire whether we have gained or lost anything by them, whether the experimental science of our age has been turned to the best account in our buildings, and whether we have become really richer for our acquisition? These are questions that press home to us particularly just now. One conclusion must be drawn. What we have gained in science and contrivance we have lost in solidity and comfort. In our buildings and other industries, the law of compensation has been apparent. The science displayed in our construction and our sanitary details has not been 'all gain, for we seem to have lost that sense of proportion between what is necessary for our physical comfort and enjoyment, and those emotions which contribute to the artistic appreciation. We build with greater precision our houses and public buildings; structural matters, sanitary, heating and ventilating arrangements, are better understood now than ever they have been, and yet we are always trying to harken back to past ages when we desire to make our rooms and apartments genial and decorative. Take, for example, the modern fireplace. The laws of combustion have been studied and made quite obvious and simple, and nothing can exceed in efficiency the construction of the modern open firegrate, so that no rapid combustion of the fuel can take place, and little heat be wasted. The manufacturer of grates has done his best to produce economical stoves of iron and fireclay at the lowest cost, and the decorative tile-maker has made them ornamental to the eye. But all to no purpose. The house-owner and his family sit shivering on a cold day before their 2ft. or 3ft. of open grate piled up with coal or asbestos, and long for the revival of the wide, old-fashioned fireplaces and chimney-corners where the eye may rest on glowing logs on flat hearths. The ornamental tiled hearth and jambs only aggravate the sense of discomfort, and are almost a satire on the inadequacy of modern science. Even those of our better and larger residences, where an attempt is made to bring back the large recessed

fireplaces and hooded mantels for artistic effect are often little better, for the appearance, and not the reality, has been studied; we have the modern firegrate inserted in a recess which effectually prevents the radiation of heat into the room. What is to be said of other more essentially scientific modes of heating buildings—that of hot water or air? Is the typical Englishman ever likely to fit his house with pipes and coils? Again, the science of ventilation has been brought to a condition of great efficiency theoretically; but we cannot admit that it is always applied successfully by those who have adopted the most elaborate mechanical methods. Scientific theory is one thing, successful application another. Modern systems of extracting vitiated gases, disconnecting sewers, and expelling the germs of disease are excellent in theory; but we have no positive proof that they have appreciably diminished disease. Cleanliness and sanitary regulations have done much more.

But to refer to more directly architectural changes—those which distinguish our modern buildings and methods from the older regime. We have said we have lost solidity and comfort. What have we in return? Our methods of building and construction are far more complex than those which prevailed early in the century. Compare our old with our up-to-date specification or set of drawings. One is limited to a few traditional trades; the other shows many new ones—new systems of flooring and roofing, heating, ventilating, and lighting, besides various modes of finishing walls and ceilings which were quite unknown to our forefathers. That we have benefited by these changes cannot be denied; but we have also lost something. Our buildings are more fire-resisting for the introduction of iron and concrete; but they are more liable to be pulled and twisted about by the contractive and expansive forces of iron and heat during a fire than the old solid masonry and timber buildings were. We have many sorts of improved bricks and interlocking tiles, which admit of easy construction and resist the entrance of rain and moisture, but they are not so solid and capable of being made architectural. Certainly in heating and ventilating large buildings, our forefathers were far behind us, and they had no means of artificial lighting compared with ours. At the same time, these modern introductions have brought with them certain drawbacks: they have multiplied details, created a number of new problems for architects, and have hampered him in design. It is very galling for an architect to find, after he has been careful in studying a good interior, or arranging a piece of decoration, that the requirements of heating will necessitate the insertion of pipes along the side of a room, or that a ceiling must be spoilt by having to carry under it a pipe or two on brackets or suspenders. The water-pipes and radiator are sometimes incorrigible enough, and the ornamental iron casings are often worse than the naked coil. Here is one instance in which our improved knowledge has not been accompanied by a corresponding gain. In many other trades the engineer, and ironfounder, and plumber are more in evidence than the architect. They really have the arrangements in their hands, or the latter knows so little about the details that his ideas are set aside.

In a few of the great features of our buildings we trace the detracting and impeding influences of modern revivals. Take the roof. During the Revival art ceased altogether, and the carpenter and ironfounder usurped the design of roofs. The timber truss-roof was the perfection of modern carpentry as then understood. The architect had simply to specify it for buildings of all kinds, the art of framing was reduced to a set of rules and formula, which men like Tredgold and Nicholson did their best to

promulgate. What became of the beautiful architectural open-timber roofs of the 15th and 16th centuries? They existed; but that was all. No one thought of even copying them till the Gothicism appeared. Here were materials and types lying actually thick around, which the Classicist did not trouble to acquaint himself with, for he had all the wealth and refinement of Greece and Rome within his reach, and he was contented to accept his knowledge of timber construction from the carpenter. What art blindness! Here we see an accumulation of old architectural precedents actually stifling the creative principle, and leaving architecture at the mercy of archaeologists, connoisseurs, and carpenters. The life germ of real art had become almost crushed out by a revival of ancient fragments.

We are beginning to emerge from this age of dead antiquarianism a little, and we have been catching up the threads of the art which have lain long buried under the accumulated fragments of a century or more, but it is slow work. A number of revived and new features have been introduced. The low-parapeted roof has been supplanted by the high roof—a decided improvement, and one that has visibly helped our architecture; the bay and mullioned window has been introduced into our domestic and secular buildings, much to the alleviation of the flatness which was prevalent half-a-century ago; the gable has again been revived, and has encouraged the bricklayer's art; iron has replaced wood in many of the details of buildings. Lastly, the traditional methods of decorating our buildings are being taken up, and are becoming more independent of mere style. We have artists and craftsmen in wood, plaster, tiles, glass, and metal, each trying to bring back the spirit of the old work if only he can do so unshackled by commercialism. The "art furnisher" is the last modern representative. He copies old furniture and fabrics with great minuteness, and supplies them at the least cost; but he just misses those qualities of simplicity and character which we find in the old work, and which give them their value and charm. The carved leg of a chair costs more than a turned one which can be done in a lathe by the thousand; the Mediæval tapestry and embroidery and hand-painted decoration are reproduced by processes which rob them of all their beauty and individual character; but the public are apparently just as well pleased. Why do these productions disappoint? Is it not because the means of producing them, the processes used, are so numerous and cheap that very little art is required? The old tapestry-weaver, the worker of embroidery and metal; the carver and the potter of the old times were men who had followed the traditions of the crafts for generations, who were apprenticed to the trades they followed; whereas now the rich "art" upholsterer may be utterly ignorant of the crafts in which he deals—he may never have handled a tool or worked at a loom. And we may say the same of our great contractors, engineers, and decorators, who follow vocations made easy for them by the artistic genius of the past and the technical methods of the present. They are the inheritors only of what their predecessors created.

### PICTURES AT THE ROYAL ACADEMY.

#### III.

WE can hardly imagine two pictures so utterly unlike in composition and sentiment as those of Byam Shaw. His "Love's Baubles" in the Second Gallery is full of mediæval quaintness and pre-Raphaelite in style and colour; a Holman Hunt could not have given us anything more bold or startling in colour. On the contrary, the same painter's picture, "The Comforter," in Gallery IV., is meaningless and



conventional. The painter has introduced, beside a young man, presumably a husband, dressed in the most modern style, and sitting at the bedside of his dying wife, the seated figure of the Saviour. His white raiment and halo-circled head invest Him with a semi-mystical appearance which looks strangely out of accord with the rest of the picture. When will painters learn that to combine the mystical or the phantasmal with the realistic is unnatural?

John MacWhirter's "Alpine Meadows" (483), in Gallery VI., is one of the finest landscapes, and is a contrast to his other lurid, wild and romantic subject, "Childe Roland to the Dark Tower Came," in the Third Gallery. The dark and lurid tones of the frowning rock and chasm in that work represent a phase of natural grandeur which is not so often attempted as the more smiling mood of Alpine floral beauty. Mr. MacWhirter is a master of both. The steep hillside clothed with herbage and flowers stands in bold relief against the dark mountain background. The painter has been most lavish and faithful in rendering the mountain flora with all their brilliant variety of hue and beauty, and the Alpine tourist may here discover almost every flower, from the mountain saxifrage, with its stellate corolla, to the beautiful blue flower of the gentian. In this floral carpeting the painter excels without losing breadth.

Kate Perugini sends an idealised study of an invalid girl and young sister, entitled "Sympathy," which possesses much merit of handling and feeling. We cannot award much praise to the drawing in J. H. Lorimer's large, lamplight interior "A Dance." The lady at the piano looks diminutive in proportion to the other figures, and the perspective is faulty. The conflicting lights of evening and lamplight are, however, cleverly painted. The work of E. Blair Leighton, "In Time of Peril," is a strong work full of clever technique, and admirable in its subdued colour. A Mediæval knight and his wife and children, in a barge filled with costly treasures, have been rowed up to a riverside convent at night time, where the abbot, clothed in his abbatial garb, is receiving them. The costumes of the lady and her charge and the valuable contents of the boat, are painted with the scholarly accuracy of detail and refinement which we invariably find in this painter's work. The subject is, perhaps, scarcely equal to his picture of last year, where a party of marauders have pursued an old man to the doors of a nunnery, in which the story of persecution and sympathetic deliverance was more complete; but this last work exhibits all the resources of the accomplished painter of historic incident. Walter Langley's picture (528), "In Faith and Hope the World will disagree, But all mankind's concern is Charity," represents a cottage interior, with a large, old-fashioned fireplace with embers burning, where a kind-hearted housewife has taken in a little boy and given him a basin of porridge, is full of tenderness. Over the room are scattered vegetable and cooking utensils, the preparation for the mid-day meal. The little fellow seated near the fire is relishing his refreshment; but the subject itself would lose much of its force were it not for the simplicity and breadth of the room, its whitewashed and humble surroundings and homely character, and the way the light and shadow are handled. The colour and tone are in perfect sympathy with the story. "The Divine Sower" (541), by Sigismund Goetze, can hardly be pronounced a success. It is easy to degrade the conception of a religious subject when we attempt to pictorialise or represent it in a commonplace and natural sort of way, and our view of this painter's work is scarcely enhanced by this representation of the Heavenly Sower scattering seed over loose ground. The treatment is too realistic,

and is not quite the way in which Holman Hunt, E. Burne-Jones, Arthur Hacker, and others of their school would have treated the subject. We acknowledge, nevertheless, much cleverness in the painting; there is an exalted expression and tenderness in the face of the Saviour as he sprinkles the seed, and in the hosts of winged cherubs that accompany Him. B. W. Leader has another of his brilliant landscapes, "An Autumn Gleam" (554), a river and its bank of trees reflecting the ruddy tones of an evening sunset. The red glow of light just suffuses the upper part of the foliage, turning it from cool green to orange. Serenity and autumnal beauty pervade this and other evening landscapes of Mr. Leader, we can all admire them for their natural realism. A very different aspect of nature is presented in Yeend King's landscape, "The Windmill," near, where an open-air effect is given to the landscape. Broadly treated and cleverly painted in the wild flowering herbaceous plants, thistles, and brambles on the foreshore, is John Finnie's large landscape "Common Property" (555), a tract of waste ground by the sea. The glistening light on the water and the moving clouds add charm and life to the scene. As a piece of imaginative painting we must point to Alfred Ward's "Moon Maidens," a fairy scene in which female figures in blue whirling draperies, with golden tresses, are tripping down a hillside bathed in soft moonlight mist; but its merits do not justify the large size of the picture.

Amongst works which attempt to realise fiction and real life we may name William Logsdail's "Maria, from 'The Sentimental Journey'" (564), brilliantly painted. The woful and disconsolate face of Maria, seated with her father in a sylvan glade on a bank, is touchingly painted. Other subjects are Ida Lovering's "Gentle Jesus, Meek and Mild," a young mother, her children on their knees lisping their prayer in their night-dresses; William Dickson's "Close of a Weary Day," horses and plough in a field near a river, a moonlight effect; Frank Spence's "Homeward," delightful in its grey tone and flock of sheep on a wet road. Eyre Crowe's law-court scene (580), "Trial for Bigamy," is a crowded picture, and perhaps few subjects are so difficult to paint artistically as an interior crowded with black coats. There is a hardness also in the work, which does not improve it. More interesting and pathetic is George Clausen's picture of a "Mother" looking tenderly at her child asleep in a cot. It is early morning or evening, the cold daylight of the window contrasts with the light of the candle she holds in her hand. We may also notice among the less important works the following: Arthur Ryle's charming evening effect, fishing-boats at anchor on a smooth river (584); J. W. North's delicate spring foliage by the side of water (583), "The Promise of May"; J. H. Lorimer's clever and ingenious study, "A Dog and Mirror," a piece of reflection (591); Alfred East's fine landscape (597) with river through meadows, a cool morning effect. Two more important landscapes are H. W. B. Davis's "Banks of the Upper Wye" (602), cattle on the bank of the beautiful river under the shade of a large tree, the bright river forming a delightful contrast to the shaded coolness of the verdurous banks; and J. W. North's beautiful wooded hillside, a motley handling of delicate colour, a harmony of green and gold, "An English Western Valley," the boughs of red apples forming a rich complementary to the foliage. It must suffice to say of the portraits in this gallery that Mr. John S. Sargent has given a pleasing child-study in his "Hon. Laura Lister" (605), and Chas. E. Butler a portrait of a young lady in blue against a copper plaque and gold brocaded tapestry hanging—a nice harmony of colour.

Gallery VIII. need not keep us long. There is much that is hard and commonplace that ought never to have been hung—a remark that applies to nearly all the galleries. We first come to Hubert Herkomer's "Madonna," a pleasing portrait of a lady in black dress with light blue drapery background. W. Dendy Sadler does not quite rise to his usual level in his large subject-picture, "For Weal or Woe." We almost instinctively feel the lack of finish and warmth of colour in the surroundings, a crudeness scarcely expected from this careful painter of *genre*. The scene is an old-fashioned garden outside a country house— not perhaps of the best type itself. A wedding repast has been laid in the open, and the youthful pair are awkwardly standing before an elderly couple conversing, who are seated at one of the tables. The old man's smock suggests a small farmer. A little way behind the wedded pair a quizzical party of visitors of the house are amusing themselves at the expense of the twain—the bride, in a lace-flounced white skirt, and the very bashful and awkward bridegroom. In all this there is humour—the subject tells its own tale. Two other pictures deserve special mention. One is Robert W. Allan's fresh and noble sea painting, "The Wild North Sea" (662), without doubt one of the finest seascapes in the gallery. The view shows a harbour on the north coast, exposed to the full force of heavy seas which are breaking over the sea walls or quays, while a few masted boats and trawlers are at anchor within. The waves are sweeping over the quays. The colour and freshness and motion of the dark sea are happily realised; the swamped, wet quays show the deluging effect of the waves, and the craft and grouping of fishermen and others make an animated and grand piece of sea-painting. Another seascape (693), "A Beach," by W. T. Richards, where the incoming sea is breaking over the beach and reflecting the light, is full of freshness and atmosphere.

"Venus Binding her Hair" (664) hangs in the place of honour, and is by John W. Godward, a rising painter of classical themes. The undraped figure of Venus—a full-length—is exceedingly well modelled, if not perfect anatomically. The goddess of beauty stands upon a handsome leopard's skin in a Roman vestibule, one arch of which, draped, serves as a dark background; she is engaged in binding her hair. The flesh-tints and scheme of colour are subdued and refined. Amongst works of lesser importance we must place the delicate and graceful figure of a bright-haired maiden on a sea-beach, looking down at a shell at her feet, idealised and delicate in colour. The head of the girl as she bends is relieved by the calm and luminous sea. The idea is clever and refined. Arthur Hacker's "Sea Maiden" (688), is in a light scheme of colour, conceived and idealised with much beauty, though it is scarcely to be reckoned with his previous works. We may just note also the clever partial mist in David Farquharson's landscape, "In a Fog" (669), Mark Fisher's clever study of cattle, "Out of Harness," in a farmyard; David Murray's "Hamstead's Happy Heath" (640), hard and bare; S. Melton Fisher's "Children's Picnic," a large canvas (647), a sunlight effect, but exceedingly cold and colourless; and the effective landscape "The Fringe of the Wood" (618), by W. Arthur Howgate. J. J. Shannon's portrait of Miss Rhodes (639), may be mentioned for the decorative Japanese costume of the young lady, who is holding a pet guinea-pig in her arms.

#### THE ARCHITECTURAL ASSOCIATION JUBILEE.

WE resume our report from last issue, p. 659, of the celebrations on Wednesday and Thursday of last week of the completed fiftieth



year of the Architectural Association. On Thursday afternoon a well-attended

#### CONFERENCE ON TECHNICAL EDUCATION

was held at the R.I.B.A. Meeting-hall, 9, Conduit-street, W. Mr. Beresford Pite, F.R.I.B.A., the President, occupied the chair. The discussions were informal and conversational in character, and, as will be seen, no resolutions were passed. In opening the proceedings, the President introduced the subject of the work of the technical institutes as related to the Association as a burning question. The Association had, he said, to provide paid instructors for the various courses of lectures; but they found themselves handicapped by competition with the subsidised colleges, polytechnics, and technical institutes. This unfair competition brought about a reduction of the instructor's fees to the lowest possible point, and, although the classes were well attended, there was no money to pay for apparatus or other accessories. The Association did not mean to retire from the position it took up a few years before these rate-supported bodies were established. He said there could be no doubt that, owing to the subsidies they received from the ratepayers, the various technical institutes would be able to offer educational advantages at a cheaper rate than the Association. They did not propose to reduce their fees to meet this competition, but believed parents and guardians would realise that there were advantages to be derived from membership with the Association which would more than compensate for the additional outlay. If, in the future, the committee should be so fortunate as to come into endowment, they would probably consider the question of reducing the fees; but at present there was no such prospect. He asked members what policy they proposed to adopt?

Mr. H. D. SEARLES WOOD remarked that the great advantage of the A.A. had been the friendships formed in their classes?

Mr. J. E. DROWER said, in a polytechnic a youth could not gain a general knowledge of all trades; he had to stick to the class learning the one trade he intended to follow. In his A.A. class on quantity surveying he endeavoured to give just such knowledge of the subject as any well qualified architect ought to possess; but in a polytechnic the student would be trained to be quantity surveyor and nothing else.

Mr. T. M. RICKMAN asked, if tuition could be gained just as well and as cheaply elsewhere, why should not the committee look the question fairly in the face and carefully consider the advisability of dropping certain unremunerative classes?

Mr. HAMPDEN W. PRATT deprecated the suggestion that had been made, that the Association should apply to the Technical Education Board for a grant in aid; if they made such an application it would, he believed, wreck the Association as a mutual-aid body. They were doing a work of their own in which no technical school could supplant them, and they had been something more than a mere educational body—a band of students united for mutual assistance, and he trusted this aim would be kept in view in the future as in the past. In his view, the only practical way of improving their curriculum was to afford facilities for visiting workshops, and to drop the outside subjects, which were only taken up by a very few members, and which were not remunerative in fees. It was desirable that architectural students should seek to keep themselves together as a class.

Mr. A. W. EARLE did not think there would be any difficulty in getting a grant in aid from the London County Council.

The President remarked that they might be certain that no ratepayers' money would be voted them, except on the conditions that stringent control was exercised over the classes.

Mr. W. H. SETH SMITH mentioned that two years ago the committee entered into negotiations on the subject, and found that the conditions would be too onerous to justify them in proceeding.

The President confirmed this, adding that, in his judgment, to seek such a grant would reduce the Association to the level of a technical school. Hitherto if there was a real demand for a class in any subject, it had been possible to arrange one under the Association. He gathered that the general feeling of the meeting was decidedly against seeking any grant from public sources.

Mr. OWEN FLEMING said it was clear artistic training could not be carried on at the Marlborough-street studios, owing to the lack of space.

Professor T. ROGER SMITH pointed out that the object of the technical institutes was for the training of artisans; that of the Association was for the training of young artists, and he hoped the distinction would never be lost sight of, and that they would loyally adhere to the Association as at present constituted.

#### ARCHITECTURAL EXAMINATIONS.

The President remarked that there was a further subject for consideration—What studies should be compulsory in an architectural examination? He asked what was intended to be the ultimate result of examinations, if not to close the ranks of the profession against men who were incompetent to build either decently or honestly. It was necessary in the interests of the building owner that the adviser should be capable of giving advice—that the designer should be capable of design was indeed another matter. As to the R.I.B.A. examinations, he suggested that the first or preliminary examinations should stand as at present; the second or intermediate examination now dealt with questions in art and science. He would propose to eliminate art matters from the obligatory tests, and associate them with an Honours course as preliminary to passing in Honours at a later period. He would, however, retain the requirements for drawings so far as they related to construction and pure draughtsmanship. In the third, or final, qualifying examination Art and Design should form an Honours course, and the Science and Practice section ought to be strengthened. This qualifying examination should be taken first, and then the candidate might sit for Honours in art, its history and criticism; Greek archaeology, artistic draughtsmanship, perspective and water-colour. It should also deal with design. Such an examination in Honours would tend to produce thoroughness in work, with satisfactory results alike to the student and his clients, and undoubtedly, the President added, it might enable the high-class man to charge more than the ordinary practitioner, and might help to solve the Fellowship difficulty. He then discussed its bearing on the Registration movement. The A.A. studies should, he urged, be carried beyond the mere examination point; indeed, architects should continue to be students all their days, and, to form an incentive for further study, something in the nature of a Grand Prix was wanted, to be open only to men who had passed the final examination. He concluded by inviting suggestions from the meeting.

A lengthened conversation followed, in which Messrs. HENRY LOVEGROVE, H. D. SEARLES WOOD, WILLIAM WHITE, F.S.A., T. M. RICKMAN, W. H. SETH SMITH, H. W. PRATT, C. H. BRODIE, A. W. EARLE, B. FLIGHT FLETCHER, W. BURRELL, J. E. DROWER, and others took part. The President, in closing the proceedings, said the public and the profession would be shocked if the Board of Examiners could be persuaded to exhibit the drawings and designs which had been executed by candidates during the examinations of the last few years. That such a state of things existed in the profession was, he thought, most unsatisfactory.

During the week there has been on exhibition in the Institute rooms an interesting loan collection of architectural drawings in pen and ink, pencil, and water-colour, illustrating the progress of draughtsmanship during the past fifty years. The exhibits are divided into periods of ten years. In the first and second decades—that from 1850 to 1860 and that of 1860-70—are grouped together drawings by Sir Gilbert Scott, G. E. Street, Alfred Waterhouse, W. Burges, R. Phené Spiers, J. K. Colling, T. Allom, Geo. Aitchison, J. P. Seddon, John Norton, C. F. Hayward, T. H. Watson, J. Tavenor Perry, T. Blashill, S. F. Clarkson, J. Belcher, and others. In the third period, 1870-80, are shown works by H. L. Florence, W. J. N. Millard, F. T. Baggallay, Hugh Stannus, Leonard Stokes, P. J. Marvin, and others. In the fourth period, 1880-90, are brought together examples of Beresford Pite, W. A. Pite, G. J. Oakshott, P. D. Smith, H. W. Brewer, F. G. F. Hooper, A. N. Prentice, A. Needham Wilson, H. D. Walton, and J. G. Sankey; while the later works, 1890-7, are drawings by A. E. Street, A. T. Bolton, Owen Fleming, E. A. Richards, W. H. Bidlake, Arnold Mitchell, John Begg, H. V. Lanchester, C. de Gruchy, and others. The collection reminded visitors that at the present time there is no classified collection of architectural drawings in existence other than is

to be found in the volumes of the professional press.

#### THE INSTITUTE ABROAD.

The annual burlesque of current events in the architectural world, which has now become an established feature in connection with the Association, was given in the evening. The meeting-place was again changed, the rendezvous this time being the compact and redecorated St. George's Hall in Langham-place, and only one performance was given, to which ladies were welcomed. Possibly owing to the admission of fair visitors, and to the fact that during the past two years ladies have sustained the female characters, the farce is changing its character from a drama into a spectacular display, in which gorgeous dresses and stage-mountings take the place of the smart dialogue and outspoken hits at the abuses of the day, and to many of the older members of the A.A. who remember the earlier and less dressy gatherings in Westminster Town Hall, the development is not altogether appreciated. The play has grown more decorous and less personal. The topical allusions are not so numerous, nor nearly so pointed, as in former years, and there is now no attempt to parody the current music-hall song of the day into drastic comments on current events, so that while the play is more easily followed and enjoyed by a mixed and to a large extent lay audience, the working member does not have so much fun for his money. At the same time, in noting the thinness of the plot, some allowance must be made for the fact that for some reason the play was entirely rewritten at the last moment, the original sketch by Messrs. E. Howley Sim and G. B. Carvill having been, owing to some occult censorship, replaced by a fresh book, compiled at very short notice by Messrs. Alfred Stalman and G. B. Carvill. Considering the difficulties presented by this sudden change of story, the play was excellently staged and rendered. The music was composed and conducted by Mr. Leonard Butler, was smoothly written, and many of the duets and songs were redemanded. An orchestra of instrumentalists added much to the success of the entertainment.

The play was admittedly an adaptation of "The Celestial Institute" with some reminiscences of "Morocco Bound," "Tribby," and other recent burlesques of similar class, and some eight-and-twenty characters assembled on the stage. The three travelling students, now so familiar, were John Jones (Mr. H. Seton Morris), Patrick McBrowne (Mr. W. W. Furlong), and Charlie Robinson, the hero of the evening (Mr. Stephanos Constanduros); the low comedian's rôle, Blarney Barnooley, a London adventurer and company promoter, was taken by Mr. G. B. Carvill, and an equally grotesque impersonation of the Sultan was given by his collaborateur, Mr. Alfred Stalman. Mr. Frank Collins made up as a sufficiently imbecile Secretary of the Institute, and Mr. F. D. Clapham a humorous Librarian to the same learned body. The members of the council were represented by Messrs. E. S. Collins, A. Cox, Frank Lay, H. A. Neubronner, John Ormrod, and T. H. Turner; and Mr. F. P. Allworth and Arthur Kelly appeared as members of the Sultan's bodyguard. The female characters were Zorah, Miss Grace Wylde; Lalah, Miss Ada Yerbury; half a dozen Moorish girls, students of the Institute—Casina, Hassana, Banana, Pajana, Sasa, and Lula, taken by Misses E. Black, Carvill, Dolly Maude, K. Rimell, Berthe Selig, and Ethel Williams. Miss Blanche Selig acted as Tricksey, Barnooley's ward, and four little Moorish boys (with white hands and blackened faces) were portrayed by D. Carvill, P. Albert, S. Elston, and E. Collins. The scene was laid somewhere on the south coast of the Mediterranean, the precise locality being as immaterial as the architectural style of the stage scenery, which was Moresque, with a strong flavouring of Queen Anne. In the first act the action took place outside the Institute. The curtain rose on a number of lady students, who are discovered singing, chatting, gossiping—in short, doing everything but their drawings. They are informed by Zorah that all are to be married to the officers and Council of the Institute, whose members are to make their choice in strict rotation of rank. The Librarian having made his appearance, the three travelling students of the A.A. enter, and are greeted with warmer feelings, and it is evident that Tricksey and Charlie will make a match of it unless the villain of the play should intervene. He is not long in placing himself in evidence. Barnooley comes



in, costumed *à la* Napoleon in "Sans Gêne," and learns that the President of the Institute is about to be elected, with a princely salary and the right to select the prettiest of the students as his wife. He decides to stand as a candidate and to win by hook or by crook. The election of a secretary, however, is a preliminary to the graver matter, and the low salary offered and severe requirements demanded (tempered, however, by the clause, "A Knowledge of Architecture not Necessary") created much amusement among the audience in view of a recent choice in another place. Next comes a scene between Barnooley and the Sultan, in which the latter is persuaded to venture on a game of cards. Both produce kings from up their sleeves, but the adventurer has the larger stock, and compels the dusky potentate to transfer to him a magic ring containing a diamond rather larger than a pigeon's egg. The scene now changes to a meeting of the Institute, at which, after an amusing, irreverent parody of the proceedings at 9, Conduit-street, each member of the council advances his own claims to be elected President, one being highly connected, another great on education, and a third has gained wealth as an arbitrator; but Barnooley, with the mesmeric power of a Svengali, produces his mystic ring, and compels a unanimous vote in his favour. He claims Tricksey as his bride under the terms of the charter, and the curtain falls on Act 1. The scene in the second act is laid inside the Institute. The maiden students are seen preparing the toilet of the bride in readiness for the wedding, when Charlie enters, and in a duet, which was deservedly encored, the young couple lament their fate, and swear eternal love. This is followed by a trio by the three young men. Again we see the Institute in session and solemn conclave. The Presidential address is cut short, as it is discovered by the discreet secretary that the reporters have left, and affairs are hurried up for the wedding festivities which are to follow. Before closing the proceedings, however, President Barnooley propounds a scheme for an architectural co-operative stores and a limited liability company, which shall dispose of the ring. The members at first jump at the suggestion, but presently realise that nearly all the profits will go to the wily President, and organise a revolt. The promoter is just being de throne when the Sultan reappears, reattired in armour, and declares that the ring was obtained from him by fraud, and that the election of President, having been secured by the use of this talisman, is likewise without effect. The curtain, of course, falls on the election in the stead of Barnooley of Charlie Robinson, and his marriage to Tricksey is a foregone conclusion. The play over, there were hearty calls for the "author," and Mr. Carvill bowed his acknowledgments in response to hearty and long-continued cheering.

## STABLE CONSTRUCTION AND SANITATION.—XIV.\*

### STABLE FITTINGS.

OF late years the general construction and arrangement of stable fittings have received great attention at the hands of manufacturers, so that at the present time an almost embarrassing assortment of well-designed, serviceable, and convenient appliances adapted for various purposes may be obtained at a comparatively small cost. Formerly the fittings of stables were almost entirely constructed of wood, and the old pattern wooden manger; with sloping overhead hay-rack, is familiar to all. In out-of-way places they had the recommendation of being easily made and repaired by the average carpenter; but, on the other hand, they were being continually damaged from the biting and gnawing of horses. The use of such an absorbent material has, however, been found to be a fertile source of spreading infectious diseases—particularly in large town stables—and many cases of farcy, glanders, &c., have been traced to this cause. Notwithstanding such a serious drawback, wooden fittings are still extensively used in country districts, and almost invariably in farm buildings of an ordinary character, owing to their relative cheapness. For modern stable fittings, wrought or cast iron has now taken the place of wood to a very large extent, as it possesses distinct sanitary advantages over the latter material. It is non-absorbent, cleanly in use, strong, cannot be

destroyed by the horses' teeth, presents a good appearance, and is readily washed and cleaned.

In the consideration of the general internal arrangement of stables, it is usually found necessary for the animals' welfare and comfort that they should be separated from each other—more

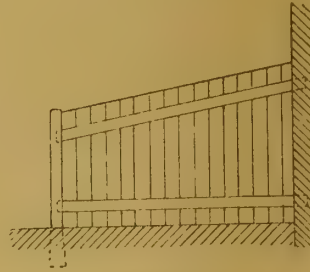


FIG. 143.

or less completely—so as to prevent them disturbing or injuring their immediate neighbours. Where entire separation is required, a series of loose-boxes are constructed as shown in Figs. 45 and 46. Stables which are divided into loose-boxes form the most comfortable and luxurious arrangement practicable. Such a method is frequently adopted for housing hunters and racers; but for ordinary purposes it is quite sufficient if the horses are separated from each other by a series of traverses or stall partitions sufficiently high and long to prevent the possibility of one horse biting or kicking another. The distance

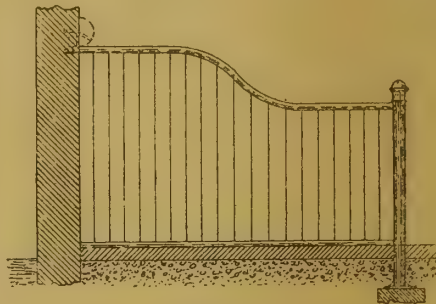


FIG. 144.

between the partitions should be sufficient to permit each horse to lie down and get up without being in any way cramped for space. They should be not less than 6ft. wide, whilst for large horses 6ft. 6in., or even 7ft. may be allowed with advantage.

As already mentioned, the stall divisions in farm stables are commonly constructed of wood, as shown in Fig. 143. The heel-post is usually of oak, 6in. by 6in. in section, and about 5ft. high, having two or three 5½in. by 1½in. deal rails framed into it, the other ends of the rails

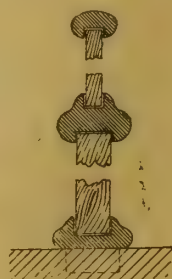


FIG. 145.

being pinned into the wall. Deal stall-boarding 1½in. thick is then nailed to one side of the rails.

On the grounds of cleanliness, neatness, and general efficiency, it is far better to substitute cast or wrought iron for the wooden heel-post and rails, as the extra cost thereby involved in the construction of an ordinary sized stable is inconsiderable. Fig. 144 shows a serviceable stall division of this character, filled in with 1½in. boarding. The top rail is curved or "ramped," and fitted with a wall socket at the upper end, so that the ramp may be taken out at any time, as, for instance, when it is required to replace broken

or defective boards. Instead of a curved rail, a straight-top rail may be used if preferred.

For better class stables the upper portion of the division is formed with open ironwork, so that the space between the stall divisions may be more easily ventilated. Examples of this arrangement are seen in Figs. 24 and 25, the space between the middle and top rail being filled in with iron bars. Fig. 145 is a transverse section through a stall division fitted with an iron sill, middle, and top rail. The space between the sill and middle rail is filled in with boarding (preferably teak or oak), whilst a ventilating grating is inserted between the middle and top rails. In some instances a solid panel is introduced at the head of the ventilating division, as indicated in Fig. 24, so that the horses may not see each other whilst feeding. Instead of plain straight bars, numerous ornamental patterns for ventilating ramps may be obtained.

In addition to the upper portion of the division

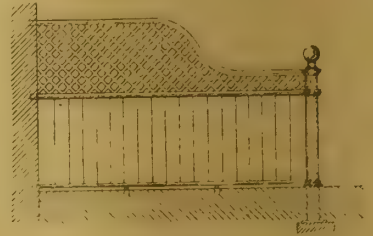


FIG. 146.

being formed with an open or ventilating grating, other designs are made which are fitted with a ventilating sill or a narrow ventilating panel near the floor. Fig. 146 is an illustration of a stall division fitted with a ventilating sill. It will be observed that the bottom rail or sill is slightly raised, so that an open space is left between it and the floor, in order to permit a certain amount of circulation of the air taking place at the ground level.

An improved form of ventilating-sill has been introduced, in which the sill is arranged with a narrow perforated panel for ventilation purposes. An iron ventilating head-plate is also fitted between the sill and middle rail at the head of the stall division, the portion under the manger

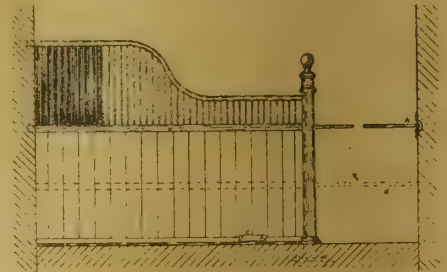


FIG. 147.

being perforated, thus insuring a better circulation of air throughout the stable, whilst at the same time it does not interfere with the complete separation of the stalls from one another. In army stables, similar results are obtained by fixing a wrought-iron grating under the manger at the head of each stall division, as indicated in Figs. 26 and 38.

For the better protection of valuable horses when housed in stalls, the divisions are frequently fitted with "sliding barriers," as shown in Fig. 147. The middle rail is hollow, and forms a case or sheath in which slides a stout iron bar. When necessary this is drawn out (as at A), and the end made secure in a slotted recess formed in the wall. By this means each horse is practically confined to its own stall, and should it become loose and restive at any time, is incapable of interfering with the other occupants of the stable. Fig. 148 is an elevation of the slotted wall-plate, which receives the end of the barrier. For additional security an intermediate rail and sliding barrier is sometimes provided as indicated at B, Fig. 147. The sill is shown with a "shifting-piece" at C, so as to allow the stall boarding to be renewed when damaged. Shifting-pieces are also provided to the intermediate rails when required.

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The height of the top rail of a stall-division is generally about 5ft. above the floor-level at the heel-post, and 6ft. 9in. to 7ft. 6in. at the head. The middle rail of a stall-division with ventilating ramp is from 4ft. to 4ft. 8in. above the floor.



FIG. 148.

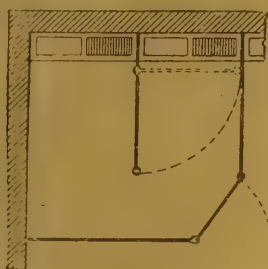


FIG. 149.

Sometimes it is found convenient to arrange the end stalls of stables in such a way that two stalls may be converted into a comfortable loose-box. Figs. 149 and 150 are the alternative plans of such an arrangement, in which the same space may be utilised for providing two stalls or a horse-box respectively. Fig. 151 is an elevation of the intermediate stall division. It is provided with an additional post near the head, to which the remainder of the division is hung. To convert the two stalls into a loose-box, the intermediate stall division is swung back as at A in Fig. 150, thus entirely shutting off one end of the manger fittings, as they would not be required when the space is used as a loose-box. The heel-post is then lifted out of its ground socket, and

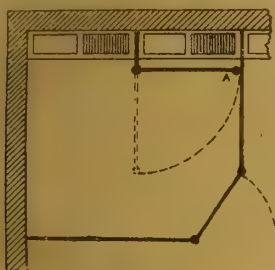


FIG. 150.

the surface of the floor made level at this point with an iron cover. All the working parts of the movable heel-post and hinged division should be of brass, so that they may not be rendered unserviceable by rust, should they be left unused for any length of time.

The doors of loose-boxes may be hung with hinges, or arranged to slide on top or bottom rollers. The hinges, fastenings, handles, and other fittings should be designed so that they do not project beyond the face of the door—whether it be open or closed—as such projections might cause serious injury to a valuable horse. Several excellent forms of safely latch, which are specially constructed for the doors of stables and loose-boxes, are now obtainable. These are so arranged



FIG. 151.

that the catch or tongue of the latch falls back, and is quite flush with the door and frame when open, but which automatically projects and secures the door when it is closed. The latches should be of the mortise pattern, and provided with flush drop-handles.

Where large numbers of horses require to be accommodated, and the strictest economy—both of space and outlay—must at the same time be exercised, as in tramway, omnibus, general

carriers, and army stables, the separation of the horses is effected by means of "hanging bails." These regulate the amount of space to be occupied by each animal; but they are sometimes the cause of much injury to restless or vicious horses, for in kicking and plunging they frequently get "cast" or entangled with the bail. For this reason the bails should be so hung that they can be easily loosed, and the horse released from its awkward and dangerous position.

With the use of bails, less breadth may be allowed than would otherwise be required for stall partitions. Fig. 152 is the elevation of a hanging bail as sometimes used in large stables. Each bail consists of two stout elm planks, 12in. to 14in. wide, 2in. thick, and 9ft. or 10ft. long. The upper plank is suspended by means of wrought-iron chains and hooks, the two planks being connected with a stout hinged joint. In some cases the lower plank is omitted. Several

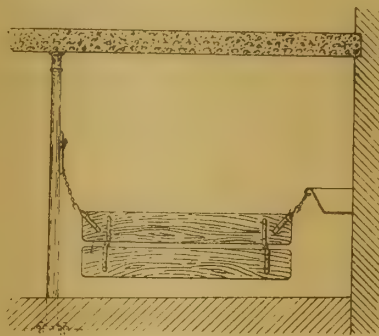


FIG. 152.

forms of "safety" attachment have been designed for the purpose of allowing the bail to be readily unhooked in an emergency. Where the arrangement shown in Fig. 152 is adopted, the end of the bail is quickly released by raising a sliding ring near the heel-post, which allows the hinged hook or catch supporting the bail-end to fall down. Self-acting bail attachments may also be obtained, the bail being so hung that the slightest vertical pressure causes the bail to fall to the ground.

Bails consisting of a stout iron rod or tube are

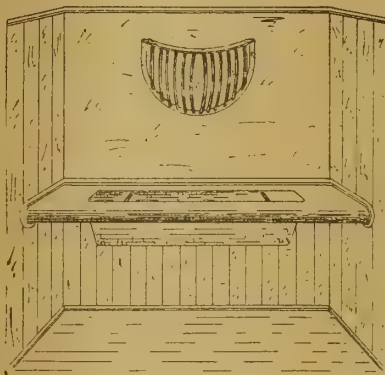


FIG. 153.

sometimes used instead of the wooden planks just described. Those used in army stables in this country are of this character.

At one time the manger-fittings for stables consisted of a wooden feeding-trough and sloping hayrack above. They are still used for buildings of cheap construction. Not only are they easily damaged and destroyed by the horses' teeth, but there are serious sanitary objections to them. Wooden mangers and hayracks provide a very favourable medium for the retention of disease germs, owing to the absorbent nature of the material, so that infection is liable to be transmitted from one animal to another by their use. These fittings should, therefore, be constructed of some impermeable material with a smooth surface, so that they may be easily cleaned. Sometimes mangers of glazed earthenware are used, but they are very apt to be damaged by rough usage. For general purposes iron mangers and hay-racks are found to give the most satisfactory results.

Fig. 153 shows a cast-iron manger-pan with wrought-iron overhead hay-rack, whilst Fig. 154 is

an illustration of the ordinary form of manger-pan, with water-pot and underhead hay-rack. Another type of fitting is seen in Fig. 155, in which the hay-rack is fixed on the same level as the top of the manger. This latter arrangement



FIG. 154.

is now generally considered to possess certain advantages over the two previously shown, as it permits the horse to extract the hay from the rack at the same level as its head, and so feed in a comfortable and unrestrained position. A modification of the last-mentioned type of manger-fitting is given in Fig. 156, the hay-rack being placed directly in front of the manger instead of at the side. A shallow recess is formed in the wall to contain the fodder, so that the rack grating is flush with the face of the wall. Any seeds or particles of dust fall into a seed-box or drawer below, which is removed and emptied from time to time.

When over-head racks are used, the animal is compelled to raise the head much higher than its normal position for every mouthful of hay that is taken, whilst the hay-seeds and dust fall directly

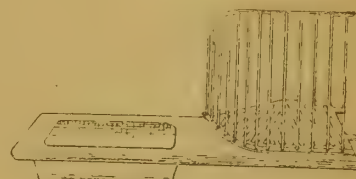


FIG. 155.

into the eyes and nostrils, thus causing a general sense of discomfort. Under-head racks, when made very deep, are objectionable, as the horse's head is liable to be injured by being suddenly withdrawn when disturbed whilst feeding. With some animals they are also the cause of fodder being wasted, as a horse will frequently turn out the coarser or inferior portions of hay with his nose, and which—falling on the floor—are trampled upon and rendered useless for feeding purposes. To avoid waste under such circumstances some under-head racks are provided with

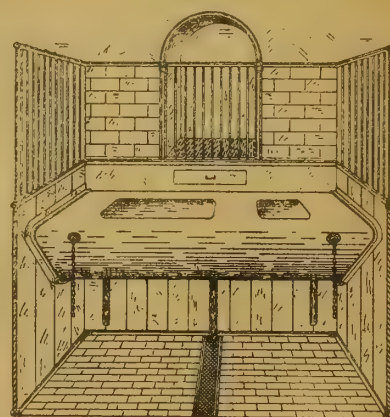


FIG. 156.

a sliding grid which rests on the top of the hay, and prevents the animal withdrawing more than a mouthful at a time.

#### ASBESTOS AND ASBESTIC.

THE general application of asbestos to various industrial and useful purposes is now well known by all interested in building. An article on this mineral and its varieties, read lately before the Society of Arts by Mr. Robert H. Jones, and which is advertised in our columns, calls attention to a very important plaster particularly valuable for structural purposes, walls,



roofs, partitions, and floors. A variety of asbestos, quite distinct from it, but equally valuable, has been discovered in the province of Danville, in Lower Canada. This particular variety has special uses, and is said to be nothing more than serpentine which occasionally assumes a fibrous character; its mineralogical name is chrysotile. In chemical composition both kinds are alike, and can be used for like purposes. Those who wish to study the properties of this substance and its conversion cannot do better than read the article to which we refer. Our more immediate object is to draw attention to the practical uses of asbestos, which is certainly of great importance to the profession. The recent calamitous fire at the bazaar at Paris very opportunely draws attention to the urgent need of some kind of fire-resisting coating or plaster such as that of which Messrs. Witty and Wyatt, Ltd., of 88, Leadenhall-street, are the agents in this country. If that ill-fated wooden structure had been coated with this material, the horrible sufferings of the unhappy victims could not have occurred, for it would have been impossible for the fire to have extended with any rapidity. As a wall plaster, asbestos appears to have a future. It requires the use of neither hair nor sand, the fibres affording all the coherence and strength required, and the pulverised rock supplying the latter ingredient. Composed exclusively of asbestos, it is fireproof, and a non-conductor of heat and sound, so that a room plastered with it is proof against fire and extremes of temperature, and the transmission of sound from one room to another rendered impossible. For this latter purpose, the spaces beneath floors and over ceilings can be filled with rough asbestos. Captain Fox, of the London Salvage Corps, said his substance appeared to be a most estimable article, and well worthy the attention of all architects. He was sure, if a fire broke out, it might, by the use of this material, be kept within reasonable limits, and he has certified, from experience of its fireproof qualities. Recent experiments at the U.S. Treasury Department have shown the value of asbestos plaster, and the officials of the supervising architect's office have all been impressed with its value. Sir Donald Smith's mansion at Glencoe has been plastered with asbestos, and the contractor, Mr. W. Baird, Edinburgh, says it is applied with "the greatest ease" and "a great saving of labour will be gained by using it." He also says it has dried without the aid of artificial heat, and will not crack—qualities of the utmost value in plastering. Messrs. Witty and Wyatt, Ltd., of 88, Leadenhall-street, E.C., are the sole London agents.

#### ADAPTABLE SPECIFICATIONS.

—XXXVII.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Continued.)

YEAR by year, as good painters' work grows better, bad painters' work grows worse. Past generations may have longed to scamp their productions as thoroughly, but misapplied science had not yet made this possible. Now, adulterated turpentine warranted never to dry, and brilliant-looking colours which may be trusted to fade in a fortnight, have been brought within everybody's reach, and the architect is never sure that they will not be tried on him. If his specification is stringent enough, he may, indeed, have them cleaned off after they are on, and require the work to be properly done. But painting is usually begun just when the building ought to be finished, for buildings are always a little, if not a great deal, behind time. The owner cannot wait. The wretched fraud palmed on him in the name of good oil paint has to remain. As long as it lasts it will be "tacky" and clammy, and every time he touches it he will blame—not the painter, not the builder, but in all probability the architect. The question is how the architect can most effectually prevent such stuff from being used. Of course, he can have samples submitted to him before the painting is begun, and to do this will prevent any accidental use of bad materials. But it will not prevent the intentional use of them; because the man who deliberately means to cheat will send in a good sample and will then not work to it. The practical lesson is, that architects should hold together more, and keep each other informed of the merits and demerits of the men they have to deal with. A profession divided against itself can never do its best, and until it does, it

will miss the general esteem and respect which it might otherwise rely on.

It is an article of faith with the speculative builder, and perhaps, in some cases, even with the too-enterprising contractor, that "anything which can hold a brush will make a painter." When such a creed prevails we need not wonder that much of the workmanship in this trade is but just worthy of the most "modern" of the materials. Materials may be divided into *vehicles* and *pigments*. Of the vehicles, *linseed oil* and *spirits of turpentine* are, or ought to be, the chief. Methylated spirit, containing a little shellac, a little linseed oil, and a very small quantity of castor-oil has sometimes been substituted for turpentine in order to make "inodorous paint." The only advantage of this, however, is to save the inmates of an inhabited house from the smell caused by painting it, and there is no inducement to use it in new buildings. Genuine oil of turpentine and genuine linseed-oil are better than all substitutes and imitations. Oil of turpentine, which painters call "turps," is distilled from crude turpentine—a resinous, sticky substance, which exudes from various sorts of pine-trees. When pure, it boils at 320° Fahr. Spread on a non-absorbent surface, it dries in about a day, forming a thin hard varnish—not a spongy or "tacky" one. If a piece of writing-paper is dipped into pure "turps" and then held to the fire, the liquid evaporates in a few minutes, leaving the paper fit for writing on with ink. If the "turps," on the contrary, has been adulterated with petroleum products, the paper will be permanently greasy. When these adulterants are used in large proportion their unpleasant smell, too, will betray them. They make the "turps" heavier and less inflammable than it is when pure. They do not evaporate fast, nor do they absorb oxygen freely, and the result is that paint in which they have been used never gets hard and firm.

"Turps," or oil of turpentine, is a "volatile" oil, and dries by evaporation. *Linseed oil*, on the contrary, is a "fixed" oil, and does not evaporate. It dries, however, though much more slowly than turpentine, by absorbing and combining with oxygen from the air. In this way it forms a tough and flexible coating to the surfaces over which it has been spread. But if linseed oil were simply used in the state in which it is obtained by crushing the seeds of the flax-plant, it would be too slow in drying for most of the painter's purposes. It dries, however, much faster after being "boiled," as the customary term is—that is, after being heated for some hours to a temperature 100° or more above that of boiling water. Fixed oils, such as this, do not really boil—that is, they cannot be made to give off steam which will condense again into a liquid like that which produced it. When enough heat is applied, they are decomposed, part of them being driven off as gases and vapours, and part being left behind in a solid or semi-solid condition. "Boiled oil," so called, is one of the most familiar and useful of the painter's vehicles; but even this, by itself, does not always dry as fast as he wishes, and some of his pigments still further retard its drying. The ordinary drying of linseed oil, as we have seen, is the result of its taking in oxygen from the air. But oxygen from other sources will have the same effect, and the easiest way of supplying the oil with additional oxygen is to mix oxidising substances with it. These the painter calls "*driers*": they all contain oxygen, and part with it easily. *Litharge*, or oxide of lead, is a drier much used for dark colours. This is frequently added, during the process of heating, to "boiled oil," which then forms what is known as "drying oil." For light colours, sugar-of-lead (acetate of lead) and sulphate of zinc, either finely ground or dissolved, are in favour. With zinc-white, lead driers have to be avoided, and sulphate of zinc or black oxide (peroxide) of manganese are recommended instead. Different kinds of driers should not, as a rule, be mixed, though there are cases in which experience has shown particular mixtures to be advantageous. Driers should not be used in excess, one part by weight of binoxide of manganese being enough for about 200 parts of zinc-white paint.

Drying oil brushed in a thin coat over an impervious substance like glass, ought to harden in a day, or even less. Unboiled linseed oil, on the contrary, would take a fortnight or more, especially if new. It improves by keeping, and should never be used till it is at least six months old. Paint made up with oil, and no "turps" dries tough and glossy. Paint made up with

turps, and with no oil beyond that which the pigment was ground up with, is flat or dead in surface, and has little cohesion. The painter, therefore, uses the one vehicle or the other, or mixes them together in different proportions, according to the result which he intends to produce.

Next to vehicles come the *pigments* which are mixed with them. The most indispensable of these is that which forms the "body" of the paint, and which should be solid enough and opaque enough to hide the grain of the wood, or the tones and markings of the substance, whatever it is, to which the paint is to be applied. The majority of colours, by themselves, have little "body." Hence they cannot be used alone, and are only fit for adding to some material which, when ground up with oil, will entirely conceal the surface which is coated with it. Such a material is *white lead*—a carbonate of the metals which, like most other things used in the painter's craft, is subject to very serious adulteration. Unfortunately it is poisonous, and injurious to the workpeople who manufacture it. The textbooks, too, almost with one consent, condemn it on another ground—namely, that when it is exposed to the action of sulphuretted hydrogen, it gradually turns brown or blackish. This surely could only have been held a failing in pre-sanitary times. Considering what an odious and injurious thing sulphuretted hydrogen is, the proper course when paint is discoloured by it is obviously not to change the paint, but to purify the atmosphere, and the sanitarist ought to consider it a redeeming quality in white lead that it warns him fairly when one of his worst enemies is lying in ambush. White-lead should not be left exposed to the air before being used, as this is liable to discolour it. Venice white, Hamburg white, and Dutch white are said to consist of white lead mixed in various proportions with its usual adulterant, sulphate of baryta. Zinc white—an oxide of that metal—is used to a certain extent in place of white lead. It is not affected by sulphuretted hydrogen, and it is not highly poisonous, and for these reasons it has been much recommended. The objections to it are, that it is less solid and opaque as a pigment than white lead—in other words, that it has less "body," and does not cover surfaces so well. Then, again, it dries very slowly, and does not last for outside work. The price-books give the cost of it per cwt. as rather less than that of pure white lead; but it does not go so far.

The "body" of the paint being decided on, the pigments have to be selected—unless, indeed, the work is to be finished without them, and to be simply white. Amongst the most permanent are the natural earths, such as yellow ochre, Roman ochre, red ochre, Venetian red, Indian red, raw umber, burnt umber, raw sienna, burnt sienna, Mars orange, brown ochre, and blue ochre. The blacks, which mainly consist of carbon, such as ivory black, bone black, blue black, and lamp black, are very durable. Cadmium red and cadmium yellow, cobalt blue, madder lake, purple madder, and brown madder have also a good reputation. The chromium colours, which, by their brightness, have taken the popular fancy, are not equally to be trusted. Chrome yellow, red chrome, orange chrome, and some other compounds of this remarkably colour-producing metal are much in use; but many things act on them chemically, and, in any case, their brilliancy is soon gone. Blues of any permanence, except cobalt, blue ochre, and the staring and untractable French ultramarine, are rather scarce; but indigo and even Prussian blue will last for some time where they are not exposed to strong sunlight. Scheele's green, Schweinfurth's green, and Vienna green should be avoided, as containing arsenic. The architect should beware of novel pigments, unless he is fully informed of their composition. An immense quantity of them—often very attractive in appearance—are now in the market, and are prepared from aniline or coal-tar colours, mixed with some heavy powder. They are extremely evanescent.

No matter how much care may be taken in insisting on pure turpentine and oil, on pure white lead and permanent pigments, the whole of the painting may be spoilt by imperfectly preparing for it, or by carelessly executing it. New woodwork first wants thoroughly dusting, or the paint laid on it is sure to be rough. Then the knots have to be "killed," or, in time, the resinous matter may ooze out of them and show on the face of the work. Knots that are very large or resinous should be cut out, and their

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places made good. Less dangerous ones may be covered with shellac dissolved in wood-naphtha, a mixture known as "patent stopping." Small holes in the work must be filled with putty, or, preferably, with "hard-stopping." Wall plaster requires all the loose particles to be removed by rubbing before the painting on it is begun. Cracks in it must be cut out, and stopped with plaster of Paris and fine stuff, or with Keene's cement, and when this stopping has set, it must be rubbed over to bring it to the general level. After these preparations, the actual painting begins. The first coat usually contains a large proportion of oil. The next may have about twice as much oil as "turps." In the third coat it is an old custom to reverse this proportion, and to let the "turps" be two to one. The fourth coat, again, is made up chiefly with oil, and wholly with it when a fifth, or flattening coat, is going to be applied. Flattening coats, of course, are mixed with turpentine almost free from oil; but to give them as much cohesion as possible, the coat on which they are laid should be scarcely dry, and should be mixed almost entirely with oil. The lower coats will then support the upper one, and the oil will strengthen the flattened colour without imparting a gloss to it.

### THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of this society on Monday evening last, after a resolution had been passed suggesting the presentation of a respectful address of congratulation to her Majesty, the discussion on Mr. Redman's paper on "Legal Incidents of Urban Property" was resumed by Mr. Pilditch, who pointed out the importance to surveyors and owners of the rule which forbade a man to derogate from his own grant. He quoted a case recently decided, "Broomfield v. Williams," in which the defendant conveyed to the plaintiff a piece of ground with a house upon it, looking on to other ground. There was no reservation in express terms of the right of the defendant to build on this latter, which, however, on the plan annexed to the deed had written across it "Building land." Shortly after the conveyance the defendant built two houses, interfering with the plaintiff's light; it was fully established that the plaintiff knew he was about to do so, but he contended that the houses were not like what he had been led to expect, and that a space of 5ft. or so between them and the boundary-wall was not let. Judgment was given for the plaintiff, but only to the extent of the building over this narrow passage. An important view was expressed by one of the judges of the Court of Appeal—viz., that the onus lay on the vendor or lessor of showing to what extent the lessee's rights were to be limited by this rule of non-derogation, and that the words written on the plan did not in themselves suffice to enable him to build so as to damage his lessee's rights.

Mr. F. K. Munton said that, as a solicitor, he found that no point gave more trouble to his profession than the complications of the law of landlord and tenant. It was so difficult to get at the various decisions which governed or varied the particular cases. The first cause of all this difficulty, he could not help thinking, arose from the extraordinary and extravagant language of most old leases. As it was more easy to follow a precedent than to make one, most persons adopted any old form which seemed to be sufficient, and used its language, however inappropriate it might be. Very few surveyors or lawyers could, under cross-examination, give anything like an intelligible definition of some of the covenants to repair which were embodied in some leases, and he thought the tendency of the Courts had of late been to regard those covenants which were expressed in too strong language as in themselves unfair, and to give decisions which almost neglected the words they were called upon to construe. Twenty-five years ago all ordinary well-conditioned houses were occupied on leases, while nowadays very considerable houses were held without any repairing covenants at all. That, he thought, was due to the litigation and trouble. He thought it would be a very great help to all interested in urban property if some body of professional men could be induced to draw up what he might term a "glossary," wherein such terms as "the usual clauses" might be defined, as now they were not. Did that term, for instance, restrain the tenant

from underletting? This was not clear to every lay mind. In cases where, at the expiration of a lease, the landlord called in a surveyor to draw up a schedule of dilapidations, and tendered it to the lessee, who again employed a surveyor to inspect the premises, there was always some difficulty as to who was to pay the expenses of the landlord's survey. It seemed to him that it was a necessary expense incurred in determining what was the work which the tenant would be required to do, and which he had agreed to do.

Mr. Howard Chatfield Clarke agreed with Mr. Redman, that if the preliminary negotiations for a contract were made conditionally on a proper contract being prepared, much subsequent trouble might be saved. With regard to derogation from the grant, the decision in the case of "The Birmingham and Dudley Bank v. Rose" laid down the rule that a lessee, knowing that adjoining land was to be used for buildings of a certain class and size, should have no remedy, for he should first have made all inquiries as to the future, and protected himself accordingly. It was clear, from the decided cases, that the surveyors could, with care, protect their clients' interests with regard to lighting. The case of Lord Dudley's tenants, where land was let for building purposes, but the right to get minerals underneath was reserved, was an interesting one. In that case the minerals had been worked, with the result of withdrawing the support from the tenants' buildings and land. The letting of a furnished house implied, as he believed all the Courts had held, a warranty of its habitable condition. With reference to the right to assign, he thought it very dangerous that the assignment of a building agreement should be allowed, and in his own practice he had always objected to such right being conferred on the lessee.

Mr. Howard Martin said, with reference to preliminary negotiations being regarded as forming part of a contract, it was not many years ago that a telegram was held not, in any case, to make a contract; but he believed that several recent decisions had recognised a telegram as completing a contract for the sale of real property, and he knew from personal experience that to rely on such a document not being so regarded was very dangerous. He even feared that the time was coming when stating the rent or price in particulars to view might be considered a contract, unless such rent or price was stated very cautiously, as Mr. Redman had suggested. As to letting unfurnished houses, Section 75 of the Housing of the Working Classes Act, 1890, provided that anyone letting a dwelling to any member of the working classes must be held to have given an implied warranty that it was fit for habitation.

Mr. Wheeler, Q.C., said he thought it would be an exceedingly useful thing if a committee of lawyers and surveyors could draw up a model lease which would be generally accepted, as was the model building contract drawn up and issued by the R.I.B.A. He agreed that the language of many leases was absurd. He had recently been consulted in a case which turned on the very small matter of whether a damaged kitchen range was to be repaired by the landlord as a "necessary structural repair" or by the tenant. It was not a large matter, but it illustrated the difficulties which arose from vague wording, and he must confess that he felt by no means clear in his own mind which way the matter should go. He considered the question of flats a most interesting one. Flats were merely vertical streets instead of horizontal streets, and the main questions which arose were as to right of ingress and egress, and perhaps as to ownership of the soil and the roof. He quite agreed with the finding of the Courts, that a landlord might not substitute a new staircase in a new position for that which the tenant had been accustomed to use. The distinction between a valuation was a mere shadowy one.

Mr. Sabin mentioned a case where a building being in the course of erection, the freeholder permitted the erection on his adjoining land of buildings which, from their use and nature, so increased the first tenant's risk of fire that his insurance premium rose from some 2s. per cent to 10s. per cent. What was the remedy in such a case?

Mr. C. K. Bedells having given several instances of the difficult points which arose under the terms of leases of urban property, Mr. Warner said he thought Mr. Redman had given a wholesome warning to surveyors, who were sometimes apt to forget the maxim of the shoe-

maker and his last, and to do work in their offices which should be intrusted to a solicitor.

Mr. Redman, in reply, said he quite agreed that that there was an element of danger in reading such a paper as his own, and that no good end was served by trying to make good surveyors bad lawyers; but he had endeavoured to avoid that danger, and only to point out a few of the pitfalls which surveyors must avoid. He knew the difficulty of defining what came under "structural repairs"; he had heard it argued that a burst gaspipe did so. He was afraid that a great deal of litigation arose from the fact that everyone thought he could draw an agreement for a lease, as everyone was satisfied he could make his own will. With regard to the difference between a "trade" and a "business," he thought that the latter would include the occupation of premises by a director, a solicitor, or a surveyor, or anyone who used them for the purposes of gaining his livelihood, or even of endeavouring to do so.

### ART CONGRESS IN LONDON.

BY the conjoint invitation of the Society of Arts and of the Worshipful Companies of Drapers, Fishmongers, Goldsmiths, Merchant Taylors, and Clothworkers, a meeting of the Congrès International de l'Enseignement Technique will be held this year in London, commencing on June 15. The congress was founded in France in 1886, at Bordeaux, held its second meeting at Paris in 1889, and its third at Bordeaux in 1895. The next, or fourth meeting, was originally intended to be held in Spain, but difficulties intervened, and the promoters have decided to hold it in London. The congress will be opened at 11 o'clock on June 15, in the great room of the Society of Arts by an address from the president, the Duke of Devonshire, K.G., followed by one from the president of the last congress, M. le Professeur Léo Saignat. The meetings will be held on Tuesday, Wednesday, Thursday, and Friday, from 11 to 1 and from 3 to 5. The subjects for discussion will include:—Technical education.—1. Advanced instruction—polytechnics, universities, colleges. 2. Secondary instruction—higher technical schools, secondary and intermediate schools, evening schools. Commercial education.—1. Advanced instruction—colleges, high schools, and Institute of Commerce. 2. Secondary instruction—commercial schools, high schools, classes for adults. The education of both sexes will be included, but it is not proposed to deal with elementary education, either technical or commercial. Papers have been promised by Professor Ayrton, Professor Silvanus Thompson, Sir John Donnelly, Mr. Swire Smith, Mr. Gilbert Redgrave, Sir Philip Magnus, Professor Wertheimer, Professor Hewins, Professor Armstrong, and others. Mr. J. A. Baines, C.S.I., and Mr. Bhownaggee, M.P., have promised papers on "Technical Education in India." Mr. H. F. Eaton will read one on "Technical Education in Victoria," and one is expected from Sir William Windleyer on "Technical Education in New South Wales." The proceedings will be reported in English; but papers may be in French, German, or English, and speakers may make use of any of these languages. Sir John Gorst and M. Léo Saignat are the vice-presidents, and the proceedings will be controlled by a committee, with Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., as chairman. Sir Henry Trueman Wood will be general secretary, and from him, at the office of the Society of Arts, in John-street, Adelphi, any desired information about the congress can be obtained. The proceedings will be diversified by a reception at the Mansion House on the evening of June 17, and by the annual conversazione of the Society of Arts on the 16th. On Saturday, June 19, it is proposed to organise an excursion for foreign delegates to some place in the neighbourhood of London.

### THE REGISTRATION OF PLUMBERS' BILL.

THE Bill introduced by Mr. Lees Knowles, Earl Compton, Mr. Dixon, and Dr. Farquharson for the registration of plumbers was considered on Monday by the Standing Committee on Trade. It is a measure whose provisions place on record the names and addresses of persons qualified to follow the occupation of plumbing. Mr. Tomlinson proposed that three provisional councils should be the governing authority of the



body, including the masterplumbers and builders; but Mr. John E. Ellis, the chairman, said the amendment was out of order, and consequently it was formally negatived. An amendment to Clause 3, increasing the representative character of the board, was similarly disposed of.

Mr. Lees Knowles pointed out to the committee that in the clause comprising a "general council" of 67 members for the whole United Kingdom, it was intended that an elective and representative body should be meant. The necessities of each case and in every part of the kingdom would be provided for.

Mr. T. W. Russell (Under-Secretary for the Local Government Board) said it would be against the idea of his department to set up an authority representative of every locality.

Upon the motion of Mr. T. W. Russell, the committee agreed to the undermentioned "time" clause:—"The members of the general council shall be elected to hold office for a term of 'five' years, and shall be eligible for reappointment, and any member may at any time resign appointment, by letter, addressed to the said council, and upon the death or resignation of any member of the said council some other person shall be appointed a member of the said council in his place, as in this Act provided."

Mr. Whittaker moved that the fee for examination and registration should be a guinea for the first year, and five shillings a year afterwards. He made this proposal so that extortionate charges should not be made, and that the lowliest workmen should get under the benefit of the Act. The Bill, as it stood, would not prevent any employer from taking into his employment persons who were not upon the register.

The committee adopted also a clause under which the general council may direct that a name be removed from the register which has been incorrectly or fraudulently entered, or the name of any plumber convicted of crime, or guilty of "disgraceful conduct."

At this juncture the committee suspended their sitting to yesterday (Thursday).

#### EXTRAS ON LONDON BOARD SCHOOLS.

AT the last meeting of the London School Board, considerable discussion took place upon a report of the works committee recommending the acceptance of certain tenders for school buildings. In one case the tender amounted to £23,337 for the erection of a school in Hackney Wick, the buildings to include, besides the ordinary school, rooms for special instruction, a laundry centre, and a cookery centre, and to accommodate 927 children. The committee proposed, in order to bring the total cost of the work within the amounts allowed by the Education Department, to include in the application for a loan a provision of £100 for possible extras on the contract, instead of the usual provision of 5 per cent. on the contract amount. In another case the committee proposed to omit in the application to the Department for a loan the usual provision of 5 per cent. on the contract amount for extras in order to bring the total cost of the work within the amounts allowed by the Education Department.

Amendments were moved, referring back the report to the works committee, with instructions to add the usual 5 per cent. for extras, and several Moderate members commented severely upon the action of the committee in making estimates which would not enable the Education Department to judge as to the real cost of the buildings. The extras, it was contended, were struck off to bring the total cost within a certain sum, so that the Department would be induced to grant a loan, and the fact was not sufficiently disclosed that the extras, notwithstanding, would have to be incurred. In this way it was urged that the Department and the Board were deceived, because the real cost of the schools was not properly set forth.

General Moberly (chairman of the works committee) protested strongly against the unfair treatment to which the committee had been subjected.

Mr. Davies objected to the proposal of the works committee on the ground that it involved a departure from the usual practice of the Board for a specific purpose—namely, to mislead the Education Department. The rule of the Education Department was that no buildings should exceed a cost of £10 per child, and in order to enforce this rule the Department refused to make a loan

for any building which exceeded that amount per head. The experience of the Board had led them, in making their estimates, to add thereto a sum of 5 per cent. for unforeseen extras, and while this 5 per cent. was often found to be insufficient, it was seldom or never found to be excessive. In one of the cases under consideration the estimate to be presented to the Department was for the bare tender, and the usual 5 per cent. was omitted. When they looked for a reason the committee stated that they had taken this course "in order to bring the total estimate for the work within the amounts allowed by the Education Department." But it was as certain that extras would be incurred in this case as in all others, and to omit the usual provision for them from the estimate in order to induce the Education Department to make a loan which they would refuse under their own rule were the full estimate furnished was, he did not hesitate to say, a dishonest method of procedure.

The Progressive members supported the committee's report, and the amendments were rejected; but in a further case of a similar character an amendment, moved by Mr. Diggle, was accepted, agreeing to inform the Education Department that only £50 instead of 5 per cent was included in the estimate for extras.

#### THE MOSAIC DECORATIONS AT ST. PAUL'S.

PROFESSOR W. B. RICHMOND, R.A., gave an address on "The Mosaic Decorations of St. Paul's Cathedral," on Saturday, in the galleries of the Royal Society of British Artists. The chair was taken by Mr. Wyke Bayliss (president of the society), and there was a large attendance. Professor Richmond exhibited a number of full-sized cartoons and smaller drawings to show the *modus operandi* of his work. He remarked that by this time his experience had become very considerable in a difficult and beautiful art, and the longer he studied that art the more enchanting he found its possibilities and the more ennobling its limitations and restrictions. The decoration of the choir of the cathedral had been finished, and he was now engaged on another part of the building, which he hoped would be completed some time this year. When the Dean and Chapter desired him to submit designs for the decoration of the choir, he was fully determined on certain points. These were first, that the only material for such decoration was mosaic, because it could be washed without injury, an absolutely necessary precaution under the condition of London's smoke-laden atmosphere. However delightful might be the methods of fresco and tempera painting in the clear air of Italy, or even in country places in England, while the atmosphere of London continued to be charged with every destructive acid, they were out of the question for St. Paul's. Against pictorial mosaic he resolved to set his face, and to adhere to the principles of design and execution which prevailed in Italy, Greece, and Asia Minor during the Classical times of the Byzantine Empire. And while adhering in principle to severe methods of design and simplicity of colouring, and making use of the modern spirit of antiquarian research, he decided to follow the precepts of the great masters by being accurate in drawing, and, according to his lights, noble in his choice of form. But perhaps his most important point was that our Metropolitan church must be decorated by English and not by Italian labour. On this point, quite leaving out of consideration any estimate of the qualities of his design, it might in fairness be said that the mosaic work in St. Paul's, laid by English workmen, the materials for it made in England, proved that, however rash it might have appeared to be at first sight to employ them, there need be nothing but congratulation as regarded the choice.

#### HYDRAULIC CEMENT: ITS PROPERTIES, TESTING, AND USE.\*

A GREAT many treatises and handbooks have been lately published on this subject; but there are hardly two that will be found to agree in the chief points. The results of experiments show a lamentable divergence, and every author has his own opinions to ventilate.

\* By FREDERICK P. SPALDING, Assist. Professor of Civil Engineering at Cornell University, &c. First Edition. London: Chapman and Hall, Ltd.

Professor Spalding's little volume gives a fair résumé of the results of experiments and of the methods used for testing cement. The author brings a wide knowledge, derived from his own laboratory observations and from the results of various experimentalists, as well as the recommendations of recent commissions, and the requirements of specifications have been considered. Practical value is given to the work by the sample specifications appended, showing the practice of leading American engineers. In the chapter on Classification and Constitution of Cement, the author concisely defines the properties of Portland cement as follows: "The action of Portland cement seems to depend upon the formation, during the burning, of certain silicates and aluminates of lime, which constitute the active elements of the cement, the other ingredients being considered in the light of impurities. The ideal cement would be that in which the proportion of lime is just sufficient to combine with all the silica and alumina in the formation of active material. If there be a surplus of clay beyond this point, it forms inert material. Any surplus of lime remains in the cement as free lime, and constitutes one of the chief dangers in the use of cement, as it may cause the cement to afterwards swell and become cracked and distorted as the lime slakes." On this theory, it is better that the clay be somewhat in excess, in order that free lime be not formed. Valuable tables of the composition of this cement are given, and the table from Candlot showing the constituent parts in French, English, German, and Belgian cements is well worth study. Professor Le Chatelier, from a careful analysis of Portland cement made from clinker, concludes that "the tricalcic silicate,  $\text{SiO}_2\text{Ca}_2$ , is the only compound that is really hydraulic, and is the active element in this cement 'occurring in cubical crystals.'" The methods of testing cement and the chapter on the tests of the strength of mortar, illustrated by various testing machines and clips, will be found of value. These tests are all fully described. Although some authorities question the value of a fineness test, there is no doubt of the value of this quality, as the impalpable powder seems to be the valuable part of the cement. One specification for municipal work in St. Louis, Mo., provides: "All cement shall be fine-ground, and 85 per cent. shall readily pass a sieve having 10,000 meshes to the square inch, and to be capable of withstanding a tensile stress of 400lb. per square inch when mixed neat and exposed 24 hours in air and six days under water." Most specifications only require a single sieve, generally one of 2,500 meshes; but the author says a more general use of the fine sieve of 10,000 meshes would be advantageous, as it is admitted by many that "all material coarser is practically inert, and a real measure of useful fineness is not given by the 2,500-mesh sieve." The book will be found generally useful both for students and practical cement users. The tests and specification standards add a practical value to the work.

#### THE AUCTIONEERS' INSTITUTE.

THE annual meeting of the Auctioneers' Institute of the United Kingdom will be held to-day (Friday) at 2.30 p.m., in the lecture-hall of the Institute, 57 and 58, Chancery-lane, W.C. The report of the council is of a highly satisfactory character. During the year 105 applications for membership were received, and of these there were elected—as Honorary Fellow, 1; as Fellows, 46; as Associates, 38; as students, 12; making a total of 97 new members. Nine of the Associates and nine of the students qualified for membership by examination. Twenty-seven names have been taken from the register by reason of death, resignation, and from other causes. The income, including the balance brought forward from last year, amounted to £1,608 4s. 7d., and the expenditure was £1,330 9s. 10d., leaving a cash balance to be carried forward to the next year of £277 14s. 9d. The balance to the credit of the revenue account is £536 4s. 4d., so that the Institute is in a sound financial position. The expenditure during the year has been heavier than usual, owing to law costs (incurred in the action which the council felt bound to take for the protection of the Institute); for the necessary outlay for furnishing the new lecture-hall, and for the increased cost of printing and circulating the papers read before the Institute.



Six ordinary meetings have been held, at which papers were read:—"Valuations and Appraisements," by Mr. A. J. Ram, Recorder of Hanley; "Auctions, their Use and Abuse," by Mr. J. F. Field; "Some Recent Rating Decisions," by Mr. F. Marshall, Q.C., LL.B.; "The Practice of Compensations," by Professor Banister Fletcher; and "The Law of Fixtures in Practice," by Mr. John Hepper. All the lectures were well attended, and were followed by interesting discussions.

The examinations of the Institute are now being earnestly taken up by students, and must result in great benefit to the profession and the public. In April, 1896, 23 candidates presented themselves for examination, and of these 18 satisfied the examiners. The increased number of entries, and the general excellence of the work done, prove that the examinations are being taken up with earnestness of purpose. The council has decided that the library shall be increased, and become a lending library, so as to be of real value to the members.

The serious attention of the council has been given to the present unsatisfactory method of the Inland Revenue authorities of receiving "estimates" of value for probate and estate duty purposes given by persons not competent to value. They have pointed out to the Board of Inland Revenue that in their opinion a considerable loss of duty is sustained, and, although the Board still holds to the objectionable practice, it is hoped that a change may at no distant date be brought about. The council have resolved to persist in their efforts until this change is effected. They have also, through the president, been in correspondence with the School Board for London in reference to its departure from the recognised rules of negotiating and settling claims for compensation in respect of property required for its purposes: the correspondence is not yet closed, but will be published in due course.

The annual dinner of the Institute will be held this evening at the Hotel Cecil, Strand. The president, Mr. James F. Field, of London, will occupy the chair.

#### CHIPS.

Mr. John Street, for many years clerk of works at H.M. War Office, died on Friday last at his residence, 19, Kersley-street, Battersea Park-road, in his 61st year.

This is probably the last year that outsiders will be permitted to contribute to the Royal Academy Exhibition to the extent that has hitherto prevailed. In 1868 about 5,000 exhibits were thus offered, 5,000 in 1872, and 9,000 in 1885. This year about 1,300 were sent in, including water-colours, architectural drawings, miniatures, and sculpture. There is room on the walls for about 1,800 numbers, and of these under 200 come from R.A.'s and A.R.A.'s.

The board schools at Stanton Drew, Somerset, have just been reopened after enlargement and alterations. The works have been carried out by Messrs. Field and Son, from plans by Mr. G. Ace, Beynon.

The death took place at his residence, Canmore Park, on the 6th inst., of Mr. James Cargill, builder. Deceased was a native of Forfar, and for about 30 years carried on an extensive business as a builder. He was upwards of 60 years of age, and leaves a widow and grown-up family.

The Hutton Infirmary, Banbury, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. Rienzi Walton, M.L.C.E., Local Government Board inspector, has held an inquiry into the application of the Basford Rural District Council for sanction to borrow £7,250 for works of sewerage and sewage disposal for the parish of Selston.

The Art Gallery Committee of the Manchester Corporation have decided that the two large pictures, "Captive Andromache," by Sir Frederic Leighton, P.R.A., and "Ulysses and the Sirens," by William Etty, R.A., be not in future lent on any conditions whatever.

The Bishop of London presided on Saturday evening at the dinner of the Artists' General Benevolent Institution, and, in proposing the chief toast, alluded to the increasing difficulty of foretelling what might hit the public taste. The artist's life, he said, was beset with pitfalls, into which many fell, and it was the object of this institution to help those who were thus in need. Sir E. J. Poynter replied to the toast of "The Royal Academy," remarking on the interest which the late Lord Leighton and the late Sir J. Millais took in this institution.

#### OBITUARY.

MR. GEORGE GILBERT SCOTT, M.A., F.S.A., who died on Thursday in last week from dropsy at the age of 57 years, was one from whom great things were anticipated a generation since. The eldest son of the well-known leader of the Gothic Revival, and of his wife, Charlotte Oldrid, he was born in 1839 at 31, Spring-gardens, S.W., the comfortable 18th-century brick house in which Sir Gilbert carried on his extensive practice from his marriage till his decease in April, 1878. G. G. Scott the younger was educated at Eton, and passed thence into Jesus College, Cambridge, where he took his degree, and carried off the Burney prize. He was appointed almost immediately afterwards one of the examiners in moral science at the Tripos, and at an early age was elected a Fellow of his college. After matriculating, he assisted his father and brother, John Oldrid, in their practice, afterwards taking an office in Cecil-street, Strand. Bearing a distinguished name, and showing marked originality in his designs, most of which were conceived in a Late type of Gothic, commissions flowed in freely, and he carried out works in many parts of the South of England. Some of his best-known buildings are the Church of St. Agnes, Kennington Park, illustrated by us on July 16, 1875; a church at Pevensey; additions to Pembroke College, Cambridge (where Mr. A. Waterhouse, R.A., had already carried out new buildings); the Cathedral Church of St. John, Newfoundland (since burnt down and rebuilt from his drawings, under the direction of the original clerk of works); and the great Roman Catholic Church of St. John the Baptist, on St. Giles' Hill, Norwich, which is being continued under Mr. J. O. Scott. Soon after he commenced practice, his office in Cecil-street was burnt out, and all his drawings, prizes, and books were destroyed—a great blow to him—and he then continued practice at his own house at Hampstead, taking an office near Portland-road. Among his pupils were Mr. W. S. Weatherly, of Cockspur-street, Mr. Temple Moore, now of Hampstead, and Mr. Thackeray Turner, who became his chief assistant, and is now more widely known as the energetic secretary of the Society for the Protection of Ancient Buildings. He wielded a facile pen as a draughtsman, and also wrote clearly and succinctly. Within a year of his father's death he edited with much tact and ability Sir Gilbert's "Personal and Professional Recollections," published in two volumes, and he also wrote a scholarly work on Architecture, which excited some interest at the time. Soon after his father's death, Mr. Scott astonished his friends by professing the Roman Catholic faith. The routine and discipline of an architect's office were never to Mr. Scott's taste, and being possessed of ample private means, he gradually withdrew from practice, and his works have been finished by his brother, his name being added as consulting architect. Other causes were soon apparent for his retirement. In the summer of 1883 his conduct became so erratic that his friends thought it necessary to put him under restraint, and in the spring of the following year a protracted inquiry under the Lunacy Acts took place before the late Mr. Justice Denman and a jury, which resulted in a certificate being granted by the judge that Mr. Scott was of unsound mind, and incapable of managing himself or his affairs. The decision was appealed against, but was confirmed. He married, in 1872, Miss Sampson, of Eastbourne, who, together with their son now at Eton, survives him. The funeral took place at Hampstead Cemetery, after a requiem service in St. Mary's Roman Catholic Church at Hampstead, on Tuesday, and was attended by his widow and family, his brothers, Mr. J. O. and Dr. Dukinfield Scott, Canon Scott, and other relatives, Mr. C. R. Baker King and other members of Mr. J. O. Scott's staff, Messrs. Weatherly, Temple Moore, Canon Duckett (who has practically acted as clerk of works on St. John's Church, Norwich), and other old friends.

We also regret to announce the death of an old contributor, Mr. GEORGE THOMAS ROBINSON, F.S.A., the well-known architect, decorative artist, and authority on stucco-duro and plaster-work. Mr. Robinson, who was in his 69th year, died on Thursday in last week at his residence, 20, Earl's-terrace, Kensington, in the 69th year of his age, and was buried at the cemetery at Hanwell on Tuesday. Mr. G. T. Robinson, whose portrait and biography were given in the BUILDING NEWS for April 25, 1890, was a pupil

of Messrs. Hamilton and Medland, of Gloucester, and commenced practice for himself in 1848. Among the public works carried out by him were the town hall of Burslem, the market halls of Tunstall, Bolton, Wolverhampton, and Monte Video, the exchange at Wolverhampton. He was also in his earlier years of practice largely engaged in the erection of new and the restoration of old churches in the West Midlands. For some years he was in partnership with his former fellow-pupil, the late Mr. H. J. Paull (afterwards of the firm of Bickerdyke and Paull, of Chancery-lane), at St. Peter's-square, Manchester. Mr. Robinson was one of the early followers of A. Welby Pugin in striving to raise the character of design in industrial art, and occupied himself largely in designing paperhangings, textile fabrics, metal-work, furniture, and ceramics. He left Manchester for London near a quarter of a century ago, and resigned his Fellowship of the R.I.B.A., and first became for a while manager to Messrs. Burke and Co., the marble workers, and afterwards entered the service of Messrs. Trollope, devoting himself, from that time, entirely to designing and carrying out various branches of decorative art. Among his larger works may be mentioned those for Earl Brownlow at Belton, his seat, near Grantham. Of late years, Mr. Robinson executed much of the internal decoration of the principal Atlantic liners, and also gave attention to plasterwork. He wrote many critical and historical essays in our columns and elsewhere, and recently contributed an introduction to Mr. William Millar's book on "Plasterwork," reviewed by us on the 23rd ult., when we illustrated two of Mr. Robinson's designs in sgraffito. At one time he was connected with the staff of the *Manchester Guardian*, whose war correspondent he was during the Franco-Prussian war, and wrote a graphic description of the siege of Metz, he being the only English press correspondent who succeeded in remaining in the beleaguered city when the others were expelled. Among other works he wrote may be mentioned his "Military Architecture of the Middle Ages," chiefly based on the castles of Warwick, Kenilworth, and Maxstoke; and "Picturesque Antiquities of Gloucestershire."

ONE of the oldest members of the profession has just passed away in the person of Mr. JOHN JENKINS COLE, F.S.A., F.R.A.S., the architect of the new Stock Exchange, who died on Monday last at Maryland, Sutton, Surrey, aged 82 years. Mr. Cole, who formerly carried on practice in New-court, Throgmorton-street, E.C., had an extensive connection in the City, and also designed many country mansions, and additions and alterations thereto, including works at Amesbury Abbey and Hyde Park Corner for Sir E. Anstobus, at Kirtlington Park for Sir Henry Dashwood, at Bletchington Park for Viscount Valentia, at Queen's Gate for the Earl of Munster. He also built St. Mary's Church, Abberley, Worcestershire. Among his later City buildings may be named the premises of the British Equitable Assurance Co. at the corner of the Poultry and Princes-street, which exhibits much refined detail. Mr. Cole joined the Royal Institute of British Architects as a Fellow so far back as 1848, about the same time as Mr. Penrose became a Fellow, but retired from its ranks a few years since.

A stone reredos with marble or alabaster enrichments has just been erected in St. Mark's Church, Bath, to the design of Mr. S. J. G. Stone, architect, of 13, Orange-grove, Bath. The reredos has been carried out at Messrs. Jones and Willis's works, Hornsey.

The Great Western directors are considering the idea of an alternative route between Exeter and Plymouth, by which the gradient difficulty may be overcome, and a saving of six miles effected. From Exeter to Plymouth the distance by the Great Western is 52½ miles, with a ruling gradient of 1 in 42, whereas by the Exeter and Teign Valley Railway (now in course of construction), with proposed railways from Heathfield Junction to Ashburton and from Buckfastleigh to a point just east of the Brent Tunnel, on the Great Western, the distance will be only 46½ miles, with a ruling gradient of 1 in 53.

Apropos of Americanisms and the phrase "to rail" in the sense of to travel by rail, a good story (says the *Westminster Gazette*) is told of Lord Grimthorpe, who lately excused himself from attending a committee on the ground that at his age he could not "indulge in unnecessary railing." Those who are familiar with the noble lord's epistolary style in the columns of the *Times* and elsewhere will appreciate the joke.



## Building Intelligence.

**ABERDEEN.**—At the last meeting of the Plans Committee of the Town Council plans were submitted for approval of 21 new buildings and extensions in various parts of the city, the total estimated value of the new buildings being £41,450—the largest amount represented by any batch of plans ever before the committee. The new buildings, to be erected by Messrs. Sangster and Henderson, will be the highest business premises in Union-street, being seven stories, including the basement. The front elevation, to Union-street, will have two sets of oriel windows that run up the front from the second-floor level. The new block will occupy the entire feu, with frontage to Union-street, St. Catherine's Wynd, and Netherkirkgate. The premises will be occupied as saloons, warerooms, and workrooms, though certain of the upper floors will be let. The various floors will be connected with a lift. Mr. Robert G. Wilson is architect for the buildings. Messrs. Bruce, Edwards, and Milne's new buildings will occupy a site at the foot of Bridge-street where the old houses stand, known as White's-square. Including the basement, the buildings will be five stories high. At the ground level, in Bridge-street, a large gateway in the middle of the elevation will give access to a courtyard in the interior. On each side of this central entrance will be two shops, and the main buildings will be used as warehouses. The conformation of the site necessitates some heavy excavations—over 40ft. at the back. Messrs. Harper and Sutherland are the architects. Extensions are also to be made to St. John's Church. To the present building, which is seated for only 250, will be built a choir vestry and a north aisle, holding 80 additional sittings, while to the church will be added a spire. The total extensions will cost about £1,500. The whole height of the tower and spire together when completed will be about 110ft. The tower is built at present to about 35ft. Mr. Arthur Clyne is architect for the extensions.

**BALDOCK, HERTS.**—The foundation-stone of the new town hall was laid last week. It occupies the angle of High-street and Hitchin-street, a site cleared by a recent fire, and generously presented by the owners to the urban district council. The council chamber will be on the second floor at the south end next the High-street, with the clerk's office and the surveyor's office at the back. The centre of the ground-floor is given up to the fire-brigade. At the north end the ground-floor is taken up by the caretaker's residence. The upper part of the building will be used as a public hall, which, with a narrow gallery at the south end, will seat 350 persons. A tower, some 60ft. high, will be a feature of the front. Messrs. Redhouse and Sons, of Stotfold, are the contractors.

**BURNLEY.**—The church of St. Catherine, in Todmorden-road, was consecrated by the Bishop of Manchester on the 4th inst. The total cost has been about £8,143, and the architect is Mr. Medland Taylor, of Manchester. The church is built with a nave of seven bays, with a small transept towards the easterly end of the south side, and an organ chamber projecting slightly towards the north. In the centre, towards the east end, is the lofty sanctuary arch, which opens on to a polygonal sanctuary, the windows of which are high up above the roofs of the adjoining vestries. The nave has the unusually wide span of 51ft., and there are no aisles, but projecting towards the west from the sanctuary is a raised platform for the choir. This is three steps above the floor of the nave, and separated from it by a low wall and a wooden screen. Both the pulpit and the lectern form a part of this design, and there are the customary stalls for the choir and clergy. There are nine steps up to the Lord's Table, which, like that for the morning celebrations in the chapel adjoining, is of carved Dantsic oak. The western gallery accommodates about 90 persons, and is entirely over the west-end porches and the baptistery. The nave is seated with open benches, and the total accommodation for adults is 673. At the north-west corner is a porch and a door, while above it is a turret capable of containing three bells. The inside of the church is lined chiefly with red brick, relieved with buff and stone, and no plaster-work will interfere with the general effect. The roof is unstained, and of red wood, and the style is Perpendicular. Rising from one of the

beams in the central part of the building is a large cross of wrought iron, and over the Lord's Table a baldacchino of wrought iron. The masonry contract was executed by Messrs. Smith Bros.; joinery, Messrs. Clegg Bros.; slating, Mr. O. Whittaker; plumbing, Messrs. Waterson and Hargreaves; stained glass, Messrs. Edmundson, of Manchester; ironwork, Mr. Jones; and the baldacchino supplied by Mr. Wragge, of Manchester.

**BURY, LANCs.**—On Saturday the finishing touches were put to one portion of the Bury Corporation Sewage Disposal Works, the top stones of the chimney connected with the destructor and sludge-pressing machinery being placed in position by Mr. Alderman C. Brierley (chairman of the Bury Sewage Committee) and Miss Dennis (daughter of the contractor for the chimney, Mr. C. Dennis, of Bury). The chimney will rank amongst the loftiest structures of the kind in the country. It measures 300ft. in height from the ground-line, the diameter at the bottom being 28ft. 6in., and at the top 10ft. 4in. The foundation covers an area 41sq.ft., and is 18ft. below the ground-line. The total weight of the structure, including the cast-iron cap and terracotta top, is 5,000 tons, which gives a pressure of 5,631lb. to each square foot of the foundation. About 200,000 bricks were used in the foundation, and 800,000 bricks in the whole structure. The cost has been about £3,000.

**EDINBURGH.**—The first of the public branch libraries to be erected by the Nelson Trustees in connection with the public library committee was opened by Lord Rosebery on Monday. The site of this building, which will be called the Nelson Hall and West Branch Library, is at the corner of Murdoch-terrace and Dundee-street, and opposite the newsbureau from Orwell-terrace. The exterior is of red freestone and Hailes, and the main feature of the front is the doorway, with double pilasters on each side, having carved capitals and carved frieze. Under the terms of the bequest of the late Mr. Thomas Nelson, the trustees have restricted the halls to one story in height, so as to admit of their being well-lighted from the roof. The Nelson Hall occupies the whole of the west side of the building, and will be used as a news-room and recreation-room. It measures 75ft. by 33ft., and is 37ft. high, and has an open-timbered roof. The library is in the centre of the building, with a counter to the entrance hall for general borrowers, fitted up with indicators. Bookcases for 12,000 volumes have been provided. The library is separated from the Nelson Hall by a series of arches, glazed with leaded glass, and from the reading-room by a counter only. The upper floor consists of staff workroom, committee-room, and a hall for small meetings. Above this is the caretaker's house. The whole building is heated with radiators and hot-water pipes, and ventilated by air shafts, opening through the radiators, so that the air is heated on its way into the halls, and electric motor fans are placed on the roofs for extracting the vitiated air. The whole floors are laid with linoleum. Mr. Harry R. Taylor, of Messrs. Lessels and Taylor, George-street, Edinburgh, is the architect.

**NEWCASTLE-ON-TYNE.**—A conference took place last week at the Newcastle Workhouse between Mr. Percival Gordon Smith, architect to the Local Government Board, Mr. Dawson, Local Government Board inspector for the district, and a special committee of the Newcastle Board of Guardians who were recently appointed to consider the advisability of remodelling and enlarging the workhouse. Plans which had been prepared by Mr. Dunn, the architect to the guardians, and which showed suggested improvements of the workhouse buildings, were exhibited. Mr. Gordon Smith stated that he had gone carefully over the workhouse, and was surprised that the guardians had been able to carry on their work as efficiently as they had, taking into consideration the obsolete buildings. They ought at once to consider whether it was not advisable to go to a new site. He had no hesitation in saying that sooner or later the children must go from the workhouse. If that were done the present school buildings could be used for chronic patients and other inmates, and thus save a large expenditure in bricks and mortar. Considering the growth of Newcastle, they ought at least to provide for 2,000 people, and they should not begin to patch here and there, but begin a system and develop it. They should have a hospital with 500 or 600 beds, instead of 270, as at present. A discussion

followed, and the following questions were submitted to the committee, who will ask the guardians to reply to them:—(1) Should the guardians take the children from the workhouse? (2) Is it best to extend the present workhouse and infirmary? (3) Whether it is not best to take the workhouse altogether from its present site to some other site in the city?

**ST. ANDREW'S, N.B.**—The plans of the new medical building to be erected by the University Court were passed by the Burgh Commissioners on Monday. The building provides accommodation for the departments of *matéria medica*, practical physiology, botany, and anatomy. Each department consists of a laboratory, lecturers' room, and museum. In the front block there are also cloakrooms for the students, lecturers' common room, and a room for the janitor. The anatomical section occupies the most of the back block, and comprises a lecture theatre, a large practical anatomy room, a preparation room, cellars, and a lift to the preparation room. The building is to cost about £10,000, and the funds are being provided by the Marquis of Bute. The architect is Mr. James Gillespie, Queen-street, St. Andrew's.

### CHIPS.

Owing to a clerical error Mr. Arthur R. G. Fenning's name was omitted from the catalogue of Architectural Illustrations now in the Academy as being joint architect with Mr. W. H. Seth-Smith of the design for the new Presbyterian College at Cambridge.

The foundation-stone of the new aisle at St. Paul's Church, Derby, was laid on the 7th inst. by Lady Haslam. The aisle is to be built by Messrs. Parker and Son, of Friar Gate, the architect being Mr. Percy Currey. It will cost £800, and will provide seating accommodation for 100 people.

The Queen will formally open on Friday in next week, the 21st inst., the new town hall at Sheffield. It has been built from plans by Mr. E. Mountford, selected in competition seven years ago, Mr. A. Waterhouse, R.A., being the assessor, and was illustrated in the *BUILDING NEWS* for June 27, 1890.

The National Trust for Places of Historic Interest or National Beauty recently appealed for funds to enable them to secure to the nation for ever the headland at Tintagel, known as Barras Head, and which overlooks the ruins of King Arthur's Castle. That appeal has been readily and liberally responded to, and a balance-sheet just issued by the Trust shows that, after completing the purchase and defraying all expenses connected therewith, they have a balance in hand of £8 13s. 9d., a portion of which will be expended on a dedication stone. The donations received totalled £545, and of this £505 was paid for the land to the Earl of Wharncliffe, who had intended letting it for building purposes.

The Patent Office Extension Bill came before a second committee of the House of Commons, presided over by Mr. Akers-Douglas, First Commissioner of Works, on Friday. There was no opposition to the measure. It was passed through committee, and ordered to be reported to the House.

The Theatre Royal, South Shields, is about to be reconstructed, and will be reseated and redecorated. Mr. J. H. Morton, of King-street, South Shields, is the architect.

At a general assembly of the Royal Society of British Artists, held on Friday, the following gentlemen were elected members of the Society, viz.—Messrs. Hubert Coop, Cecil Aldin, Enoch Ward, S. Grant Rowe, James Townshend, and C. F. Lowcock.

Mr. H. W. Pollard, builder (and ex-Mayor), of Bridgwater, has nearly completed, at a cost of about £9,000, the erection at Yeovil of the church of St. Michael and All Angels, which will be dedicated and opened on June 14th next. The church is built of Ham stone, in the 15th-century style of architecture.

At Brynmaen, an outlying upland district of Colwyn Bay, Mrs. Eleanor Frost, widow of the late Mr. Charles Frost, Minydon (a former high sheriff of Carnarvonshire), laid, on Tuesday week, the foundation-stone of the new church she is building close to the tomb where her husband's remains were interred on May 4, 1896. Mrs. Frost is not only erecting the church as a memorial, at an outlay of £7,000, but she is also providing £200 annual endowment, and a vicarage house for the new ecclesiastical parish.

The Princess Christian inspected, on Friday, at the Crystal Palace, a new statue of her Majesty—a replica executed by Mr. G. von Perch of the statue by the late Mr. C. B. Birch, A.E.A., on the Victoria Embankment.



## Engineering Notes.

**THE PROPOSED WATFORD, EDGWARE, AND LONDON RAILWAY.**—A select committee of the House of Commons has passed the Bill incorporating a company with powers to construct a railway seven miles in length, commencing by a junction with the London and North-Western Railway at Watford and terminating by a junction with the Great Northern Railway at Edgware, with a connecting line to the Midland Railway at Mill Hill. The estimated cost of constructing this railway is £219,193. The capital of the company is fixed at £240,000, with borrowing powers not exceeding £80,000.

### CHIPS.

On Saturday, a subscription portrait of the Master of Peterhouse, the Rev. James Porter, D.D., painted by Mr. W. W. Oulless, R.A., was formally presented to the college as a mark of appreciation of the services Dr. Porter has rendered the University and town of Cambridge.

The Board of Trade has approved of and issued a provisional order for the enlargement of the pier at Clacton-on-Sea. The undertaking covered by this provisional order is the lengthening of the pier to such an extent that four large steamers will be enabled to lie alongside at one time.

The city council of Liverpool having applied to the Local Government Board for sanction to borrow £8,000 for the purpose of laying-out the Kirkdale gaol site as public walks and pleasure grounds, a Government inspector held an inquiry at the municipal offices yesterday (Thursday). It was stated that the city council have accepted the tender of Messrs. Lawrence Marr and Sons, of Lodge-lane, Liverpool, at £7,150, for laying-out the grounds.

On Saturday a movement involving the expenditure of £2,000 for the improvement of chapel and school accommodation was commenced at Marsden. The scheme provides for the addition of 130 sittings to the chapel, an organ recess, minister's vestry, choir vestries, lavatories, and increased school accommodation. The work is being carried out under the superintendence of Messrs. John Kirk and Sons, architects, Huddersfield and Dewsbury.

The present year being the 400th anniversary of the discovery of North America, the citizens of Bristol have resolved to commemorate the event by erecting a memorial to John Cabot and his colleagues. It will take the form of a tower, designed by Mr. W. V. Gough, architect, and will be placed on the summit of Brandon Hill. The foundation-stone will be laid on June 24, the anniversary of the day on which the mainland of North America was first seen by a European navigator.

The foundation stone of St. Teresa's new church, at Birkdale, has been laid by the Roman Catholic Bishop of Liverpool. The church will be of Gothic design, with Yorkshire parpoint base, red stone dressings, and Burnley pressed bricks. The plan is cruciform, its length 103ft., and its width across transepts will be about 92ft., and when furnished the church will seat 600 persons. Messrs. Sinnott, Sinnott, and Powell, Harrington-street, Liverpool, are the architects, and Messrs. Fairbridge and Hatch, Birkdale, the contractors.

The Assessment Committee of the Pontefract Union have had again to appoint a valuer to the union, their last choice, Mr. Jos. Smith, of Bradford, having died a short time after his appointment six weeks ago. There were twelve candidates, and the final vote lay between Mr. Frank Gott, of Leeds, and Mr. Wheeler Smith, of Bradford. The latter was selected.

The Canadian Government intend to begin immediately the works for enlarging and deepening the canal system in the Dominion, securing a uniform depth of 14ft. from Lake Superior to Montreal, at an estimated cost of two millions sterling.

A special meeting of the Melton Mowbray Urban District Council has been held to receive the report of a committee relative to the duties and salary of the surveyor. Statements had been made to the effect that the surveyor has received about £1,000 a year, and a return was now presented showing that the total amount paid to him for the past ten years was 1,935 5s. 1d., giving an average of less than £200 a year, including extras. His stated salary was £110, the remainder being for extras. After discussion, it was decided that Mr. Jeeves be offered the sum of £200 per annum as surveyor to the council, to include all extras.

The arrangements for the unveiling of the Scott memorial in Westminster Abbey are now practically completed. The bust, a copy of Sir Francis Chantrey's well-known portrait, by Mr. Hutchison, R.S.A., of Edinburgh, will be unveiled by the Duke of Buccleuch on Friday in next week, the 21st inst., at 1.45.

### COMPETITIONS.

**FELIXSTOWE.**—The Spa and Winter Garden Co. recently invited architects' drawings and estimates for laying out about 800ft. of the cliffs and grounds beneath the present public gardens at Felixstowe, for the building of a pavilion or other erection available for concerts or winter gardens, with reading and refreshment rooms, and lavatories and cloak-rooms, and with or without bath, club, and billiard-rooms. The cost was not to exceed £15,000, and a premium of £50 was offered for the drawing placed first in the order of merit, and £15 for the drawing placed second. The committee has been advised by Mr. E. C. Frere, A.R.I.B.A., of Lincoln's Inn-fields, W.C., and upon his report have awarded, out of eight competitors, the first premium to Mr. Brightwen Binyon, of Ipswich, and the second to Mr. George William Leighton, of Ipswich and Felixstowe, and arrangements are being made to carry out the work. Mr. Binyon's plan, which is illustrated by a water-colour perspective, provides for a central building, containing billiard, refreshment, and cloakrooms over which is a concert-hall or winter garden, 86ft. by 55ft., with reading, smoking, and dining-rooms, facing the sea, and opening on to a promenade along the front of the site, under which is arranged beach-houses, that could take the place of the present unsightly bathing-huts. The concert-hall is lighted principally from the top by a glass pavilion roof, having a promenade round, with a bandstand and wind shelters to the front. The buildings and grounds are entered from the beach in the centre, and also from the cliff gardens. The grounds have been divided into three, and the building so arranged that it can be carried out in sections:—The first, the centre portion, containing the concert hall and beach-huts; the second, the portion to the west of the existing zigzag steps and path, containing the spa and baths, and also a continuation of the promenade; and the third portion consisting of a continuation of the promenade to the east, as far as the end of the site. The design has been arranged with the view to the subsequent building of a pier, starting from the level of the promenade at the centre of the range of buildings, and the grounds are laid out with paths and tennis courts, with summer huts and seats at convenient places. Mr. Leighton's design shows a perspective winter garden and concert pavilion, the latter being 80ft. by 52ft., placed in the centre of the main building. It is in the shape of an irregular octagon, with long sides, and there is a deep orchestra on one side. Cloakrooms, lavatories, dressing-rooms, billiard, card, reading, ladies' refreshment and pump rooms are all provided, and the flat roofs form a promenade, with bandstands or kiosks. A classic treatment is adopted in this design. Both designs show buildings of red brick and stone. All the eight sets of drawings are being exhibited at Felixstowe to-day (Friday) and to-morrow.

**NINE ELMS, S.W.**—The Local Government Board having sanctioned the purchase of a site at Nine Elms on which to erect additional baths and washhouses for Battersea, the vestry have approved the estimate of £25,000 for the erection of the necessary buildings, and at a meeting last week it was resolved to invite designs for the same, with a premium of £100 for that placed first.

A Board school to accommodate 400 children was opened at Bynea on Monday last, executed from plans prepared by Mr. J. B. Morgan, M.S.A., architect to the Llanelly School Board.

At Tuesday's meeting of the City Commissioners of Sewers, an arrangement was adopted for acquiring the freehold interests in the ground needed to widen the public way in front of No. 98, Fleet-street, for £3,750, the commission paying in addition the rent from April 1, 1896, to the date of completion. A sum of £598 9s. 9d. was ordered to be paid to the Office of Works in respect of an improvement in front of the General Post Office in Newgate-street. In view of the widening of Fleet-street, it was decided to move the obelisk in Ludgate-circus so as to coincide with the altered line of footway.

The only known portrait of William Gwavas, barrister of the Middle Temple, London, improprator of Paul, Cornwall, has been presented to the Royal Institution of Cornwall by Mr. J. D. Eays, who acquired it from the collection of the late Mr. G. B. Millett. This William Gwavas, born in 1676, was buried at Paul in 1741. His MSS., chiefly relating to the old Cornish language, are in the British Museum.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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### NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIII., LIV., LV., LVI., LVII., LVIII., LIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—H. V.—G. H. E.—R. C. Co. (Newport).—L. J. T.—G. B. and Son.—K. M.

"BUILDING NEWS" DESIGNING CLUB.

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## Correspondence.

### R.I.B.A. ELECTIONS.

To the Editor of the BUILDING NEWS.

SIR,—Since the publication of my last letter, I have ascertained, from an Institute paper, that between May 5, 1896, and May 3, 1897, twenty-eight meetings of the council were held, but no less than sixteen of the members each attended only on an average of 2½ occasions.

Although all but two or three of these gentlemen are renominated for the coming session, yet five of them never put in an appearance, four attended at one meeting each, and two of them were seen twice!

But one of the members of the council, who was unable to attend any of the council meetings, atoned for his twenty-eight absences therefrom by his presence at the Institute Dinner at Manchester, when he proposed the toast of "Architecture and the Sister Arts"!—I am, &c.,

A PLUMPER FOR NEW CANDIDATES.

London, May 9.

### SMOKY CHIMNEYS.

SIR,—"Pot" has raised a potential question. It unfortunately happens that the most important constructional parts of a house—those upon which the health and comfort of the family depend, namely, the drains and smoke-flues—are both out of sight, and both woefully neglected, the modern builder sadly lacking conscience.

As regards flues, in the case mentioned the



sudden constriction of a 12in. by 9in. flue to fit the chimney-pot would be quite sufficient to embarrass the draught, and we come at once to the question, Why should flues be of the size specified, 12in. by 9in.? There is no philosophical reason given in books for this size, and now the consensus of opinion is in favour of 9in. by 9in. This would about fit the base of pot, a good pot being square at bottom; but a square shape does not make a perfect flue. The corners assist the accumulation of soot, and the round brush of the sweep cannot completely clear it away. It, Sir, appears to me that the fittest of all flues is a glazed 9in. pipe. It best allows the passage of the smoke, retains more of the heat, and we get rid of the vile paring so general. The pipe-flue has been objected to, inasmuch as it "allows soot to fall." But it seems to me that, with reasonable gradients, the soot will not accumulate, and therefore cannot fall.—I am, &c., M.

### CHIPS.

A dastardly outrage, as to the authorship of which there is at present no clue, was committed the other night at the "Luckie Horseshoe" studios, Exeter. An alabaster crucifix, which was destined for Paignton Church, was smashed into eight pieces. The fragments are exhibited in Messrs. Harry Hems and Sons' front studio windows, accompanied by a somewhat grim, but quite characteristic, notice that a reward of £20 will be given for information leading to the conviction of the author of the disgraceful mutilation in question, and of £10 for intelligence of his death.

The new district hall in Edgcombe-street, Stonehouse, of the South Devon Branch of the Kent Unity Independent Order of Oddfellows, was opened on Saturday afternoon. The building, which has cost £3,000, has been built by Mr. A. N. Coles, from designs by Mr. A. W. Debnam, of Plymouth.

A destructive fire occurred on Saturday in the joiners' shop of the finishing and repairing works of Messrs. J. L. Thompson and Sons, shipbuilders, Sunderland. This portion of the works, which has a frontage of 100 yards to the river, was entirely destroyed.

A large chancel screen has been erected in St. Paul's Church, Maidstone, as a special gift. It is of carved oak. The upper part of it is filled with tracery work, and contains figures of St. Raphael, St. Michael, St. Gabriel, and St. Ursiel, while the cross beam is also carved. Additional interest is invested in the screen from the fact that it was sketched out by the late Archbishop Benson in May last, after holding a confirmation in the church, in the course of a conversation with the vicar. These have been followed by Mr. Medland, of Chancery-lane, W.C., who designed the structure, which has been executed by Mr. J. T. Wilson.

The city council of Liverpool approved at their last meeting the proposal to reconstruct the public baths at the Pierhead, at an estimated cost of about £40,000, after having obtained the opinion and advice of the city engineer (Mr. Boulnois) and the Dock Board engineer (Mr. Lyster) as to the stability of the foundations, and to invite competitive designs for the elevations.

On Tuesday week, Mr. Walter A. Ducat, an inspector from the Local Government Board, held an inquiry at St. Agnes in reference to the application of Truro Rural District Council to borrow £3,000 and £200 respectively for works of water supply and sewerage for St. Agnes. Mr. R. H. Worth, C.E., of Plymouth, produced and explained the plans.

New public halls in the High-street of Selkirk, erected at a cost of £7,200, were formally opened on Friday by the Duke of Buccleuch. The buildings contain a large central hall fitted with a recessed gallery, a smaller hall, and caretaker's house, a suite of retiring-rooms and other accessories, and several committee-rooms. The architect was Mr. Hippolyte J. Blanc, A.R.S.A., Edinburgh.

The foundation-stones were laid last week of new Wesleyan Sunday-schools at Bradley, near Bilston. The cost is estimated at £2,000. The builder is Mr. H. Cave, Wolverhampton, and the architect Mr. J. Rowe, Bilston.

The tender of Messrs. Goddard, of Farnham, to erect a new police-court in the Archway-road, Highgate, has been accepted by the Middlesex County Council. It will cost £6,290.

Business was very good at the Auction Mart last week, although the properties offered possessed no special importance. The supply was plentiful of the classes of investments most in demand, and, where unduly high reserves did not stand in the way, success rewarded the efforts of the auctioneers. The aggregate realisation was £142,874, which compared favourably with that recorded for the corresponding week of 1896—£91,564.

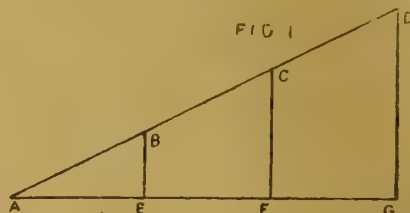
## Intercommunication.

### QUESTIONS.

[11661.]—**Building By-Laws.**—Clause 35 of the Model By-Laws states that "The open space inside any partition wall or between the joists in any wall shall be stopped with brickwork, concrete pugging, or other incombustible material at every floor and ceiling." I should be glad to know whether—say, in the case of using pugging—it is intended that it should be pugged from floor to ceiling, or only made solid at the floor and ceiling. What is the usual custom with lath and plaster partitions?—X. Y. Z.

### REPLIES.

[11656.]—**Temporary Stands.**—(1) The proper load per foot super, to assume should not be less than 700lb. (2) It should be treated as a live load. (3) The factor of safety for temporary timber structures should certainly be higher than that usually taken for permanent structures. The committee appointed in America by the Superintendent of Railroads and Bridges gave 10 as the factor of safety in tension, five in compression, six in transverse rupture, and four in shearing, for timber. (4) The difference in stability between the two trussed bearers would be appreciable. The load being 80wt., probably 30wt. will be brought at B and C. In Fig. 1 the load at E will be 30wt., in Fig. 2 the load at E', transverse to the line A' G', will be 30wt.  $\times \cos^2 26^\circ 35'$



= 24wt., or about 700lb. less than at E. Again (the beams AG and A' G' being under combined tensile and transverse stress), the bending moment at E, even if the transverse load there had been the same as at E', is greater than that at E'. Neither of the beams, however, are trusses, properly speaking, and it would be safer and more economical to put tension numbers as shown at E' C' in Fig. 2; and, instead of taking C' F' to F', take it to G'. The structure would then be properly braced. The tension member E' C' could be easily made by two planks, securely nailed on either side of the beams at E' and C'. The joints at B' and C' should be mortise and tenon, that at A should be oblique mortise, generally with a strap; at E' a bridge joint, and at G a mortise and tenon, and would be strengthened with a broad arrow strap. These straps need only be light. The strength of the joints should be estimated by considering the thrust down the member, and the area of the surface at the end of the joint to resist that thrust. "Inquirer" should bear in mind that A' B' C' D' (or A B C D) being under combined bending and direct pressure, should be calculated for such combined pressure; 5in. by 4in. stuff would, however, leave an ample margin of safety, even with the worst timber.—A.I.C.E.

[11659.]—**Country Church.**—No approximate price could be arrived at. A good deal must depend upon the distance of site from railway station and quarry, and the character of the stone. The internal size of nave for 272 persons would be about 55 by 25ft., and chancel and aisle would hold the remainder. Shall be happy to give further information if written to.—E. GILES, Elgin House, Kenilworth.

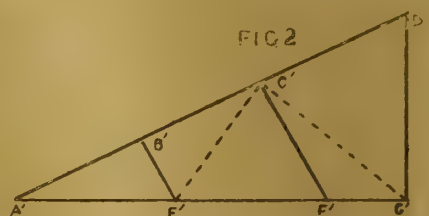
The work of restoring the sea-wall in front of the Grand Hotel at Lowestoft, which has been executed by Messrs. B. Cooke and Sons, contractors, of Victoria-street, S.W., and Battersea, and the engineer of which was Mr. W. J. Roberts, is now finished. The former wall was not strong enough to resist the force of last January's storm, and was consequently overturned.

The Urban District Council of Horfield having applied to the Local Government Board for sanction to borrow £5,000 for the purchase of land at Filton and the erection thereon of an infectious diseases hospital, an inquiry was held on Friday by Mr. Arnold Boyle, C.B., of the Medical Department of the Local Government Board, concerning the application. Evidence was given by Mr. A. P. I. Cotterell, surveyor to the Horfield urban district council, and by Dr. Parry, the medical officer of health, in support of the scheme; and by the Duke of Beaufort, representatives of the Great Western Railway Co., and other landed proprietors in opposition.

On Saturday the different sections of the building trades at Kettering held their first annual May festival in the Victoria Hall. A meat tea, to which about eighty sat down, was followed by a meeting, when addresses were given by Mr. J. Andrew, of London, president of the General Labourers' Union, and Mr. J. Cragg, of Leicester, secretary of the Amalgamated Society of Carpenters and Joiners. In the absence of Mr. C. Saunders, Mr. H. A. Cooper, architect, presided. The speeches had special reference to the great advantages which must accrue to the workmen from national, and also international, federation.

## WATER SUPPLY AND SANITARY MATTERS.

**HAVERHILL.**—The new works of water-supply for the town were inaugurated on Thursday in last week. They have been carried out at a cost of £10,000, and occupy a site on Camps-road, one of the highest points in the town. The plans were prepared by Mr. John Kemp, A.M.I.C.E., formerly surveyor of the town, and now surveyor of Hampton, and, after alterations suggested by Mr. Radford, an expert consulted by the urban district council, provided for a covered reservoir with a capacity of 150,000 gallons, two settling tanks each of a capacity of 100,000 gallons, an engine-house, a cottage, and four miles of mains. The well, which is in the engine-house, has a depth in brick of 103ft., with a bore of 15ft., making a total of 253ft. It is 7ft. 6in. in diameter, and the bore is 8in. The work has been carried out under the superintendence of Mr. Thos. Cockrill, A.M.I.C.E., the surveyor, with Mr. W. Lindley Catlin as clerk of the works, by the following contractors:—Mr. Ingold, Bishop Stortford, the well; Mr. Selden Hipwell, of Wisbech, the reservoir, settling tanks, and buildings; Mr. J. Roberts, of West Bromwich, the mains; and Messrs. Crossley Bros., of Manchester, the pumping machinery. The last-named section of the scheme includes the first installation in the



world of a system of pumping invented by Mr. Jas. Atkinson, now engaged by Messrs. Crossley. The principle of his system is the forcing of the water from the well by means of a body of air which is alternately compressed into one chamber and exhausted from another. When the latter chamber is filled an automatic valve reverses the suction and compression so that the chamber which was last filled is discharged by compressed air, and the pressure that remains in the discharged vessel is brought back into the air compressor; consequently the power is not lost. The capacity of the plant enables 10,000gal. an hour to be pumped from the well into the settling tanks and another 10,000 an hour out of the settling-tanks into the high-service reservoir or directly into the main. The water is pumped direct from the chalk. The motive-power is supplied from the gas works of the urban district council, and is utilised in two Otto gas-engines of 26 indicated horse-power and 12 nominal horse-power.

The city council of Bristol received on Tuesday a report with regard to the additions to the asylum. It has been found necessary to provide more accommodation on the female side of the house, and plans have been prepared for the erection of four new wards to accommodate 150 female patients, a nurses' annexe, a dining and recreation hall, and an isolated hospital. With these additions, estimated to cost £31,000, the asylum at Fishponds will afford accommodation for 391 males and 550 females. The report was adopted.

A new Liberal club is being erected at Alberton, West Riding, at a cost of £1,200, exclusive of site and furnishing. The style adopted is Domestic Gothic. On the ground floor there will be a committee-room, 15ft. by 12ft.; a card-room, 15ft. by 15ft.; and a reading-room, 15ft. by 15ft. The reading-room and card-room will be divided by folding-doors. From an entrance-hall a wide staircase gives access to the first floor, occupied by the billiard-room, to be furnished with two tables. A caretaker's house is attached.

A new Congregational church in Hartington-road, Liverpool, was opened on Friday. It consists of nave and transepts, with tower and spire. The east end is finished with a short apse, opening by an arch its full width into the church, containing an organ, now in course of construction by Messrs. Norman and Beard, of Norwich. The church will accommodate about 500 worshippers, with provision for future enlargement. The style is an adaptation of the Middle-Pointed period. The walls are faced with Edwards's Ruabon red brick and yellow freestone dressings. The internal arches of all openings are turned with moulded red brick. The main principals of the roof are of laminated arches resting on stone corbels, and all the carpentry is exposed to view. The floor is of wood block pavement. The whole of the work has been carried out from the designs and under the supervision of Messrs. W. and J. Hay, architects, by Messrs. J. Paterson and Son, the general contractors.



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## ILLUSTRATIONS.

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OXFORD.—CHURCH OF ST. PETER, HORNSEY.—DESIGNS  
FOR COAL-BOXES.—HOUSE AT SKEGNESS.—THE SIR  
AUGUSTUS HARRIS MEMORIAL DRINKING FOUNTAIN.

## Our Illustrations.

HER MAJESTY'S THEATRE, HAYMARKET.

THIS new theatre, just opened, was illustrated by us in the BUILDING NEWS for July 31, 1896. We now publish a view, taken from the drawing at present at the Royal Academy. The building has been erected by Mr. H. Beerbohm Tree, partly on the site of the old County Hotel in Charles-street, and on a portion of the site of the old Opera House, called Her Majesty's, which name has been given to the new theatre by permission of the Queen. The theatre has a frontage of 86ft. to the Haymarket, 156ft. to Charles-street, and 90ft. to the Royal Opera Arcade, the building standing therefore isolated on three sides; it forms a handsome addition to the Haymarket, and is very substantially built of Portland stone. The style is French Renaissance, the centre part of the façade on the first floor being devoted to an open loggia level with the foyer. The building is surmounted by a cupola covered with copper. The theatre is arranged for an audience divided into five different classes. On the ground floor, level with the street, will be found the orchestra stalls, pit stalls, and the pit. The first floor will be devoted to the dress circle and family circle. The second tier consists of the upper circle, amphitheatre, and the gallery behind. The five doorways in the centre of the Haymarket façade underneath the loggia open into a vestibule exclusively for the use of the two classes of the stalls and the dress and family circles, and the stalls have a third way out, level with the pavement in Charles-street. The pit has one entrance in the Haymarket and another in Charles-street. The upper circle and the gallery have the same, that is to say, five classes of audience have each two distinct ways out, opening into different streets. Every division of the audience has cloak-room accommodation and refreshment saloons. The staircases to the upper tiers are of the uniform width of 4ft. 6in., those to stalls and dress circle 6ft., formed of concrete, with a rise of only 6in., no flight having more than twelve steps. The stage is large, having a width of 70ft. by a depth of 50ft., with recesses for scenery in addition. The whole of the block of buildings in Charles-street is devoted to entrances, &c., on the ground level, the offices of the theatre and dressing-rooms being on the floors above. One special feature of the plan is that a central ticket office has been arranged so that every class of the audience can pay and take tickets at the various entrance-doors controlled from one central office or bureau. The dimensions of the theatre are as follow:—Width of the auditorium, 70ft.; curtain line to back wall of pit, 61ft.; curtain line to back wall of stage, 50ft.; curtain line to front of dress circle, 34ft.; curtain line to front of upper circle, 39ft. 6in.; proscenium opening, 35ft. wide and 29ft. high; pit floor to centre of auditorium, 45ft.; stage floor to gridiron over it,

60ft.; stage floor to cellars, 23ft. The stage and the auditorium are entirely separate, there being two party-walls and an open space between them 9ft. wide, above the proscenium arch. There is constructed on the stage side of the proscenium wall, and closing up the whole of the opening an hydraulic fire-resisting curtain in one piece, which will be taken up without any rolling, and available to be let down at any moment in 30 seconds. This forms a complete severance between stage and auditorium, and a fire may rage on the stage without the audience being aware of it. Water is laid on from high pressure mains, and hydrants are placed on either side of the theatre at every level. The style adopted for the auditorium of the theatre is Louis XIV. There are private boxes on each of the tiers adjoining the proscenium, and separated from it and other parts of the auditorium by marble columns. The hangings are of cerise-coloured embroidered silk, and the walls generally are covered with a paper of the same tone. The seating for stalls, dress, and family circles is in arm-chairs, covered with velvet the same colour as the curtains. The tableau curtains are of velvet of a similar tone, behind which is the act drop of tapestry copied from one of the Gobelins tapestries now in Paris. The whole of the theatre and annexes are lighted by the electric light taken from three centres, so that should any one centre fail the other systems are always available. Hanging from the ceiling is a cut-glass and brass electrolier, and brackets of Louis XIV. style are fixed round the box fronts and on the side walls. The foyer, opening from the corridor to the dress circle, is ornamented and decorated in a style similar to the auditorium, as also are the staircases leading to it from the vestibule. The warming and ventilation have been very specially considered, it being intended that the theatre should be kept at a uniform temperature of 62° all through summer and winter. In the basement is a large chamber containing a very powerful fan, which pumps air into the theatre after passing round hot-water coils. From this hot chamber pipes and ducts are conveyed to every part of the auditorium, and from openings in the higher portion of the ceiling shafts are taken directly up to the roof where exhaust fans are placed. It is computed that 10,000c.ft. of fresh air will pass through the theatre every minute, warm in winter and cold in summer. Radiators warmed by hot water are constructed on every tier and every corridor leading to the auditorium, especially with a view to prevent cold currents of air entering in from the different doorways. The fans are worked by electric motors. The theatre has been constructed from the designs and under the direction of Mr. C. J. Phipps, F.S.A., architect. Mr. J. Emblin Walker has been clerk of the works. The electrical work has been done by Messrs. Rashleigh, Phipps, and Co. and others. For the internal decorations and scheme of colour Mr. R. Walker (a personal friend of Mr. Tree's) has been associated with Mr. Phipps. Mr. H. Lovatt, of Wolverhampton, did the general builder's work, and Messrs. George Jackson and Sons the fibrous plaster ornamentation of the interior.

## THE CITY BUILDINGS, OXFORD.

THESE buildings were opened by H.R.H. the Prince of Wales on May 12th. They comprise municipal offices, council-chamber, mayor's parlour, committee-rooms, &c.; town-hall, public library, and police-station and court. The frontages are entirely in Clipsham stone, and the roofs are covered with stone slates. The majority of the internal joiner's work is in wainscot. The design was selected in competition, and the buildings have been in course of construction for nearly four years. Messrs. Parnell and Son are the general contractors. Mr. H. T. Hare is the architect. We illustrated the plans of this design, and all the others of the final competition, in the BUILDING NEWS for July 8, 15, 22, and 29, 1892.

## CHURCH OF ST. PETER, HORNSEY.

THIS drawing, giving a view of St. Peter's Church, Hornsey, from the north-west, is now on exhibition at the Royal Academy, and we add a plan of the building. Mr. James Brooks, F.R.I.B.A., is the architect; but we have not been favoured with any particulars of the work. The morning chapel is situated on the north-east side of the chancel, and has a separate entrance, so that for week-day celebrations the church itself need not be always opened. This is a great advantage. The vestry is an unusually large one, and being isolated from

the church by a corridor lobby or porch passage, could be well used for parochial purposes. We have already remarked upon the design when reviewing the principal architectural drawings at the Royal Academy.

## SILVER MEDAL DESIGNS FOR COAL-BOXES.

THESE capital designs by Mr. A. H. Baxter, of Leicester, are two of three for which a National Silver Medal was awarded in last year's Students' Competition at South Kensington. The Science and Art Department authorities, in further confirmation of the judges' award, have, we understand, purchased these drawings, which have been lent us for publication. At an early date the remaining design will be given. There is a freshness and appreciation of the capabilities and well as the limitations of brass, copper, and iron in these patterns, which merit commendation, and in the official report of the Examiners—Messrs. Maurice B. Adams, Lewis F. Day, and W. De Morgan—the following reference to them is made:—"These are just the workmanlike and practical sort of drawings of which the Examiners would like to see greater numbers." The copies of these details now illustrated have all the author's marginal notes upon them, and as the drawings so well display the designs, little further description seems necessary. The upper coal-box is in copper-repoussé work with border of conventional suns round the sides, and heads of birds occur at the four corners. The ornament is kept free from elaboration, with a view of giving a simple and broad effect when the firelight plays on it. The second coal-box is in copper-repoussé and stained wood (greyish green). The box has a grating midway through which the small coal falls, and the lumps remain in the upper division; a pair of tongs fit on the back for use in the case of the lumps, and a shovel underneath for use for the small coal, to which access is gained by a fall-down door in front.

## SINGLE HOUSE AT SKEGNESS.

THE aim of the architect in designing this house, geometrical drawings of which we illustrate to-day, was to build an economical, yet comfortable, middle-class house that might provide lodgings for visitors during the summer months. Local bricks and tile-hanging are used in its construction, and the roofs are covered with tiles. The plans and elevations herewith given sufficiently elucidate the design, which is by Mr. Henry G. Gamble, architect, of Lincoln.

## SIR AUGUSTUS HARRIS MEMORIAL FOUNTAIN.

THE memorial fountain to the memory of the late Sir Augustus Harris is now being erected on ground in the front of Drury-lane Theatre, kindly and graciously given by His Grace the Duke of Bedford. The materials are polished granite and rough granite. The masons' work is being carried out by Messrs. Higgs and Hill, and the bust will be executed by Mr. T. Brock, R.A. The cost of the work is being defrayed by public subscription, some £2,000 having been collected, and £1,000 of which is being given to Charing Cross Hospital for a bed for the dramatic, musical, and variety professions. The New River Co. have kindly consented to supply the water without charge. The whole work is being carried out from Mr. Sidney R. J. Smith's design, he acting as hon. secretary as well as hon. architect. A large and influential committee (of which H.R.H. the Prince of Wales is patron and Alderman Frank Green hon. treasurer) are carrying out the wishes of the subscribers in the matter.

The Council of the Royal Institute of British Architects announce that, owing to the Diamond Jubilee celebrations in London and the provinces, and the probable inconvenience to country members in attending the annual dinner, which was proposed to be held on the 17th June, they have considered it desirable to postpone it till next November.

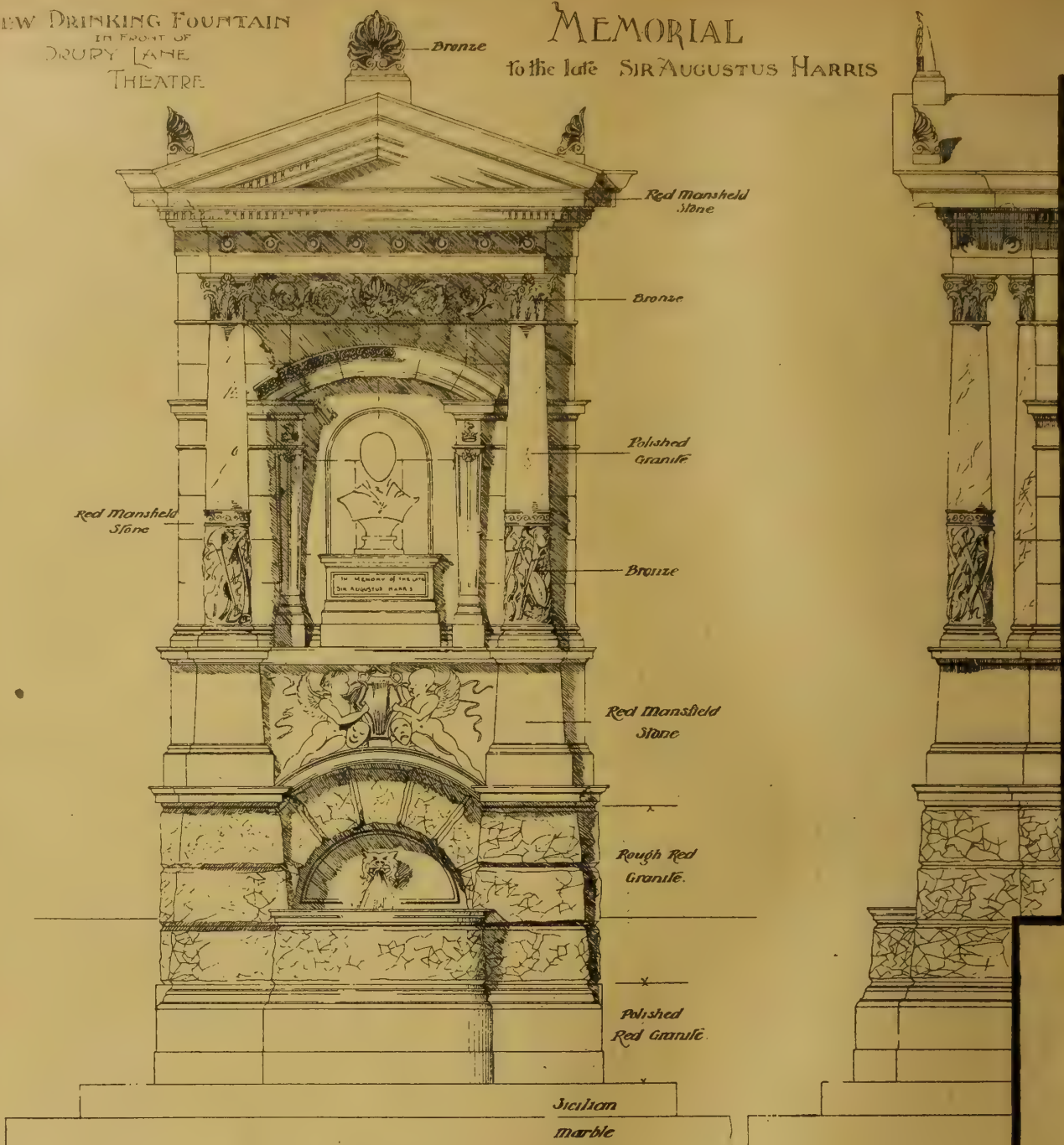
The Tyrolean village of Windisch Matrei, known to all visitors to the Grossvenediger and Grossglockner, has been burnt down, eighty houses, including all the inns, the town-hall, and hospital, being destroyed. The church and about a dozen houses were saved. No lives were lost. The damage is estimated at £40,000, of which about two-thirds is insured.

It is announced that G. E. Forrest, E. L. Forrest, and A. Morgan (trading as Forrest and Co.), 500, Bethnal Green-road, builders, have dissolved partnership, so far as regards E. L. Forrest.

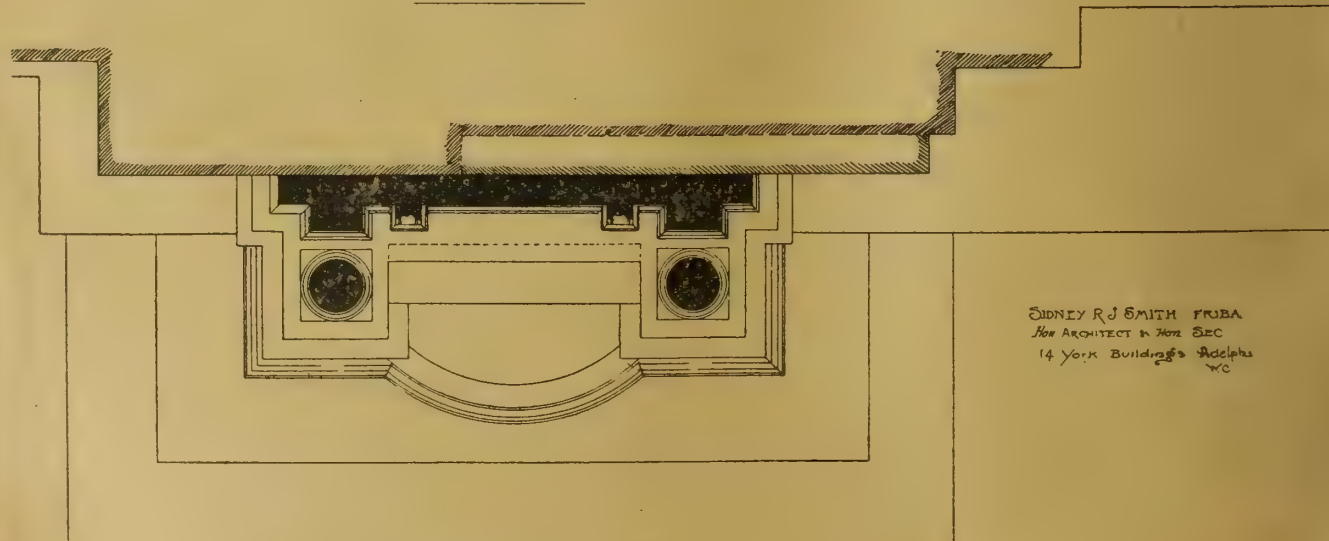


NEW DRINKING FOUNTAIN  
IN FRONT OF  
DRURY LANE  
THEATRE

MEMORIAL  
to the late SIR AUGUSTUS HARRIS



— ELEVATION —



SIDNEY R J SMITH FRIBA  
Now ARCHITECT & Hon. SEC  
14 York Buildings Adelphi  
WC

— PLAN —

— Scale of Feet —

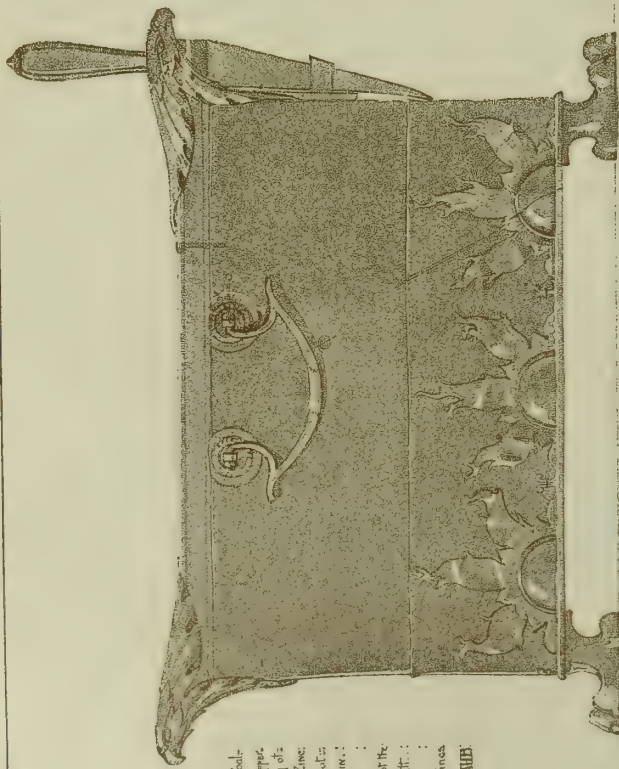




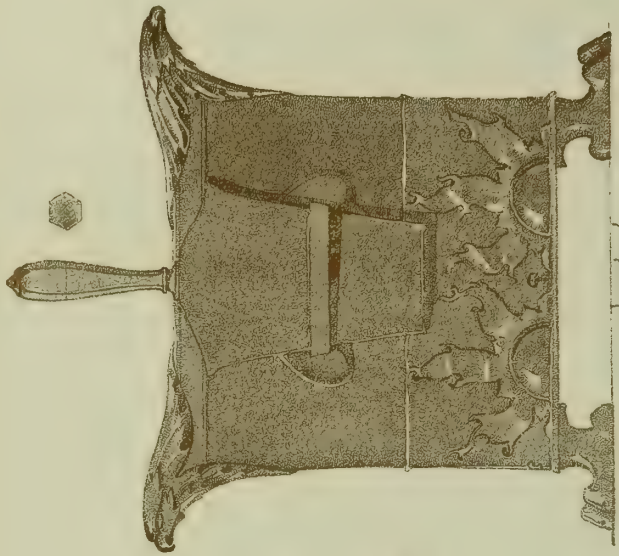


Design for a Coal-  
Suffle to be executed at Gipsy  
foundry (with the exception of a  
Tones handle of Shovel & Zinc  
Case for Coal which lifts out in  
The Coal-trough Suffle to be in  
Repoussé.  
The Surface of Shovel & at the  
Claws of the Tones to be left  
rough.  
Sections of Working Drawings  
are on overy

AUB



SIDE ELEVATION.



END ELEVATION.



TON.



perspective.  
sketch.



long elevation.



long  
elevation.





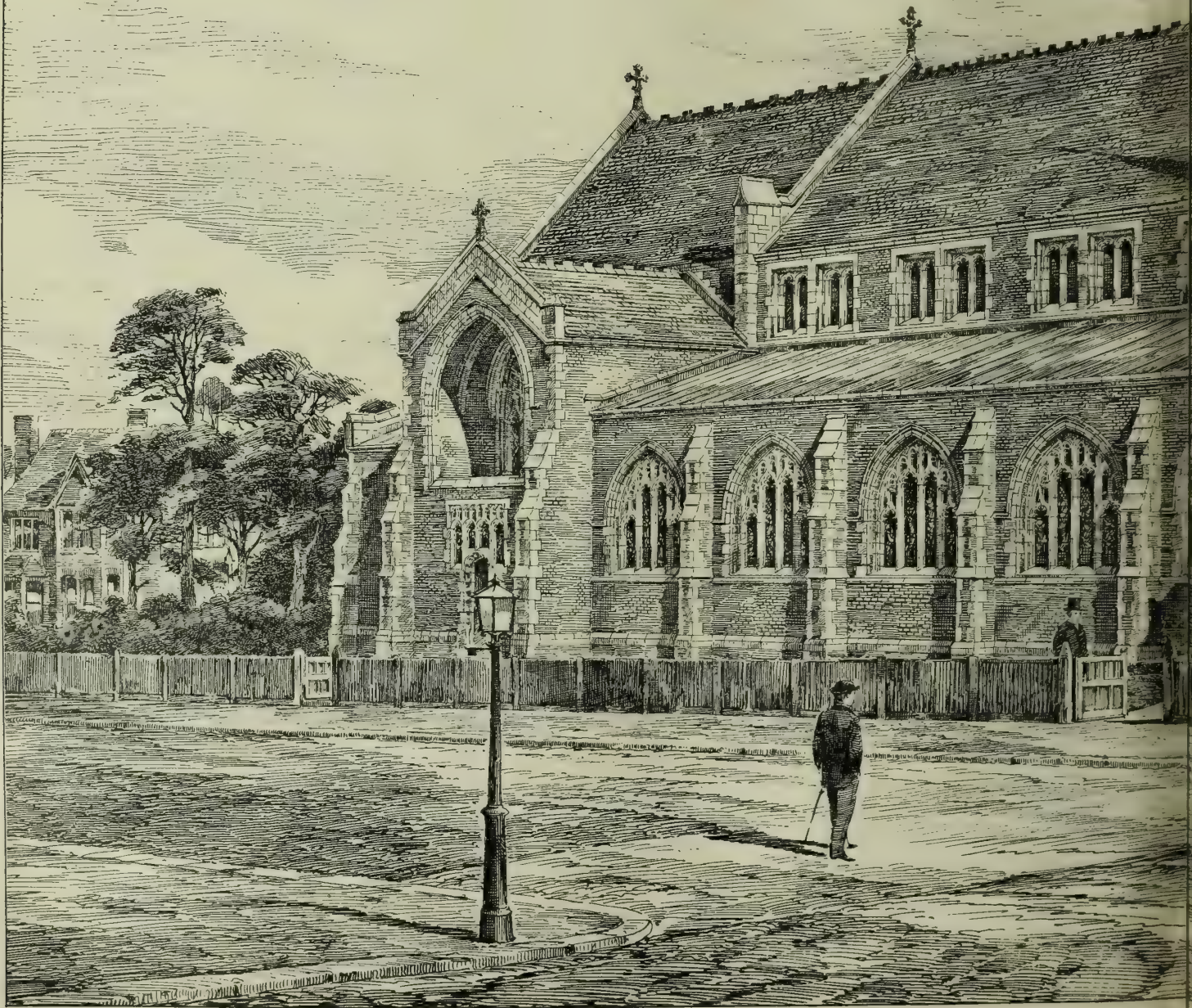
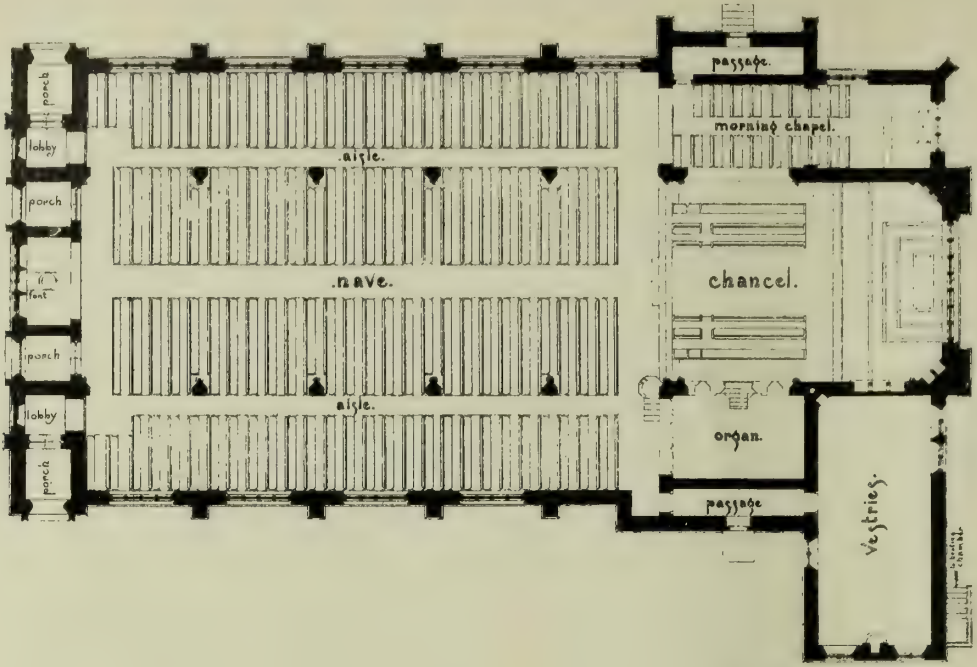














# Ch of S. Peter. Horpsey

D. M. Aiew

James Brooks & Son. Architects  
35 Wellington St. Strand. W.C.















OPENED BY H.R.H. THE PRINCE OF WALES MAY 12 1897

NEW MUNICIPAL

H. THAR



VS, MAY 14, 1897.



BUILDINGS · OXFORD ·  
RIBA ARCHT

"PHOTO-TINT" by James Akerman 6, Queen Square, London, W.C

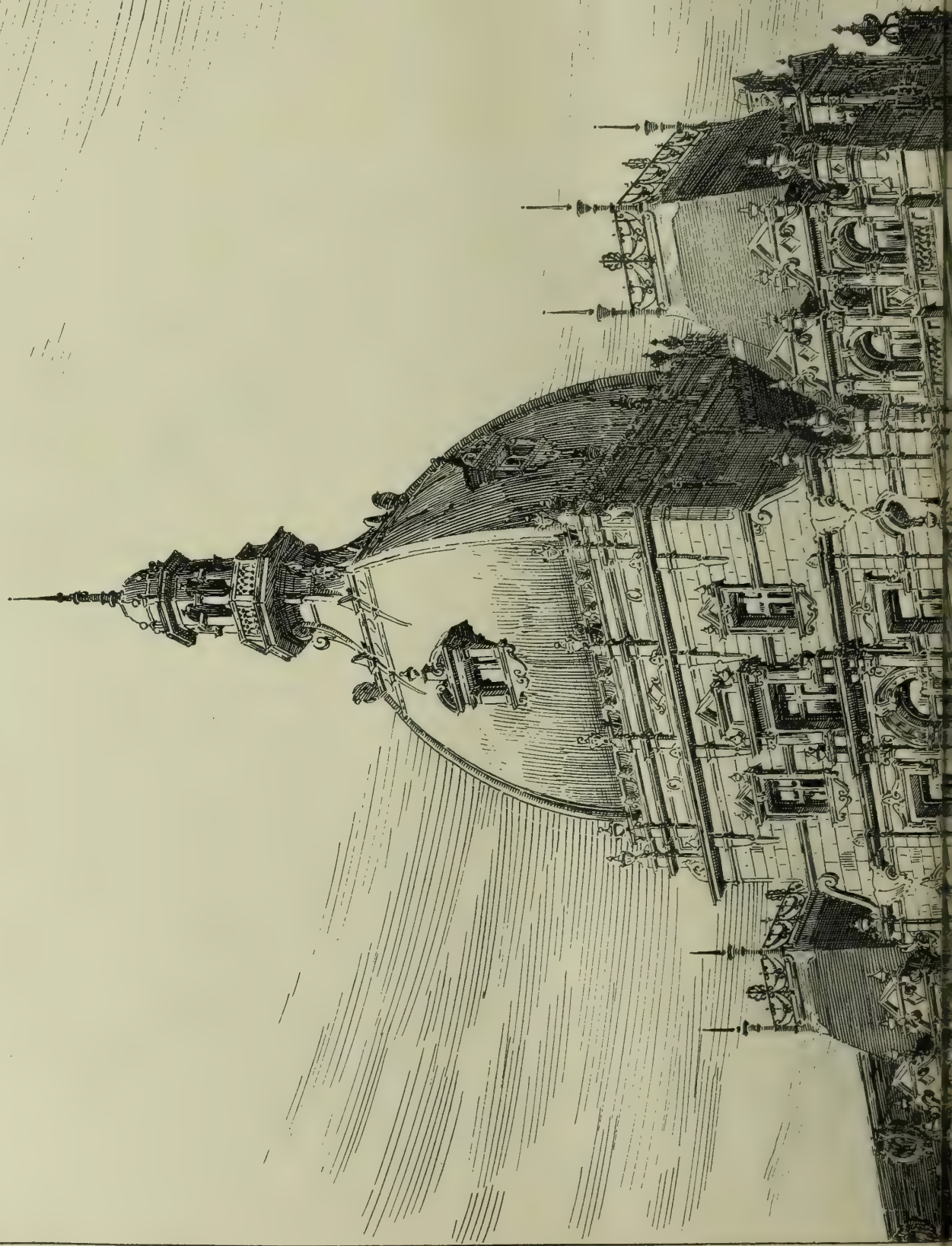














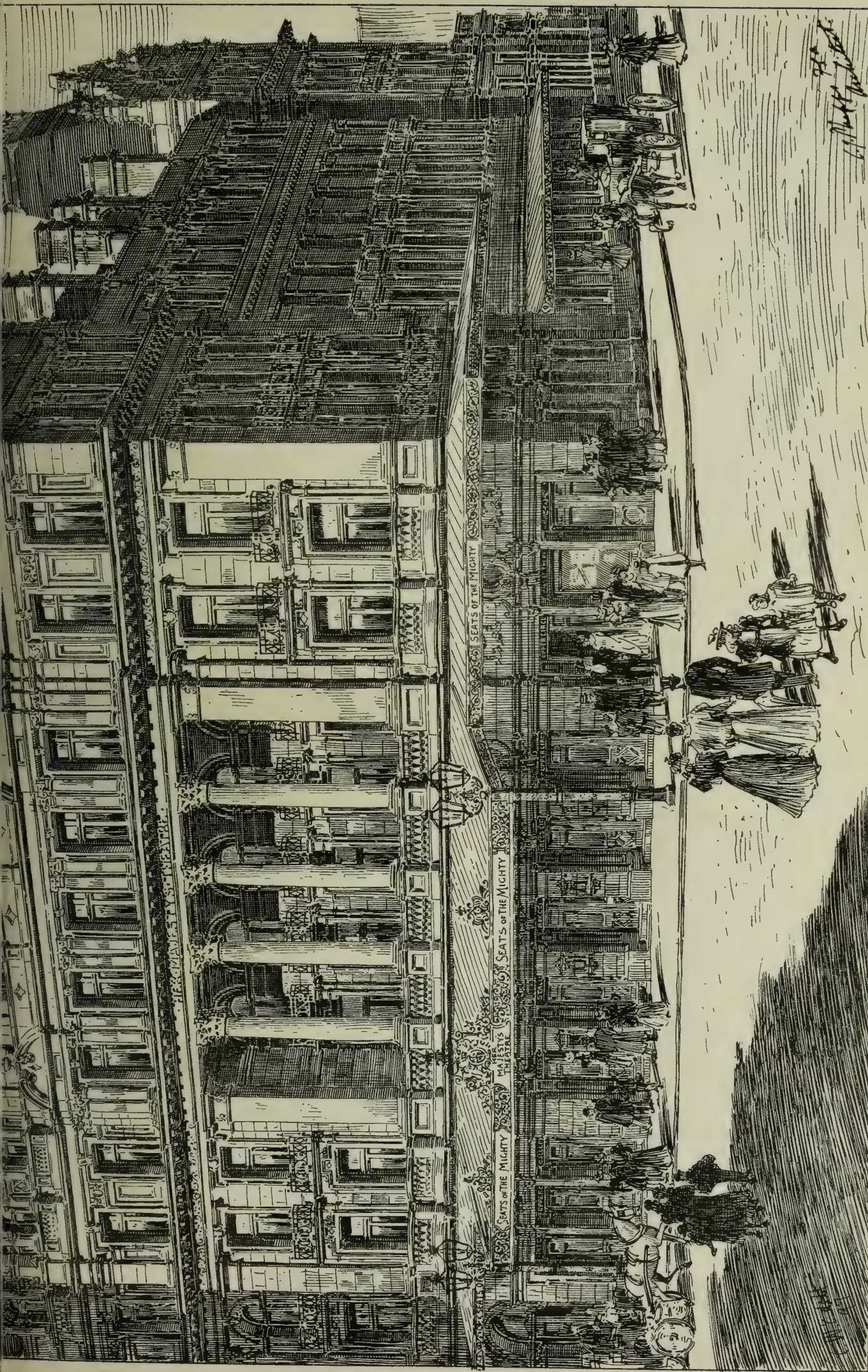


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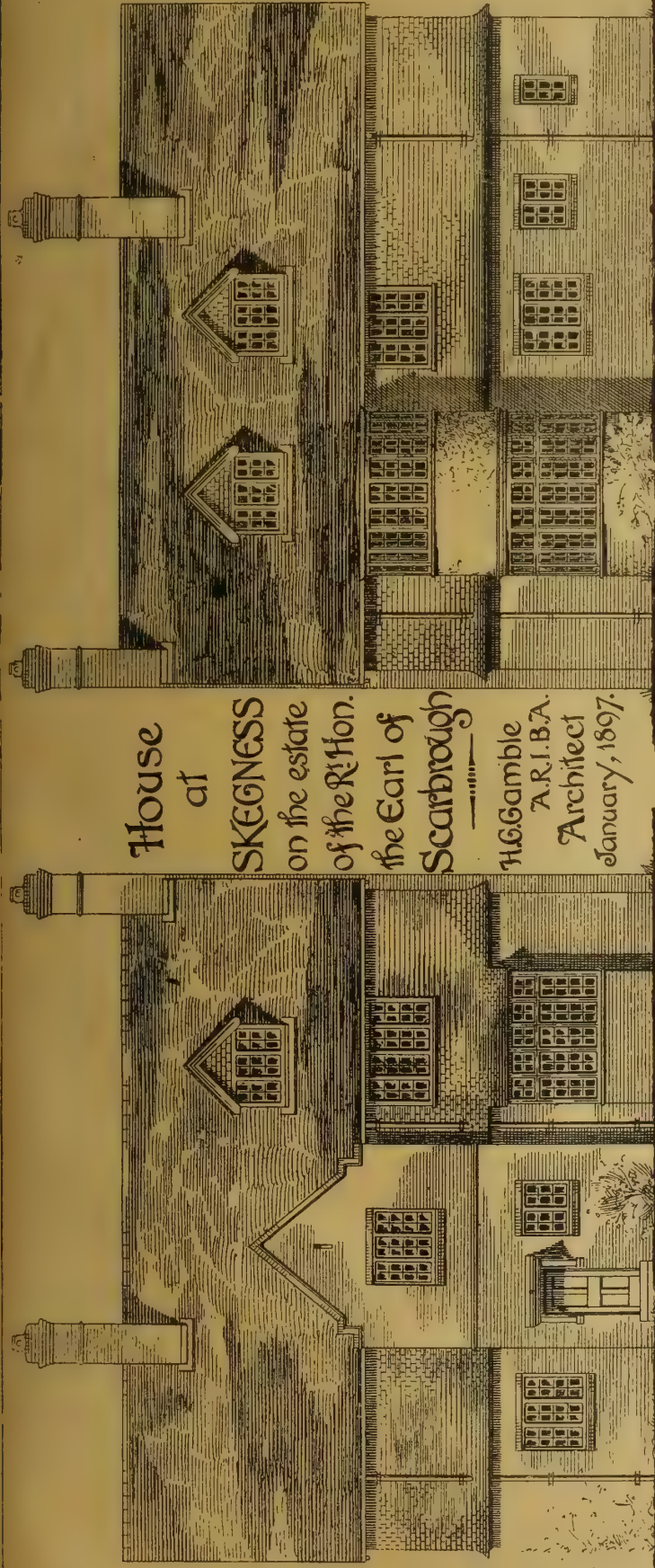
"HER MAJESTY'S" THEATRE, LONDON.

C. J. Phipps, F. S. A.









North Elevation

Scale of feet  
0 5 10 15 20

South Elevation

Three attics  
above



Ground  
Floor  
Plan

First  
Floor  
Plan





## LEGAL INTELLIGENCE.

**COMPENSATION CASE.—IMPORTANT POINTS RAISED.**—On the 16th, 17th, and 23rd February last, the case of Reid v. Wallasey Urban District Council, was heard at the Liverpool Land Association Rooms. Mr. George Bradbury, F.R.I.B.A., president of the Liverpool Architectural Society, sat as umpire. Mr. T. H. McGovern, F.L.A.S., Liverpool, was arbitrator for the claimant, Mr. Hugh Reid, and Mr. Henry Hartley, F.R.I.B.A., Liverpool, was arbitrator for the council. Mr. Tobin, barrister, instructed by Messrs. Simpson, North, and Co., represented Mr. Reid. Mr. Wm. Danger (law clerk) appeared for the promoters. The claim was made under Sec. 303, Public Health Act, 1875, and was in respect of damage done to the claimant's crops on the Model Farm, Mill Lane, Lescan, and for prospective damage which might arise owing to the easement which the construction of a sewer running through the farm would give. It appears that a 12in. sewer had been laid by the local authority some 16 to 18 years ago with two lamp-holes, and now a 21in. sewer with nine ventilating manholes had been substituted. The board did not proceed under Sec. 18 of the Act, which deals with a reconstruction, but did so under Sec. 16, which refers to new sewers. No evidence was tendered by the council as to having purchased an easement from the owners of the fee simple, or that compensation had been given to the previous tenant; Mr. Reid had a two years' certain tenancy. The claimant was examined at length regarding the agricultural portion of his claim, which amounted to £212 9s. 4d., for present damage, in addition to which, Mr. Thos. Cook, F.R.I.B.A., J.P., valued the future damage at £81 4s. 11d., including some other items—viz., interference with the level of the ditch and subdrainage—in all £293 6s. 8d. Mr. Sketch, farmer and auctioneer, Aughton, Ormskirk, Mr. J. Wright, farmer, Walton, and Mr. Ramford, farmer, Altcar, corroborated the agricultural portion of the claim. Mr. Danger, on behalf of the council, said he had never heard of any sum being awarded to a yearly tenant in respect of prospective damage; if Mr. Reid was injured in the future in any way, he could make another claim. The council had offered the claimant £50, which he thought was ample. He called Mr. J. T. Wainwright, F.S.I., Liverpool, who valued the damage at £46 9s. 11d., Mr. J. Yeowart, farmer, Cheshire, thought £31 7s. 6d. sufficient, and Mr. Lamb, farmer, Cheshire, assessed the injury at £30. Several of the council's officials gave evidence as to the former levels of the ditch, construction of the sewer, and position of the man-holes, one of which interfered with the water-course in the ditch. Mr. Tobin said that both present and prospective damage had now to be assessed, as his client could not come before them again to make another claim. The easement would carry with it the substitution and repair of pipes, and a right of way along the line of sewer and other privileges, and cited the case of "Codack v. Somerville." Mr. Danger remarked if a sum was included in the award for prospective damage, he would ask that it be mentioned separately, as in such an event he intended to state a case. The umpire and arbitrators visited the locus-in-quo on March 10th, and on the 13th ult. the umpire awarded Mr. Reid the sum of £127 7s. 8d. and costs. No sum is included for prospective damage.

**A CLEVEDON BUILDING DISPUTE.**—At the public hall, Clevedon, on Tuesday and Wednesday in last week, Mr. H. W. Verey, Q.C. (official referee), opened a court to hear the case of Chapman v. Hoddell and Co. This action was brought by James Chapman, a builder, of Bristol and Clevedon, against the defendants, auctioneers, surveyors, and architects, of Clevedon. It was a claim for £497 16s. 11d., due to plaintiff under a contract dated March 14, 1895, or rather arising out of that contract. The agreement was to the effect that there should be three houses built by the plaintiff, all detached, for the defendants for the sum of £1,188, contract price. There were certain extras in addition to the original contract, which, with the contract price, came to £1,713 16s. 11d. Credit had been given for £1,216, leaving the amount claimed. Some of the extras formed a fresh contract. Defendants admitted for one house extras amounting to £16, and for the other two £24 10s. Those sums, with the contract prices, amounted to £1,272 5s., and taking the sum of £1,216 with which they credited defendants, it left £555. Defendants said they supplied materials to the amount of £49 19s., which was to be deducted from the contract price, and brought down the amount said to be due to £55 11s. They put in a counter-claim, saying plaintiff had omitted work to the amount £19 12s. 6d., and that there was a clause with respect to time, under which they were entitled to £52 10s. for one house, and £77 14s. for the other two. The whole amount of the counter-claim was £149 16s. 6d., and, deducting the £5 11s., it brought the total in their favour to £144 5s. 6d.. Plaintiff's counsel traced the history of the contract under which the houses were to be built at Walton Park, and drew attention to the case of "Dodd v. Churton," contending that as a matter of law the defendants were not entitled to a

penny for delays caused, because they arose through extras ordered. The plaintiff was called, and he entered into details of the extras, told how two detached houses were converted into one semi-detached, &c., after the plans had been signed, and attributed much of the delay to defendants not supplying him at an earlier period with certain materials. Mr. F. E. Weatherly cross-examined the witness on these points, eliciting that the total amount of the extras was £525 16s. 11d., and admitted that plaintiff was entitled to £16. Plaintiff estimated the first house he built for £396 to be worth £500. The plaintiff's claim was ultimately reduced to £53. Evidence was also given by Mr. H. Taylor, M.S.A., of Clevedon, and other witnesses. At the conclusion of the evidence, the official referee reserved his decision.

**THE ROYAL GOLF LINKS HOTEL, CROMER.—SETTLEMENT OF THE DISPUTE BETWEEN ARCHITECTS AND BUILDER.**—The Chancery Division action, "Homer and another v. Lavington," which was partly heard before Mr. Verey, Q.C., official referee, on March 10 and 11, was set down for further hearing on Tuesday last. Plaintiffs, Messrs. Homer and Ridler, architects, carrying on business at 35, Bucklersbury, London, sought to recover from defendant, Mr. Charles D. Lavington, builder and contractor, Green Lanes, Finsbury Park, the sum of £1,112 5s., as balance of professional charges, and for work done and money expended on behalf of the defendant, in connection with the erection of the Royal Golf Links Hotel, Cromer, Norfolk. Defendant denied liability. On Tuesday, Mr. Houghton announced that there had been a settlement arrived at. Mr. Lavington, without admitting that he was liable to pay more, had agreed to give Messrs. Homer and Ridler, on the advice of his learned friend, £250 and costs. Terms would be signed, and as to a certificate it very likely would not be necessary to trouble further. Mr. Stevens, for defendant, said they had been led to a settlement in view of the evidence which had been given, upon which they had come to the conclusion that these gentlemen, with whom defendant had had business dealings and probably would have again, had been misled into the belief that they were entitled to more money than defendant thought they were entitled to have. It was not desired that there should be any rupture between them, and if it could be managed without any formal order or certificate, it should be done.

**THE DISCRETIONARY POWERS OF THE L.C.C. AS TO BUILDING ACT APPEALS.—REG. V. LONDON COUNTY COUNCIL.**—In the Queen's Bench Division on Monday, before Mr. Justice Hawkins and Mr. Justice Wright, cause was shown against a rule nisi for a *mandamus* to the London County Council directing them to hear and determine an application in this case. The application which the County Council refused to hear was one made by a Mrs. Webster for the Council's consent for the retention of a wall erected a distance less than the prescribed distance from the centre of the roadway, Pearson's-avenue, Deptford. Mrs. Webster had the wall in question substituted for a wooden fence running between a piece of unoccupied ground and the road. Subsequently on this land she erected stables, the foreyard of which was bounded by the wall. This wall was distant less than 20ft. from the centre of the road, and, having become part of a building by reason of the stables being built, the structure became illegal. The London County Council then took proceedings against the builder of the wall, and he was convicted. The wall, however, was not removed, and further proceedings were then taken against Mrs. Webster. After the building was erected she had applied for the consent of the London County Council. They, however, refused to hear the application. An appeal was made to the special tribunal of appeal created under the Act. Objection was taken on behalf of the Council that there was no decision of theirs given, and, therefore, no appeal would lie. This contention prevailed. The present application was made with the view of being able to get to the tribunal of appeal. Mr. Avory contended that the County Council could not, under the London Building Act, 1894, give their consent to the retention of the wall, which had been built without leave, and was therefore illegal. The application for the Council's consent must be made before the building was erected. Mr. Macmorran stated that his client, Mrs. Webster, had gone before the tribunal of appeal, but the County Council had objected that it had no jurisdiction, as there was no decision for that tribunal to deal with. The object of this motion was to get a decision from the County Council, from which an appeal might be brought. He contended that the County Council might give their consent, though the wall had been erected. When a council could, if the wall were not existent, consent to its being built in exactly the same position as the existing wall stood, it would be unreasonable to say that it was bound to have the wall pulled down before giving consent. The Court discharged the rule. Mr. Justice Hawkins said:—This was an application for a rule nisi for a *mandamus* to the London County Council to hear and determine an

application under section 13 (4) of the London Building Act, 1894, for their consent to the "retention" of a certain wall erected by Mrs. Webster. In the opinion of the learned Judge the Court ought not to make the rule absolute. It was provided in London Building Act, 1894, 57 and 58 Vict., cap. cxxiii., section 13 (1), that "no person shall erect any new building or new structure . . . in such manner that any external wall of any such building or structure . . . shall, without the consent in writing of the Council, be in any direction at a distance less than the prescribed distance from the centre of the roadway of any street." That was a prohibition against erecting or extending buildings without the consent of the County Council to a distance less than 20ft. from the centre of the roadway. The Legislature, however, being of opinion that a hard-and-fast rule such as this might work hardship, provided a remedy by subsection (4), which was as follows:—"The Council may in any case where they think it expedient consent to the erection, formation, or extension of any building . . . less than the prescribed distance from the centre of the roadway . . . subject to such conditions and terms (if any) as they may think proper to sanction . . . Any person dissatisfied with the determination of the Council under this subsection may appeal to the tribunal of appeal." Reading the two sections together it was clear that subsection 1 of section 13 prohibited building new structures too near to the centre of streets, while subsection (4) was meant to give power to the County Council to modify that provision. In the opinion of the learned Judge, however, that modified consent must be given before the building was erected. The structure in this case was an illegal structure. He did not think that subsection (4) was intended to compel the London County Council to have to take into their consideration the question whether they should give their consent to structures illegally erected. Mr. Justice Wright concurred. Whether the County Council had or had not power to give consent to a building *ex post facto*, as to which the learned Judge expressed no opinion, at any rate the applicant had no legal right to the grant of a *mandamus* to compel them to hear this application.

**ROWTON LODGING HOUSES AND THE BUILDING ACT.**—At Lambeth Police-court on Tuesday Mr. Hopkins heard two summonses arising out of the erection, by the Rowton Houses (Limited) Company, of a large lodging-house for men, in Churchyard-row, Newington. The first summons was issued at the instance of Mr. Banister Fletcher, district surveyor for West Newington, against the managing director of the company for failing to comply with a notice of irregularity served under the terms of the London Building Act, 1894. The second summons was taken out by the London County Council against the company for failing to comply with a notice from the Council requiring them to cause the building referred to to be set back so that every part of the external walls should be at a distance, in every direction, not less than the prescribed distance from the centre of the roadway. Mr. Horace Avory appeared to support the summonses on behalf of the London County Council, and the defendants were represented by Mr. Macmorran. The question at issue between the Council and the defendants is whether there has, in the erection of the building, been an infringement of section 13 of the London Building Act. Mr. Avory mentioned that it had been suggested to the defendants that they should apply to the Council for their consent to the erection of the building as it now stood, but that the company had declined to apply for such consent on the ground that they had not contravened the Act. It transpired during the hearing of the case that the building will provide accommodation for 800 men, and Lord Rowton, who was one of the witnesses, said it was intended to be a poor man's hotel. After hearing counsel on both sides, Mr. Hopkins reserved judgment.

The plans of Sir A. W. Blomfield, A.R.A., for the restoration of Macclesfield parish church, at an estimated cost of £13,630, were approved at a meeting of the general committee on Wednesday week, and steps will now be taken to raise the necessary funds. Four donors have promised to give the first £4,000.

Subscriptions are being raised for a redress to be placed in Bristol Cathedral as a memorial to Dr. J. C. Ellicott, who will resign next month the see of Gloucester and Bristol, which he has occupied since 1863.

At a special meeting of the Liverpool City Council Sir Arthur Forward made a statement as to the terms on which the corporation had acquired the tramway undertaking. The sum to be paid to the company was £567,375, which, under all the circumstances, he considered a reasonable amount. There was no more unsuitable city than Liverpool for the employment of horse traction, and the corporation must face the question of mechanical haulage in the near future.



## PARLIAMENTARY NOTES.

**PUBLIC OFFICES (WHITEHALL) SITES BILL.**—The Select Committee of the House of Commons appointed to consider this Bill sat on Friday, Mr. Akers-Douglas, First Commissioner of Works, presiding. In the course of the proceedings it transpired that, although a petition had been lodged against the Bill by the London County Council, terms had been arranged between the parties with regard to the points raised by the County Council. The Bill passed through Committee, and was ordered to be reported to the House.

## CHIPS.

At Crown Court Church (Russell-street, Covent Garden), of the Church of Scotland, a new three-manual organ, by Bevington and Sons, of Soho, was used at public worship for the first time on Sunday.

Mr. Edmund Pearse-Burd, a Local Government Board inspector, held an inquiry at Kingswood on Friday respecting an application by Warmley District Council for urban powers for the whole of the rural district and several contributory places.

The block of buildings erected by the Plymouth School Board in Regent-street, as a Higher Grade and Organised Science school, has been opened by Sir George Kekewich, Secretary to the Educational Department. The school has cost £16,000, equivalent to £17 a head.

The organ of Melton Mowbray parish church was reopened on Thursday week, having undergone extensive repairs and improvements at the hands of Messrs. Hill and Sons, London, at a cost of £1,100.

At Poplar town hall, on Monday, the Duchess of Somerset opened a bazaar in aid of the restoration fund of St. Matthias church, Poplar. St. Matthias church is the only church in the parish of Poplar which has a claim to historical interest. It served as a chapel of ease to Stepney, and afterwards became the East India Company's chapel. According to tradition the teak pillars in the church had served as masts of the Spanish Armada. Upon the ceiling of the church is the coat of arms of the original East India Company (1601), and over the vicarage is the coat of arms adopted by the United Company on its amalgamation with the New East India Company (1702-9).

Mr. Alfred Gilbert, R.A., is engaged on a new marble statue of John Bright, to be placed in the central hall of the House of Parliament. Mr. Gilbert will submit his design to the members of the Bright family and to the memorial committee, and will present the statue free of all cost, to be erected in the place where the first one was intended to be.

A new Free church is about to be built at Bank, near New Cumnock, N.B. It will accommodate 400 sitters, and is planned with a nave and one side aisle, separated by an arcade of three pointed arches of a new stone. The roof will be of open timber construction. Session-room, vestry, and lavatory are provided. The church is designed in a phase of Late Perpendicular. Mr. James Kennedy, Ayr, is architect for both the church and the manse, and contracts for both have recently been let to the following contractors:—Mason work, Mr. A. Beattie, New Cumnock; joiner work, Mr. D. Mathieson, New Cumnock; slater and plumber work, Messrs. W. Auld and Son, Ayr; plaster work, Mr. M. Campbell and Son, Catrine; heating work, Messrs. Boyd and Sons, Paisley; glazier work, The Glass Stainers' Co., Glasgow. The cost of church and manse will be about £2,500.

At the monthly meeting of the Birkenhead Town Council, on Friday, it was resolved to make a grant of £3,500 for the purchase of additional land at Bidston Hill, thus making a total area of over 62 acres for the use of the public. It was also resolved to make a mayoral allowance of £500 for the Jubilee year.

Thrapston was *en fête* on Thursday in last week, the occasion being the commemoration of the 60th year of her Majesty's reign. The form of commemorating was by erecting a peal of eight bells in the church tower, and on Thursday these bells were dedicated by the Dean of Peterborough. The bells have been cast by Messrs. Taylor and Co., of Loughborough, and replace a peal of five, one of which was cracked, and the other four were out of tune.

By the throwing of the footwalk into the roadway, and by the introduction of piazzas under the present buildings on the south side of Cook-street, the corporation of Liverpool have decided to widen this important thoroughfare—a much needed improvement which has been before the public for many years. Cook-street is a continuation of the fine thoroughfare known as Victoria-street. The cost of this improvement will be about £30,000, and in case of any differences arising between the corporation and the owners of the various properties, they have mutually appointed as arbitrator Mr. Edmund Kirby, F.R.I.B.A., F.S.I., of Liverpool.

## Our Office Table.

SIR JOHN GORST, M.P., laid on Friday before the Select Parliamentary Committee on Museums of the Science and Art Department, of which he is chairman, a memorial urging the necessity for the completion of the South Kensington Museum which he had received from a large number of distinguished artists in the country, headed by Sir Edward Poynter. The memorialists pray that active steps may be taken by Parliament to complete the building, and they state that they share the opinion already expressed that no more fitting national memorial of the 60th anniversary of the accession to the throne of her Most Gracious Majesty could be made than the completion of a museum which owed its existence to her Royal Consort, and which her Majesty has declared that she has taken under her special and personal protection. The memorial is chiefly signed by painters and sculptors; but among the signatures the names appear of Professor George Aitchison, A.R.A., P.R.I.B.A., Mr. John L. Pearson, R.A., and Mr. Thomas G. Jackson, R.A. A memorial to the same effect has been addressed by the same signatories to the Duke of Devonshire, containing the additional suggestion that the completed buildings should be "hereafter named the Victorian Museum."

A SELECT Committee of the House of Commons began on Monday the consideration of the London County Council (Improvements) Bill, in which Parliamentary sanction was sought for the construction of a new river embankment at Chelsea, the making of a northern approach to the Tower Bridge by the widening of the thoroughfare between Little Tower-hill and Great Prescott-street, the widening of the Strand by the removal of the whole of the houses on the south side of Holywell-street, many of the leases falling in this year, and the widening of the bottom of Tottenham Court-road by the removal of the Bozier's-court "island." Counsel for the County Council opened their case, and called Mr. A. R. Binnie, engineer to the County Council, who gave evidence as to the Chelsea Embankment. He said the foreshore where it was proposed to place the embankment consisted of mud, which was always dirty, not to say disgusting, and, being in a bay, was not subject to the scour of the tide. Of the  $3\frac{1}{2}$  acres that would be reclaimed about 66 per cent. consisted of mud-bank. Under the present proposals the roadway at Cheyne-walk would be widened from 26ft. at some places to not less than 60ft. The embankment would be of concrete faced with granite, and it had been designed with a view to further extension if necessary. Granite was most durable, and, in the long run, would be the cheapest material to use. His estimate of the cost was £38,000. For the opposition, evidence was given on Wednesday by Mr. W. D. Caröe, F.S.A., architect to the Ecclesiastical Commissioners; Mr. David Murray, R.A.; and Mr. Eichus, M.I.C.E.—all protesting against altering the appearance of the reach, and the committee decided that the preamble of the Bill was not proved so far as the Embankment scheme was concerned. Evidence was given on Wednesday and yesterday in support of the proposed northern approach to the Tower Bridge, the cost of which Mr. Binnie estimates at £219,000.

AN important measure affecting London has passed the Commons and is now before the House of Lords. Its object is to confirm a provisional order made on the application of the London County Council, under the Housing of the Working Classes Act, for improving a large area at and near Clare Market and Drury-lane. In connection with the scheme, parts of Drury-lane, Blackmoor-street, and Clare-street are to be widened to 40ft. The number of persons of the working class that will be displaced by the scheme if carried out in accordance with the order is estimated at 3,172, but it is proposed to provide accommodation upon the improvement area for 750, and upon part of the site of Millbank Penitentiary for 1,500 persons of the working class.

THE Public Health Acts Amendment Bill, which has been read a first time, has been drafted by Mr. H. Brevitt (town clerk of Wolverhampton), and is backed by Sir Alfred Hickman, Sir Albert Rollit, Mr. H. Staveley Hill, Sir Walter Foster, Mr. G. Whiteley, Mr. Alfred Baldwin, Mr. Ernest Spencer, and Mr. James Heath. In

their special reports to the House of Commons in 1895 and 1896 the Select Committee on Police and Sanitary Regulations Bills suggested whether the time had not arrived for the inclusion in a public Bill of many of the clauses which are so frequently introduced into private Bills, and which have almost invariably been accepted by Parliament, as it appeared to the Committee that much trouble and expense might be saved if the necessity for application to Parliament for such powers by individual authorities were rendered unnecessary. The object of the present Bill, which is framed upon the principle of the Public Health Acts Amendment Act of 1890, and which was also mainly drafted by Mr. Brevitt, is to enable local authorities by following the mode of the procedure of that Act to adopt the benefit of many clauses which, having been introduced in private Bills of recent years, have been accepted by Parliament. The clauses selected for embodiment in the Bill relate chiefly to sanitary powers, parks and recreation grounds, streets and buildings, police regulations, and street advertisements. As evidence of the success attending the passing of the Public Health Acts Amendment Act, 1890, it may be stated that up to the 31st March, 1896, the measure had been wholly or partly adopted by 698 urban authorities and 211 rural authorities, and that the aggregate population of the districts in which it had been so adopted, according to the last census, was 17,073,756.

As was to be anticipated, the disastrous bazaar fire in Paris last week evoked a long discussion at the London County Council meeting on Tuesday. Mr. Payne, the chairman of the Building Acts Committee, assured the members that a building similar to that which was destroyed in Paris could not lawfully be used for any public purpose in London. Temporary buildings in London required a license from the Council, but that was not given unless the construction and means of exit in case of panic were quite satisfactory. There was, however, at present nothing to prevent the use of any permanent building as a bazaar the contents of which were as dangerous as those in Paris, so long as no music, dancing, entertainments, or stage plays were carried on. It was unanimously decided to instruct the Theatres and Music Halls Committee to report what security is afforded by the existing law to the public against fire and panic in charitable bazaars and other similar gatherings, and if necessary to make suitable recommendations to the Council for the amendment of the law.

THE service of gold altar vessels which Mr. E. T. Hooley is to present to St. Paul's Cathedral has been on view this week at the showrooms of the designers and manufacturers, the Goldsmiths' and Silversmiths' Company, 112, Regent-street. The material is 18-carat gold, and the weight 300oz. The service consists of two flagons, four chalices, and four patens, designed in the Renaissance style prevalent in the early years of the 17th century, this being in harmony with the architecture and adornment of the cathedral; the cherub decoration on the chalices and flagons recalls the capitals of pillars and other ornamentation in the cathedral itself. The flagons are also surmounted with a model of the cross on the dome, and on the patens is the symbol "I.H.S.," with a cross in the centre, and encircled with a wreath of thorns.

THE National Gallery of Scotland at Edinburgh was reopened on Monday after having undergone, at the instance of the Board of Manufactures, a complete renovation and rearrangement, and re-classification of the pictures. The old green carpet, which was a great collector of dust, has been abolished, and the floor laid with oak parquet on a layer of concrete; a black moulded skirting has been carried up to a height of 26in., and the walls have been covered with a flock pattern paper painted Venetian red. The heavy cornice has been modified and painted a light chocolate, and the coving of the windows has been done in a cerulean blue, with bands of gold, red, and white. The well-like window openings of each room have been ceiled over with opaque glass set in strong iron frames, giving a soft diffusion of light, and also tending to keep out dust and smoke. In the middle of each window-frame is an electric fan, worked from a motor in the entrance-hall; the heating apparatus has been improved, so that now an equable temperature can be maintained both in summer and winter of about 55°. The gas lighting has been altogether abolished, and in the meantime no artificial means of lighting the galleries has



been introduced. Hot air is admitted to the galleries from the piping underneath by means of circular brass grills set in the parquet in square polished grey marble panels. These structural improvements have been effected on the advice of Dr. Rowand Anderson, the architect to the board. The pictures have been rearranged by Sir George Reid and Mr. J. R. Findlay, assisted by the curator, Mr. Robert Gibb, and the number hung has been reduced by about one hundred. Some works which are doubtful or even spurious have been withdrawn, as well as a few decaying examples. Several portraits have been transferred to the Scottish Portrait Gallery, and the others will be formed into a loan collection, which will be available for provincial galleries. New arrangements have been made for the exhibition of the diploma works of the members of the Royal Scottish Academy.

The second of a course of three lectures on "The Greek Theatre according to Recent Discoveries" was given by J. P. Mahaffy at the Royal Institution on Saturday. A closer examination of the remains of the Athenian theatre discovered in 1862 was entered upon, and the evidences which they afforded of various ages explained. Describing the simple, rude theatre in which the great masterpieces of Æschylus, Sophocles, and Euripides were performed, the lecturer remarked that the spectators sat in rising tiers on wooden benches; they had no protection from the sun or rain; the actors and chorus played below them on the orchestra in front of a temporary wooden and painted background. It seemed natural at first sight to suppose that the actors should be in some way separated from the rest and play on a higher level. That some temporary platform was stationed in front of the scene was not impossible, but from the evidence now accumulating very improbable. There were many good reasons for assuming that there was an altar in the centre of the orchestra, and that the earliest actors had the altar steps from which to speak. The construction of all Greek theatres, seating spectators round more than a half circle, implied that the main point of interest was not at the chord joining the end of the horseshoe, where a stage might be expected, but well in front of this and on the east of the orchestra. The theatre at Athens was not merely enlarged or improved; it was wholly rebuilt during the fourth century B.C.

The Bill passed last session granted the City and South London Railway Company the right to build their new station beneath the church of St. Mary Woolnoth, and imposed upon the company the condition that the church should be preserved. Sir Benjamin Baker having pronounced favourably upon the possibility of preserving the church, the railway company a short while ago applied to the Board of Trade for the appointment of a surveyor under the Lands Clauses Acts, and Mr. J. W. Penfold, who was nominated by the Board, has accordingly made a valuation of the property. The railway company have now paid into court this amount, and were, therefore, able to take possession on Tuesday last. They will proceed at once with their operations. Over two years will be required for the excavations and the building of the underground station, during which time the church will necessarily remain closed. The question of the price to be finally paid by the railway company for the right of building the station and the use of the church will be referred to arbitration.

SCENES which would have disgraced a London vestry occurred at the last meeting of the town council of Dundee, arising out of the letting of contracts for underpinning the Albert Institute. It appeared that seven builders had been asked to offer for the work, that three of them replied, and that the contract was given to Mr. Robert Sheach, who was not the lowest offerer. Mr. Sheach now wrote withdrawing from the contract. Ex-Bailie Perrie proposed that the work be given to Messrs. D. and A. Powrie, who were the lowest offerers. Bailie Robertson complained of a mean and contemptible breach of honour on the part of two members of the committee, who went direct from the committee to one of the contractors—namely, the Messrs. Powrie—and gave information of the nature and character of the business transacted at the committee. Their action, he said, was reprehensible in the extreme. He thought it necessary to explain that the Messrs. Powrie were not asked to offer for the work; and that the decision of the committee to give the work to Mr. Sheach was regulated very

largely by the fact that the city architect and ex-Provost Brownlee, a man of great experience, had expressed the opinion that the council did not have information sufficient about the ability of the Messrs. Powrie to perform such work to justify them giving the contract to them, even supposing they were the lowest offerers. Ex-Provost Brownlee undertook all responsibility for expressing the opinion that the Messrs. Powrie should be left out of this work, and he was sorry they had been so badly advised as to issue a circular to members of the council, in which Mr. Powrie grossly insulted Mr. Alexander, their architect. Other members, including the convener of the works committee, spoke in favour of the Messrs. Powrie. An amendment that the whole question be remitted back to the committee for consideration was carried by 16 votes to 11.

A JOHANNESBURG merchant, says the *African Critic*, recently had a consignment of cement forwarded from London to the Golden City, and here is his bill for the same:—Cost f.o.b. London, £82 0s. 11d.; sea freight, £83 3s. 2d.; coast charges, £13 9s. 8d.; railrage, £385; duty, £187 7s. 8d.; insurance, &c., £3 1s. 11d.; total, £754 3s. 4d. Just imagine having to pay £572 7s. 8d. railway carriage and duty for an article, the original cost of which was £82 0s. 11d.! No wonder cement, like most other articles, is an expensive luxury in the Transvaal.

THE ninth annual meeting of the registered plumbers of the Edinburgh and East of Scotland district was held on Friday night in the hall of the Philosophical Institution, Edinburgh, Sir James Russell, president, in the chair. The council's report showed that 62 masters and 54 journeymen were added to the roll during the year. The chairman, in moving the adoption of the report, spoke of the necessity that existed for impressing upon the public the fact that there was such a thing as a registered plumber. The very fact, he said, that he was registered showed that he was a competent man, and was a guarantee to the public that good work would be done. An outside man might be as good a workman, but he did not offer these guarantees. As to the Plumbers' Registration Bill, there never was a time, he said, when there was a better hope of that Bill passing into law. When it did pass, that Bill would effect a very great change in the situation. They did not want to coerce any one to become registered. Mr. J. W. Wilson seconded, and the report was adopted. A long discussion afterwards took place on the rules of the association, and several alterations were suggested, and the meeting was adjourned till the 3rd of June. The following office-bearers were elected:—President, Sir James Russell; vice-president, Mr. John Adams; secretary, Mr. James Thomson; and treasurer, Mr. Andrew Harkness.

A NEW filter, called the "Sterilite" filter, has been designed by Dr. W. H. Barr, F.C.S., Medical Officer of Health, Bury, Lancashire, to supersede and supplant the fragile and slow-flowing earthenware filtering cylinders made of baked fossil earth or kiolin. This is done by fitting a perforated cylinder covered with specially-prepared paper-cloth into an outer pressure-proof metal case. On the surface of the paper-cloth straining bed is thrown automatically, by the force and direction of the water-supply, a fine, smooth, even surface of "sterilite," which consists of mixtures of agalite, silica, and other purifying and sterilising earthenware clays, which is put into the bottom of the clean outer case previous to starting the filtering process, the result being, we are told, that all mineral and solid matter, including vegetable slimes, previously held in suspension, are instantly arrested, and remain on the surface of the superimposed bed of porous earths, and accumulate so long as the filter continues to work, and assist in the process of filtration up to that point, giving a copious and free flow of bright, sparkling, and pure water. The manufacturers are the Sterilite Filter Co., 76, Queen's-road, Bayswater, London.

Plans are at present before Paisley Dean of Guild Court of a new Volunteer Drill Hall, to be built on the site of the old establishment at an estimated cost of £8,000. The hall proper is 130ft. by 80ft., and the building will also contain a reading-room, a billiard-room, committee-rooms, armoury, and every convenience and accommodation for both officers and men.

## MEETINGS FOR THE ENSUING WEEK.

- SATURDAY (To-morrow).**—St. Paul's Ecclesiological Society. Visit to the Charterhouse. 3.30 p.m.  
London and Provincial Builder Foremen's Association. Visit to the Metropolitan Asylums Boards' new hospital, Hither Green. Trains from Charing Cross, 3.17 p.m.; or St. Paul's, 2.46 p.m.
- MONDAY.**—Society of Arts. "Design in Lettering," Cantor Lecture No. 5, by Lewis F. Day. 8 p.m.  
Royal Institute of British Architects. "The Parthenon and the Earthquake of 1694," by F. C. Penrose, F.R.S., Past-President. 8 p.m.
- WEDNESDAY.**—Society of Arts. "London Water Supply," by Dr. Percy F. Frankland, F.R.S. 8 p.m.  
Edinburgh Architectural Society. Lecture by D. McLeod Clark. 8 p.m.
- THURSDAY.**—Home Arts and Industries Association. Opening Ceremony at the Royal Albert Hall. 2.30 p.m.
- FRIDAY.**—Architectural Association. "Plumbing and Sanitary Work," by S. S. Hellyer. 7.30 p.m.
- SATURDAY.**—Edinburgh Architectural Association. Visit to the Burns and to Midhope. Northern Architectural Association. Visit to Castle Eden.

## CHIPS.

Lord Tollemache, of Helmingham, has undertaken to defray the cost of restoring the chancel of Acton Church, Nantwich. The cost will be £1,500.

On the occasion of the twenty-fifth anniversary of the foundation of the Société Centrale d'Architecture of Belgium a congress will be held in Brussels, in connection with the International Exhibition, from the 28th August to the 2nd September.

As we anticipated last week, Mr. Samuel Green, F.S.I., auctioneer and surveyor, of St. Swithin's-lane, was on Monday elected, without opposition, Alderman of Walbrook, in succession to Sir James Clarke Lawrence, Bart., who, after 37 years' service, has accepted the sinecure Aldermanship of Bridge Without.

The Hastings Town Council have decided to purchase the local electric light company's works as a going concern. The price to be paid is £53,000.

Clacton-on-Sea Urban District Council have resolved to give notice to the local water company that they are willing to purchase the undertaking.

The Hull Town Council have, by a large majority, adopted the report of the Tramways Sub-committee, which recommended the adoption of the overhead electric system, with all the apparatus and appliances, and the repavement of the main roads of the borough, the total cost being estimated at £235,000.

Col. J. T. March, R.E., has held an inquiry at Wrexham, in reference to the application of the Town Council to the Local Government Board to borrow £8,200 for the purchase of the Willow Brewery premises for public baths, a gymnasium, electric-light station depot, and other purposes.

An appeal has been issued on behalf of the restoration fund of St. Mary's Church, Birmingham. This building was originally included in the Birmingham Churches Bill. The vicar and most of the congregation were in favour of its inclusion, but in deference to the outcry of a number of outside persons it was ultimately left out of the Bill. Those who objected to its removal have now the opportunity of showing the sincerity of their interest by subscribing towards the fund for putting it in repair. At present a good deal of the structure is in a dilapidated state, and the necessary work will not cost less than £1,500.

Mr. J. W. Richford, of Wells-on-Sea, who was appointed by the town council of Christchurch, Hants, to fill the vacant office of borough surveyor, has declined the appointment. The town council met again last week to consider the situation, and unanimously elected Mr. Stanfeld Brun, of Arundel, to the office.

An inquiry was held at Sevenoaks on Wednesday week, before Col. A. G. Durnford, a Local Government Board inspector, into the application made by the Urban District Council for permission to raise the sum of £1,800 for street improvements and sewerage in Linden-chase and Mount Harry-road.

The case regarding the alleged pollution of the river Tay at Aberfeldy came before Sheriff Grahame at Perth on Friday. The sheriff had remitted to Mr. W. R. Copeland, C.E., Glasgow, to report as to the best means of purifying the Aberfeldy sewage so as to obviate any pollution of the river. Mr. Copeland has now reported. He proposes the formation of filtration beds for the reception of the sewage. The estimated cost is £1,540. By the order of the sheriff the Aberfeldy Commissioners have to carry out this scheme within nine months.



## LIST OF COMPETITIONS OPEN.

Tonbridge—Technical Institute and Free Library (£1,000 limit)	30gs., 20gs., 10gs.	A. H. Neve, jun., Clerk U.D.C., 83, High-street, Tonbridge	May 15
Morecambe—Hotel Metropole	£100 (merged), £50, £25, and £15	Baxter and Abbott, Back-crescent, Morecambe	June 16
Elne, France—Water Supply Scheme (3,300 inhabitants)	50gs., 30gs., 20gs.	La Marie, Elne, Pyrénées Orientales	July 1
Bootle—Technical School, Balliol-road (£15,000 limit)	£100, £50, £25	J. A. Crowther, Borough Engineer, Bootle	" 31
Carlton, Victoria—Children's Hospital	50gs. (merged in 5 p.c.), 20gs., 10gs.	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Wandsworth Workhouse Infirmary—Nurses' Home	No premium offered	A. N. Henderson, Clerk to Grdms., St. John's-hill, New Wandsworth	"
Chesterfield—Brewery-street Board School (360 places)	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield	"
Bexhill-on-Sea—Drinking-fountain & Dog-trough (£200 limit)	No premium offered	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill	"
Burnley—Fountain, Queen's Park (£500 limit)	£10, £5	G. H. Pickles, Borough Surveyor, Burnley	"
Bury, Lancs—Art Gallery and Free Library	£25, £10	The Town Clerk, Bury, Lancs	"
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit)		Borough Surveyor, Salter Gate, Chesterfield	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

Dufftown—Houses at Glendullan Distillery	Brightside Co-operative Society	Charles C. Doig, Architect, Elgin	May 15
Sheffield—Saleshops, Owlcr-lane		Henry Webster, Architect, 86, Queen-street, Sheffield	" 15
Rowley Regis—School		J. W. Cornwell, Bullfield Farm, Rowley Regis	" 15
Harting—School Enlargement		R. C. Blackwell, Down-place, South Harting, Petersfield	" 15
Clayton-le-Moors—Thirteen Houses	Co-operative Society	The Directors of Society, Clayton-le-Moors	" 15
Bridgend—Town Hall Alterations	Town Hall Trustees	Lambert and Rees, Architects, Bridgend, Glam	" 15
Barnsley—Eight Dwelling Houses, Gold-street		Wade and Turner, Architects, 10, Pitt-street, Barnsley	" 15
Beeston—Additions to Church Sunday Schools		Richard Wood, Architect, 3, Park-lane, Leeds	" 15
Cullen, Banffshire—House, North Castle-street	Alex Runcie	Jas. Perry, Architect, Buckie, N.B.	" 15
Alveston—Commemorative Parish Hall	Committee	F. Bligh Bond, F.R.I.B.A., Corn-street, Bristol	" 15
Rothie-Norman—Farm Steading		C. and P. H. Chalmers, 18, Golden-square, Aberdeen	" 15
Pontefract—Grand Stands	Pontefract Show Committee	C. W. Conder, Secretary, Ropergate, Pontefract	" 15
Londonderry—Dwelling House, Argyll-street	T. M'Knight	T. Johnston, Architect, 11, East-wall, Derry	" 15
Pontycaes—Two Houses		Wm. Jones, Herber Deg, Pontycaes	" 15
Colton, Yorks—Mission Church	Chas. Freville Surtees	G. M. Lawson-Smith, Colton Lodge, Tadcaster	" 15
Mainsforth and Ferryhill—Farm Buildings		F. H. Livesey, Architect, Market-place, Bishop Auckland	" 15
Aske, Yorks—Entrance Lodge		Clark and Moscrop, Architects, Darlington	" 15
Askern—Board Schools and Master's House		Athron and Beck, Architects, Dolphin Chambers, Doncaster	" 15
Batley—Eight Terrace Houses, East Bath-street	John Livingstone	John H. Brearley, Architect, Hanover-street, Batley	" 17
Middlesbrough—Three Houses, Clareville-road	Miss H. Garlick	J. Mitchell Bottomley, Architect, Middlesbrough	" 17
Pontefract—Two Cottages, Monkhill-lane	Corporation	Wm. Hurst, Architect, Pontefract	" 17
Cardiff—Docks Branch Free Library		W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff	" 17
Rallou, Ulster—Additions, Presbyterian Church	Gas Co.	Rev. E. Gillfillan, the Manse, Rallou, Larnie	" 17
Cromer—Boiler and Exhauster House	District School Managers	Percy Griffiths, A.M.I.C.E., 55, Parliament-street, S.W.	" 17
Cronhill—School Infirmary	Rev. J. Baker	Edgar Kempson, Clerk, 121, West-street, Fareham	" 17
Cardiff—Completion St. Catherine's Church	Trustees	G. E. Halliday, Architect, 14, High-street, Cardiff	" 17
Cardiff—Albany-road Wesleyan Chapel	Working Men's Building Club	Jones, Richards, and Budgen, Architects, 13, St. Mary-st., Cardiff	" 17
New Tredegar, Mon.—33 Houses on the Cwmsidlog Farm	T. Hartley	Wm. Jenkins, Elliot Offices, New Tredegar	" 17
Armathwaite and Bassenthwaite—Two Cottages	Corporation	George Watson and Son, Architects, 3, St. Andrew's-place, Penrith	" 17
Birkenhead—Wing to Holt School of Science and Art	Harry H. Hall and Co.	Alfred Gill, Town Clerk, Birkenhead	" 17
Guisley, Yorks—Stabling for 12 Horses	Guildhall Clubs Co.	Harold Chippindale, Architect, Guiseley	" 17
Newbury—Billiard-room, Bath-rooms, &c.	Roumanian Government	W. H. Bell, Architect, Market-place, Newbury	" 18
Jassy—Industrial School		Ministry of Agriculture, Bucharest	" 18
Holdsword—Barn and Mista		Medley Hall, Architect, 23, Northgate-street, Halifax	" 18
Huntley—Morrison Wing, Scott's Hospital		A. Marshall Mackenzie, Architect, 1, Bon Accord-street, Aberdeen	" 18
Halifax—Additions to Shaw Lodge	Wilts County Council	W. C. Williams, Architect, 29, Southgate, Halifax	" 18
Devises—Recreation Room Asylum	Grays Thurroch School Board	C. S. Adye, M.S.A., County Surveyor, Trowbridge	" 18
Grays, Essex—Bridge-road School	Standing Joint Committee	C. M. Shiner, A.R.I.B.A., 2, Walbrook, E.C.	" 18
Shoreham—Two Dwelling Houses and Shops		W. H. Harker, Shoreham, Sussex	" 18
Poulton—Police Station		Henry Littler, Architect, 21, Pitt-street, Preston	" 18
Outlane—House in New Hey-road	Blaydon Co-operative Society	J. Berry, Architect, 9, Queen-street, Huddersfield	" 18
Prudhoe-on-Tyne—Twenty-three Houses	Messrs. Williamson	Secretary, Blaydon-on-Tyne	" 18
Redruth—Premises, Higher Fore-street, Redruth		Sampson Hill, Architect, Green-lane, Redruth	" 18
Old Charlton—Conservative Club		John Rowland, M.S.A., 24, The Village, Old Charlton	" 18
Roths—House, High-street	School Board	Owner, 10, Seaford-square, Roths	" 19
Highley, Salop—School	Corporation	R. Scrivener and Sons, Architects, Hanley	" 19
Little Trewigie, Probus—Farm Buildings	J. M. Rope	Geo. Gow, Tregothnan Office, Truro	" 19
Middleton—Raising Gasworks Roof	Guildford Gaslight Company	T. Duxbury, Gas Manager, Middleton	" 19
Great Youldon—Farm Buildings	North Dublin Union	Thos. Jones, Architect, 6, Western Villas, Crediton	" 19
Guildford—Gasworks Buildings		William Tittle, Secretary, Gas Offices, Guildford	" 19
Dublin—Additions to Workhouse Kitchen		John O'Neill, Clerk, North Brunswick-street, Dublin	" 19
Londonderry—Five Houses	Batley Co-operative Society, Ltd.	Wm. Barker, Architect, 25, Orchard-street, Londonderry	" 19
Batley—Stores, Purlwell-lane, Mount Pleasant		W. H. Childe, Central Stores, Batley	" 20
Dewsbury—Six Terrace Houses, Savile-road	St. Olave's Board of Guardians	Jno. H. Brearley, Architect, Hanover-street, Batley	" 20
Horselydown—Laundry at Workhouse, Parish-street	East Riding County Council	E. Pitts Panton, Clerk, Union Offices, Tanner-street, S.E.	" 20
Erich—Additions Police-station and Courthouse	Midland Railway Co.	A. Beaumont, County Surveyor, Beverley	" 20
Child's Hill Station—Waiting-room and Footbridge	Midland Railway Co.	Jas. Williams, Secretary, Derby	" 20
St. Pancras Station—Transformer Room	Midland Railway Co.	Jas. Williams, Secretary, Derby	" 20
Sharpness—Foundations for 46ft. Turntable	Midland Railway Co.	Jas. Williams, Secretary, Derby	" 20
Swinton—Goods Shed in Timber	School Board	F. Winterbotham, Clerk, Stroud, Glos.	" 21
Painswick—School at the Uplands	Miss Kirkby	Sheppard and Harrison, Architects, 17, Kirkgate, Newark	" 21
Skegness—Residence, South Parade, Skegness	Middlesbrough Co-op. Soc. Ltd.	John Judson and Moore, Architects, Oakworth	" 21
Oakworth—Residence at Oakworth		Walter G. Roberts, Architect, 61, Albert-road, Middlesbrough	" 21
Middlesbrough—Block of Buildings in Linthorpe-road	Aberaman Building Club	Arthur Shaw, Architect, Golcar	" 21
Golcar—Three Houses, Handel-street	W. R. Hindmarsh	G. A. Trehear, Architect, 27, Canon-street, Aberdare	" 21
Aberaman—Thirty Houses	Great Yarmouth School Board	Rev. M. Riggall, Malta House, Alford	" 21
Alford, Lincs—House	Church Extension Committee	W. Robson Hindmarsh, jun., Architect, Alnwick	" 22
Alnwick—House, Swansfield Park-road	Liberal Club	Bottle and Olley, Architects, Queen-street, Great Yarmouth	" 22
Gorleston—Alterations to Stradbroke-road Girls' School	Urban District Council	Williams and Gould, Hon. Secs., Church House, Exeter	" 22
Exeter—Emmanuel Church		John Judson and Moore, York Buildings, Cavendish-street	" 22
Keighley—Club Premises, Devonshire and Scott-streets		A. E. Stringer, Clerk, Wheelock-road, Sandbach	" 22
Sandbach—Alterations to Commons House, Sandbach		John F. Curwen, F.R.I.B.A., 51, Highgate, Kendal	" 22
Sedburgh—Alterations to National School	Stella Coal Co.	F. R. Simpson, Hedgesfield Offices, Blaydon-on-Tyne	" 22
Ryton-on-Tyne—Collier Shops and Eight Houses, Clara Vale	Brewsters, Limited	S. Wilkinson, Architect, Sowerby Bridge	" 22
Loveshulme—Council Office, Stables, &c.		T. Johnston, Architect, 11, East-wall, Derry	" 24
Hornsey—108 Workmen's Dwellings, Nightingale-lane	Commissioners for Control	T. J. Joyce, Clerk, St. Keverne	" 24
Morecambe—Brick Chimney 129ft. in height, Engine and Boiler Houses	Great Western Railway Company	John Forrest, Architect and Surveyor, 129, High-street, Forres	" 24
Balham—Branch Free Library, Ramsden-road	Llandyfdow School Board	Secretary, Board of Control, Custom House, Dublin	" 24
Rochdale—Ten Houses in Howarth Cross-street	H.M. Commissioners of Works	G. K. Mills, Secretary, Paddington Station, London	" 25
Southampton—Avenue Congregational Church	North Dublin Union	Hon. Reginald B. Brett, Secretary, 12, Whitehall-pl., London, S.W.	" 26
Shipley—Twelve Houses, Windhill Crag	Prestoral Board of Guardians	John O'Neill, Clerk, North Brunswick-street, Dublin	" 26
Shiremoor—Five Houses	Hastings U.D. School Board	F. L. Horsfall and Son, 10, Marsden-street, Manchester	" 27
Otley—Shed, Barras-lane	Urban District Council	J. H. Tendall, Clerk, 4, Bank Buildings, Hastings	" 31
Penshaw—Twenty Houses	Urban District Council	J. Ogden Hardicker, Clerk, 141, Stockport-road, Levenshulme	" 31
Tiverton-on-Avon—Schools		F. D. Askey, Clerk, Southwood-lane, Highgate	" 31
Audenshaw—Alterations, St. Stephen's Schools			"
	Urban District Council	John Bond, Surveyor, Council Offices, Morecambe	June 7
	Streatham Library Commissioners	T. Everatt, Clerk, Tate Library, Streatham	" 8
		J. Whitworth, 21, Millgate, Rochdale	"
	Industrial Society	E. T. Sims, Hon. Sec., Portwood Lawn, Southampton	"
	Co-operative Society	J. Crawshaw, Architect, 54, Otley-road, Shipley	"
	Walt and Saville	Davidson and Beadle, Architects, 93, Grange-street, Newcastle	"
	School Board	Fairbank and Wall, Architects, 3, Manor-square, Otley	"
		Owner, Rose and Crown, New Herrington Barn	"
		Silcock and Reay, Architects, Octagon Chambers, Bath	"
		J. H. Barton, Architect, 2, Guide-lane, Hooley Hill	"



## BUILDINGS—continued.

Ballinlirick, Co. Sligo—Creamery	Co-operative Dairy Society	M. Jennings, Secretary, Ballinlirick
Buckhurst Hill—Two Pairs Semi-detached Villas		— Batting, 7, John-street, Adelphi, W.C.
Leads—Eight Houses		Owner, 7, Cross Belgrave-street, Leeds
Leads—Two Semi-detached Villas, Roundhay		P. Robinson, 72, Albion-street, Leeds
Heywood—Houses, Derby-street and Wham-lane		Secretary, Millbank Brick Co., Heywood
Nottingham—Villa	T. Moody	H. Sulley, Architect, Albert Chambers, Nottingham
Guide Bridge—Alterations, Railway Hotel		J. H. Burton, Architect, Guide-lane, Holey Hill
Paisworth—Business Premises, Old-lane	Industrial Society	F. W. Dixon, Architect, Trevelyan Buildings, Manchester
Hilton, Leeds—Five Houses, and Alterations to Four Houses		J. Butler, Sunnybank House, Hilton
Hendon—Four Houses		John Jackson, Architect, Barry-street, Bradford
Hulifax—Additions, Copley Mills		A. G. Dalzell, Architect, 15, Commercial-road, Halifax
Draperstown—House		John Hutchison, Carnamoney, Draperstown
Clayton-le-Moors Clubhouse		W. Hopwood, Lower Barnes-street, Clayton-le-Moors
Bilvaier, N.B.—Ten Houses		Slute Works Office, Bilvaier
Aberystwith—Shiloh Chapel School		Hipkiss and Bassett, Architects, Terrace-road, Aberystwith
Buckhurst Hill—Two Villas		J. Batting, 7, John-street, Adelphi, W.C.
Kirton—Malting, Warehouse, and Six Cottages		Eyre and Southall, Architects, Gainsborough
Pontefract—Seven Villas		Tennant and Bagley, Architects, Pontefract
Newcastle-on-Tyne—Pulling Down 50 & 52, Northumberland-st.	Woodley and Co.	Wm. Newcombe, Architect, Pilgrim-street, Newcastle
Pontypool—House and Shop, Crane-street	South End Co-operative Society	N. M. Brown, A.R.I.B.A., Somerset-road, Newport, M.M.
Carlisle—Stores Extensions	Working Men's Co-operative Society	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle
Chilwell, Notts—Four Shops		E. R. Ridgway, M.S.A., Long Eaton
Walsall—Leather Factory		Fred. W. Cross, Architect, 2, the Bridge, Walsall
South Meistham—All Saints' Church		Henry Hall, F.R.I.B.A., 19, Doughty-street, W.C.
Ballincurra—Additions to Stores	Trustees	John H. Bennett, The Maltings, Ballincurra
Walkley—Primitive Methodist School		W. J. Taylor, Architect, 38, Bank-row, Sheffield
Smethote, Salop—Additions, National Schools	Jno. Butterworth	A. B. and W. S. Deakin, Architects, Pride Hill, Shrewsbury
Rochdale—Five Houses, Dover-street	School Board	Bamford and Brocklebank, Surveyors, 68A, Yorkshire-st., Rochdale
Nottingham—Technical Centre, Leen-side		A. H. Goodall, Architect, Market-street, Nottingham
Nelson—Seven Houses, Princess-street		R. Blakeborough, 51, Wilkinson-street, Nelson
Darlington—House, Russell-street East	A. L. Smith	Isaac Robinson, 3, Park-place, Darlington
Buckhurst Hill—Semi-detached Villas, the Drive		Edmond Egan, Architect, Loughton
Burnley—Three Shops, Yorkshire-street	Wm. Stones	Chas. Parsons, Architect, 9, Grimshaw-street, Burnley
Hobson, Co. Durham—House and Shop		T. H. Stafford, South Garesfield, Lirtz Green
Barwick-in-Elmet—Additions to Churchyard, &c.		Rev. Canon Hope, Barwick-in-Elmet
Beeston—Pair of Villas		J. Huckerby, Surveyor, 8, the City, Beeston, Notts
Acharacle, Oban—Manse		Rev. Neil McKinnon, Acharacle, N.B.
Tregony, Cornwall—Church Restoration		Rev. J. F. Reeves, Tregony Rectory, Grampound
Sleetburn—Additions to Primitive Methodist Chapel		Plummer and Burrell, Architects, Durham
Sheffield—Workshop, Saville-street		Spear and Jackson, Etna Works, Sheffield
Heaton Park, Prestwich—Conservative Club		P. D. Lodge, M.S.A., 5, Cross-street, Manchester
Pelton Fell—Shops	W. Wilson	E. Bowman, Architect, 52, Westgate-road, Newcastle
Penttyrch—Two Villas	Co-operative Society	J. Jenkins, Sunnybank House, Penttyrch, Wales
Nelson—Four Houses and Shop		Owser, 49, Fir-street, Nelson, Lancs
Middleton—Branch Stores, Higher Wood-street		F. W. Dixon, Architect, Union-street, Oldham
Manningham, Bradford—Three Houses and Shop		Fairbank and Wall, Architects, Bradford
Leith—Improvements, St. John's Church		A. and R. McCalloch, Architects, 3, Bernard-street, Leith
Leads—Factory, Cooleridge-street		J. Dickinson, Cross Fountain-street, Leeds
High Spen—13 Cottages		Secretary Consett Iron Co., Blackhill, Co. Durham
Witton Gilbert—Institute	S. Rhodes	Secretary Consett Iron Co., Blackhill, Co. Durham
Hawker—House and Stables		J. J. Milligan, Architect, 77, Baxtergate, Whitby
Dukinfield—Offices, Half-Moon-street		John Stafford, Town-lane Ropery, Dukinfield
Denaby Main—100 Large and 50 Small Cottages	Ley's Malleable Casting Co.	Colliery Offices, Denaby Main, Rotherham
Derby—Alterations to Vulcan Ironworks		E. R. Ridgway, Architect, Long Eaton
Burnley—Rebuilding Church Institute		Thos. Bell, Architect, Burnley
Belfast—Business Premises, Berry-street		W. J. Moore, Architect, Whitehall Buildings, Belfast
Sacriston—South Aisle, &c., St. Peter's Church		Oliver and Leeson, Architects, Mosley-street, Newcastle-on-Tyne
Penarth—Chimney Stack at Cement Works		The Works, Penarth
Ookbrook—Reseating of Parish Church		Rev. L. Lewis, Ookbrook Vicarage, Derbyshire
Norden—Liberal Club	Co-operative Society	S. Butterworth and Duncan, 4, South Parade, Rochdale
Newbiggin-by-Sea—Stores	Select Vestry	Davidson and Bendle, Architects, Grainger-st. W., Newcastle-on-Tyne
Knocknamuckley—Parochial Hall		Wm. J. McKeown, architect, Banbridge
Kilkeny—Cottage		C. Fowler, Surveyor, 24, Basinghall-street, Leeds
Birle, Lancs—Vicarage		Edw. Dunphy, Mount Sion, Kilkeny
Bolsover—Alteration to Two Shops in Market-place		C. H. Openshaw, Architect and Surveyor, Fleet-street, Bury
Bacup—Alterations, Thorn Inn and Butchers' Arms	John Kenyon, Ltd.	Alfred Taylor, Alma Villas, Bolsover
		Charles Parsons, Architect, 9, Grimshaw-street, Burnley

## ENGINEERING.

Clitheroe—Gas Pumps	Gas Committee	R. Barrett, Gasworks Manager, Clitheroe	May 15
Sutton Harbour—Improvements and Stone Quay	Improvement Co.	H. Masterton, 1, Buckland-street, Plymouth	15
Hinchley—Gas Plant and Apparatus	Urban District Council	Geo. Helps, Gasworks Manager, Hinchley	17
Hinchley—Gas Apparatus	Urban District Council	Chairman Gas Committee, Hinchley	17
Wispington—Repairs to Three Bridges	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Thimbleby—Repairs to Road Bridge	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Edlington—Repairs to Road Bridge	Horncastle Rural District Council	J. E. Chatterton, Clerk, Horncastle	17
Swansea—Deep-water Entrance to North Dock	Swansea Harbour Trustees	Talford Strick, Clerk, Harbour Offices, Swansea	18
Liverpool—Additions, Refuse Destructor	Corporation	Town Clerk, Municipal Buildings, Liverpool	18
Stafford—Boiler, Royal Brine Baths	Corporation	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	21
Portrane, Co. Dublin—Heating and Ventilating New Lunatic Asylum	Board of Control	G. C. Ashlin, Architect, 7, Dawson-street, Dublin	24
Tooting-grove—Heating and Water Supplies, Grove Hospital	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk-street, Strand, W.C.	26
Donegal—Water Supply for Callinboy Lough	Board of Guardians	J. L. D. Meares, C.E., Town Hall, Newry	28
Wakefield—Precipitating Tanks, &c.	City Council	R. Porter, City Engineer, Town Hall, Wakefield	29
Wakefield—Sewage Pumping Engines, &c.	City Council	R. Porter, City Engineer, Town Hall, Wakefield	29
Walsall—Gas-holder Tank (132ft. diam., 30ft. 6in. deep)	Corporation	John R. Cooper, Town Clerk, Bridge-street, Walsall	29
Ashby-de-la-Zouch—Waterworks	Urban District Council	W. A. Musson, Clerk, Ashby-de-la-Zouch	June 1
Wakefield—Electric Lighting Plant	Board of Guardians	H. Beaumont, Clerk, Union Offices, Wakefield	2
Brussels—Local Light Railways, Les Engheins to Soignies	Belgian Government	Secretary of Local Railways, 15, Rue de la Science, Brussels	6
Bulgaria—Railway from Rustchuk to Timovo	Bulgarian Government	Ministry of Public Works, Sofia	7
Witham—Gas Engine	S. Metropolitan School Managers	Clerk to Board, Brighton-road, Sutton, Surrey	—
Keswick—Strengthening Middle Beck		D. N. Pope, Land Agent, Keswick	—

## FENCING AND WALLS.

Huddersfield—Walls (1,150ft. by Sft.), Crossland Moor	Board of Guardians	J. Kirk and Sons, Architects, Huddersfield	May 16
Ess of Glenlatterach—7,000yds. of Wire Fencing		John Smith, Seafeld Estates Office, Elgin	20
Hoxton—Railing in Charles-square	Shoreditch Vestry	J. R. Dixon, Surveyor, Town Hall, Old-street, E.C.	21
Dewsbury—Boundary Wall at Westtown		Holton and Fox, Architects, Westgate, Dewsbury	—

## FURNITURE AND FITTINGS.

Hither Green, Lewisham—Park Fever Hospital	Metropolitan Asylums Board	T. D. Mann, Clerk, Norfolk-street, Strand, W.C.	May 17
Peckham-road—Gas Fittings, Art Gallery and School	Camberwell Vestry	C. W. Tagg, Vestry Clerk, Camberwell	19
Selly Oak—New Workhouse Infirmary	King's Norton Board of Guardians	E. Docker, Clerk, Selly Oak Workhouse	24

## PAINTING.

Hull—Charter House Estate Properties	Parks Committee	R. G. Smith, Agent, 1, Cogan Chambers, Hull	May 15
Stockport—Hollywood Park	Corporation	J. Atkinson, C.E., Borough Surveyor, Stockport	17
Shrewsbury—Market Interior	St. Olave's Union	W. C. Eddowes, Borough Surveyor, Shrewsbury	19
Rotherhithe—Lower-road Infirmary		E. Pitts Fenton, Clerk, Union Offices, Tanner-street, S.E.	20
Halifax—Painting Copley Mills and over 163 Cottages, &c.		A. G. Dalzell, Architect, 15, Commercial-street, Halifax	—
Morley—Peel-street Mills		S. Rhodes, Prospect House, Morley	—
Longton—All Public Buildings	Corporation	J. W. Wardle, Borough Surveyor, Longton, Staffs	—

## PAVING BLOCKS.

St. Marylebone—Swedish Wood Paving Blocks (1,800,000, 6in. by 9in. by 3in.; 700,000, 5in. by 9in. by 3in.)	Marylebone Vestry	W. H. Garbutt, Vestry Clerk, Court House, Marylebone-lane, W.	May 15
Brighton—Wood Paving in New-road and North-street	Corporation	F. J. Tillstone, Town Clerk, Brighton	23

## ROADS AND STREETS.

Braila—Paving Streets and Squares	Corporation	Mairie, Braila, Roumania	May 31
Dartford—Making-up and Paving Four Roads	Kent & Essex House Investment Co.	G. W. Cobham, Surveyor, 40, Windmill-street, Gravesend	June 2



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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FRIDAY, MAY 21, 1897.

### CORNER ARCHITECTURE.

**A**CCENTUATION is not a characteristic of our street architecture. Our great squares and street crossings have no external features to distinguish them from the miles of houses through which we travel. Except the Nelson Column, there is nothing to signify or mark even that large space we call Trafalgar-square. The Gallery on the north side, and the church of St. Martin on the east, are accidental rather than intentional in their design; but they do not mark the extent or boundaries of the square. The huge hotels and offices on the south side rather encumber than adorn the locality. And yet these buildings might all have been planned to accentuate and dignify the space; as it is, they only add to the purposelessness of the general design, and lose the importance they might themselves have achieved, had they been built to accentuate and define the area. Two kinds of accentuation are worthy of the architects' notice. One is that of marking or emphasising our street vistas where crossings occur, or the angles of our squares; the other kind is the accentuation of buildings *per se*; the former is a matter which concerns chiefly our civic authorities when plans for new streets are made;—it is the business of the London County Council: the latter appeals to every architect.

We possess many great buildings which are practically lost sight of in London unless they chance to occupy an isolated position. Their magnitude and architectural design are thrown away, by being placed in a long street, perhaps narrow, and their ends or return sides built close up to other houses, or only separated from them by very narrow passages or courts. The Government Offices in Whitehall are an example; few see these buildings from the Park, fewer admire the heavy flat-roofed masses of wearying ordinances which rear themselves against the sky. Even Scott's design was robbed of its angle features to satisfy a parsimonious Government, very much as the new Admiralty Buildings have been denuded of the architects' original features. But this is so all over London; there is a jumble and incoherence where there might have been noble symmetry and picturesque sky-line.

What more concerns us now is the arrangement of our street corners—the lack of method everywhere to be seen where demolished neighbourhoods have given the opportunity of doing something better. The terminal junctions of the new streets often appear as if no trouble had been taken to plan the approaches; the new buildings look as if they had tumbled into place as best they could after the claims of owners and the street committee's demands had been settled, the line and direction of the new street being more cared for than anything else. Several important reconstructions have lately been undertaken, but the results have been disappointing. The widening of Ludgate Hill near St. Paul's gave an opportunity to make an approach to that edifice worthy of our time; but we cannot regard the architectural *dénouement* as satisfactory. The new road northward from Trafalgar-square to Oxford-street has been a public good—a large space has been opened behind the National Gallery; but few will say that any effective *coup de main* has resulted. Still worse is the large ill-shaped area which is called Piccadilly-circus. A more chaotic and featureless junction could not be. The buildings are unhappily massed for any effective result. Leicester-square is

undergoing a transformation in the surrounding buildings. On the north side, adjoining the Empire Theatre, a large space has been cleared, and a similar site on the south side for a new Dental Hospital, and on either site the architect has an opportunity.

The junctions of Oxford-street and Tottenham Court-road, Clerkenwell-road and Rosebery-avenue, are two important centres which seem to have shared the same fate as other demolished and rebuilt places. The buildings that have been erected have not been designed with any reference to the approaches. We fail to observe in any of them any special planning of corner buildings; they are merely like other houses: the ordinary street house is continued to the corner. Instead of which, we look for a building that shall terminate the street, some sort of design that will emphasise the approach. The higgledy-piggledy is more apparent. A general setting out of frontage lines, or a "give-and-take" arrangement, would have saved many of these sites. Questions of "ancient lights" and exorbitant claims would often be better met if those contemplating new streets were first to devote their attention to these areas before anything is done in arranging a line of route, as once the street is planned and the properties scheduled, it becomes harder to deal with owners of properties occupying these positions. But this is not the routine adopted. The plan seems to be followed of allowing the frontages to work themselves out at the corners, and of disposing of the plots without any conditions as to the design of the buildings to harmonise with adjacent edifices at other corners. The feeble treatment of important angles was a point touched upon in a recent discussion on street architecture at the Architectural Association, but few suggestions of any value were made. No doubt it would be a great point if those in authority made a rule not to allow sharp or wedge-shaped corners of great acuteness. A certain minimum angle ought to be agreed to, and when two streets come together at a sharp angle, the lines of frontage, as they approach, ought to be bent inwards or terminate some distance back from the point of convergence to give the corner building a wide front. The area or space thus lost would be thrown into the roadway. The architect has, however, to take the existing streets as they are. A corner plot is always valuable, and every foot of ground is of some importance. He is called in after the streets have been formed, and his plans must therefore be made to conform with the lines of frontage. He has a three-cornered plot to deal with, or one having two main frontages and a sharp angle. The way he usually adopts is to cut off the corner forming a short canted side, or often he rounds it off, putting the main entrance in the corner. At the best it is a difficult problem. The rooms have to be made as square as possible, if they can be; or the irregularity has to be thrown into the hall or smaller rooms. And then the roof—how is it to be arranged so as to preserve level ridges, and avoid any flats or gutters? Above all, how is the corner to be dealt with? A hipped end looks poor, and a gable is often impossible, if the roofs cut at unequal angles. To get over further trouble, he thinks of turning his corner into a half-octagon, or making it circular and carrying up a turret crowned by a separate roof. This is one way of getting over the difficulty of roofing, and it also gives an emphasis to the corner, and this form of corner has been largely used of late, and the American architects have adopted it in many of their public and domestic buildings. It has been spoilt sometimes by making too much of it, and giving it a prominence and pretention that are ridiculous, such as by carrying it high above the roof-level, by dividing it into stories by separate peristyles, and by crowning it with a lofty

spire or cupola. There are two other kinds of corners—the right-angled, which is most common, and is generally the corner found in New York and other American cities, and the obtuse-angled. We everywhere meet with instances of the former; but in London, amongst other English cities, there are few attempts made to give them any importance. The two fronts meet at an angle, and each side is treated with windows or shop fronts; there is nothing to emphasise the roof—such is the ordinary corner house in our streets and suburbs. Here and there the corner is canted or treated differently, by being accentuated by a projecting tourelle or otherwise; but, as a rule, the ordinary way is to make a corner building simply like one of the row, as we see it in most of the older thoroughfares in London—Gower-street, Fleet-street, and the Strand. The new theatre in the Haymarket is an agreeable exception. When the "circus" was planned at the meeting of four or more streets, few attempts were made to amend matters, as we may see by looking at the main circuses in the Metropolis—Holborn, Ludgate-hill, the old Piccadilly-circus, St. George's-circus, and others. The ordinary elevation of houses was carried round the quadrants without any distinction as to height or treatment of roof. What can be more atrocious than the hideous irregularity seen in St. George's-circus, where a lofty eye hospital has destroyed all symmetry. The obtuse class of corners are less favourable than the right-angle class, but more capable of architectural treatment than those of the acute angle.

Of the actual recent attempts made to do anything with corners of new sites we may mention the Charing Cross-road entrance to Green-street, leading into Leicester-square, adjoining the National Portrait Gallery, where the widened side of the street is finished by an octagonal corner in red brick and stone. This octagon turret, or, rather, bay, has its cardinal faces in line with the two frontages, and therefore does not project beyond the two fronts. This is managed by commencing the octagon from a splayed face, just as an octagonal shaft is formed within the angle of the jambs. The corner entrance below is canted, and the turret, therefore, projects over it by an arrangement of the cornice—a rather clumsy way. The main roof is steep, covered by an ogival cupola. At the opposite corner of the street, the angle is a small quadrant set within the containing lines of frontage, and is finished as a circular turret with conical roof. In the French capital, the mansard roof or the domical pavilion constitutes an effective termination to a street; but we have a habit of placing these features where they are least required for accentuation—as they are in the buildings at the junction of Piccadilly and Regent-street, and where there is nothing at the corners to mark the area. Each quadrant of a "circus" ought to have some distinguishing feature to mark the skyline. How very different Oxford, Holborn, and Ludgate Circuses would have been for the addition!

We now turn briefly to the second division: the accentuation of the corners of buildings regarded as an architectural feature, and here we must go to foreign cities for our inspiration. To the cities of France, Belgium, and Germany we must look for the treatment of the corner. The Chateau de Chambord is a noble instance of angle accentuation, and really combines the fortress of the 15th century with the modern palace of the time of Francis I. We have our imitations of this palace—one may be seen in Barry's work on the Victoria Embankment; but how very seldom it is made a satisfactory feature! Mr. Waterhouse's polygonal-shaped tower at the acute corner of his Liberal Club House in Northumberland Avenue, facing the



Embankment, is one of the most conspicuous features; and the corner turret or tourelle has been cleverly adapted by Mr. E. Norman Shaws in his New Scotland Yard building, and also in his new offices, Liverpool, for the White Star Company, which in some features resemble the former. The projecting angle turrets are carried on corbels on both faces on the second-floor level, and terminate in ogival-shaped cupolas above the eaves level, and flank picturesquely the gabled ends. In a few provincial towns—Manchester and Liverpool—examples of corner treatment may be met with. The Manchester Trust Building has an octagonal turret. In the Adelphi Bank, Liverpool, Mr. Caröe has a canted corner entrance, and a deep corbelling supporting an octagon corner, with an ogee roof in line with main ridge, and in the new Oxford Municipal Building Mr. H. T. Hare has a pleasing corbelled turret. In Westminster Bridge-road a recent building, the Dover Castle, has a corbelled octagonal turret carried up to ridge-level, and crowned by a flat curved roof, which is treated with some success, and we must notice the important block of baths and washhouses in Kennington-road, designed by Mr. Hessel Tiltman, which is emphasised boldly at the corner by a square tower and octagon above the roof. The endeavour to change the shape of the turret from circular to octagonal is not happy. Angle or corner accentuation is a feature which has been neglected—but why?

We see many new buildings in Cornhill, Broad-street, Cheapside, Oxford-street, and the West End in which the corner has been dealt with; but they generally fail from attempting too much, by raising the turret too high, or by a want of coherence. The attempt to make the turret or bay too ornamental, or to crown it by a roof that ill agrees with the main lines of the building, is often the cause of failure.

#### PICTURES AT THE ROYAL ACADEMY. IV.

MANY disappointing and mediocre pictures occupy valuable space in the galleries, and as usual portraits are redundant and obtrusively hung. We may here mention a few instances. To take the large Gallery III.—whatever could have induced the hanging committee to have hung such commonplace subjects as "Poor Tom's a Cold" (211), or such portraits as Nos. 213 or even 218. The latter is a large full-length portrait of a lady in light blue evening dress leaning on a Louis XV. mantelpiece, very tawdry in colour, and it occupies a very important position. We can only think it was the subject of the picture, not its merit, that gave it this prominence. The lady herself is graceful in attitude and elegant in attire, but the background is treated in a bizarre style; the elaboration of the rococo mantelpiece and ornamental accessories are painfully overdone and distracting. Quietness and breadth are the only conditions of a satisfactory background. In Mr. John S. Sergeant's portrait of Mrs. Carl Meyer, these have been attained by a breadth of handling, and the subdued tones, despite the richness of the tapestry and accompaniments. The large landscape of Frederick Goodall in Gallery VII., "Eton from the Royal Library, Windsor Castle" (560), is exceedingly tame, and lacks vigour and strength in the foreground. It shows the cricket-field of the town of Windsor. Near it is a large figure subject by C. E. Perugini, "A Fan Maker," graceful in composition and harmonious in colour, but somewhat weak and flat in handling. Charles W. Furze is a masterly painter of foxhounds, and his portraits of two masters with their foxhounds (558 and 563) may be of interest to a few. Many other pictures, weak in sentiment or handling, may be noticed in

the preceding galleries—such, for instance, as No. 325, "For the Coming Event," or No. 322, "Fair Deceivers"; but we pass on in our review.

G. Sheridan Knowles, in "Glasgerion" (620, Gallery VII.), has practically conceived the theme of the youthful and impassioned harpist, who has harped the company to sleep except the young "princess, whom love did waking keep." The young couple are seen sitting together in the foreground of the banquet-room, the other guests lulled to sleep. The drawing and colour are in admirable keeping and harmony with the subject.

"Steady the Drums and Fifes!" by Lady Butler, in the central position of Gallery VIII., is a cleverly-painted battle-scene. The lady painter has shown the 57th ("Die-hards") drawn up on the ridge of Albuera under fire, and the quotation from Cardinal Manning as to the courage of the soldier in standing still under fire is very admirably illustrated in this picture. The technical qualities, the massing of the regiment, their arms and accoutrements, and the deadly havoc the fire is making among the ranks, are depicted with masterly knowledge.

In Gallery IX. are to be seen a few small pictures, none the less important because of their size. Alfred Waterhouse's "Bam-borough Castle" is broad and effective. No. 750, "Père et Fils," by Christabel A. Cockerell, is charming in composition and colour, the light through the window clever. Probably one of the most pleasing works in the room is Stanhope A. Forbes's "A Red-Room in Holland" (768), delightful in colour. The tones of red and grey make a pleasing combination, and this picture is decidedly the best work of the painter as regards artistic qualities, breadth, light, and colour. Near it hangs L. Alma-Tadema's dainty picture, "Her eyes are with her thoughts, and they are far away." In this little work the artist fully sustains his reputation for delicate subtle colour and technical beauty in the marbles and draperies. The scene represents a colonnaded terrace by the sea, the marble of which is as translucent and the mouldings of base as delicate and finished as ever. The sea is also of the intense blueness which gives lustre and beauty to the transparent marble, and the reflected light beyond on the distant cliffs. Looking wistfully over the sunlit sea, a damsel is seated, leaning over the balustrade, shading her fair face from the intense sun. The young maiden's eyes are "far away"; she has bidden adieu to her lover, or is thinking of some one in pensive mood. Nothing can excel the charm of touch and tone, the modelled draperies, the carved seat, and the jewelry of the fair sitter; but a note of brilliancy is given to the work by the rich blossom of the azalea which has been introduced on the terrace, and reminds us of another similar work. The details and minute finish of the receding cliffs beyond the sea, the little town, and the road which climbs the hill are remarkable, as if every little point was made a subject of careful study.

As a study of *genre* we have few pictures that come up to Marie Dueñe's "An Evening at Home," a large family of boys and girls—some engaged at their school lessons, others playing cards; the elder members seated, and a listless one is yawning near the piano. In each group the painter has given us a touch of character, and there is also humour. Last week we mentioned Eyre Crowe's "Trial for Bigamy" (580), and we mentioned its hardness. A further study reveals undoubted cleverness in the characters, especially the interested witnesses—the young wife with child in her arms, and the second wife who is sobbing in the front part of court; the sympathetic friend near; the undecided jurymen; and the differing emotions seen in the faces of the public. There is satire and humour as well in the

piece, despite its want of colour and harmony. Mr. Crowe's other subject is equally telling; (815) "The Gipsy's Rest" is of a pitiful kind—a poor worn-out horse is lying down on a common, where he has at length found rest, while two groups of gipsies, unconcerned, are cooking. There is a sympathetic feeling in the work. Harmonious in tone is Tom Griffiths' "Feeding the Calves" (730); and the grey landscape and houses (776) by Fred H. A. Parker, and Henry Harwood's landscape, "The Pasture" (713), are both clever. As a study of colour and movement is G. Clausen's clever subject, "Autumn Morning: Ploughing" (790). The perspective of the horses, considerably foreshortened, drawing the plough, with the man behind, is admirable, and the atmosphere and colour equally charming. Miriam L. Davis's "The Bridal Dress" is pleasing; but G. A. Storey's "Summer Days," and No. 893, "Summer Reverie," are somewhat feeble in motive.

A great many mediocre works are hung in Gallery X. *Genre* and portraiture abound. Weak in colour is Sigismund Goetz's portrait of a child and her dog (933). T. B. Kennington has a large subject, "Maternity," a young convalescent mother and her child reclining on a bamboo chair or settee, careful in drawing, but not quite up to expectation. Ernest Normand's large centre Oriental scene, "Rivals," a harem full of fair and dark women, looks like the open court of a palace, where they sit and recline in various positions. The painter has given us a brilliant scene, full of strong sunlight, but on the whole too garish. A feebleness in the tones is apparent. George Hitchcock's "St. George" (954) is strong and brilliantly painted. The figure of the valiant knight on his steed is seen through branches of spreading trees on the distant side of hill. Gleams of sunlight flickering on the hillside, and the sitting figure of the mythic king's daughter with a coronet on her head under a large tree, clad in a rich embroidered violet robe, make up a wonderful scene over which the painter seems to throw the glamour of the mystic legend. As a piece of strong vivid colour alone, the picture has claims. An ambitious canvas is A. Chevallier Tayler's "Cantus Evangelii" (957), an altar scene in a Roman Catholic church, the priests vested in their scarlet chasubles; a young priest is intoning the Gospel from a lectern, with acolytes holding lighted candles, and flanked by a huge seven-branched candlestick. The red cassocks and altar surroundings make an imposing scene. Above it is Frank Spenlove-Spenlove's large moonlight landscape, "Dawn of Night" (958). The shimmering silver light from the moon illumines a beautiful woodland, in which the dark masses of foliage stand in contrast to the light of the half-clouded sky. "The Evening Hour" (976), by John White, is a delightful evening effect—a group of white cottages by a country road reflecting the evening light, painted with much sympathy and harmony of tone. One of the best pieces of *genre* is James Hayllar's "Never too Late to Learn"—an interior of a cottage where an old man is seated at a table writing a letter, his little grandchild guiding his hand. Opposite sits an old lady, who is evidently interested in her husband's endeavours. There is a touching simplicity and pathos in the work. The light from the window is cleverly managed. "Minding the Cherries" (948), by James Charles, is another pleasing country incident. An old gamekeeper reading a newspaper in a shed covered with foliage. A large sombre-painted scene, by Charles H. M. Kerr (991), represents a churchyard at night-time, in which the solemn rite of "All Souls" is being observed. A sister of mercy and a child kneel at an outlaw's grave, outside the precincts, on which a lighted candle sheds its rays. Below it is



another large picture, a number of gentlemen seated at a table playing whist. The lamplight effect on the faces of the players is well rendered. Laslett J. Potts' "18th June, 1815," Napoleon on horseback, is rather too hard.

In Gallery XI. Ellen Clacy has a well-painted interior—a lady carrying a fish-bowl listening to the sound of footsteps. The expression of the face lit up by the firelight is well done (1000). Another clever *genre* subject is Frances Sterling's "Simultaneous Chess," a room of chess-players watching the first game. F. Graham's bright picture, "Young Crusoe Prisoner of the Salee Rover" (1015), is slight and weak in drawing and colour. An ambitious subject is by Charles Sims, called "Childhood," which hangs in the centre of one side of gallery. It represents a flowering meadow crowded with children of both sexes and all ages indulging in various pastimes and amusements, and no doubt intended to depict the various stages of childhood. Some are engaged with dolls and toys, others are flying inflated balloons. There is movement and playful mirth, and the sunlit landscape is broad and skilfully handled, for what we must take to be an allegorical subject. Frederick W. Jackson's hayfield, "The Last Load," a cartload of mown hay, is feelingly treated, and the evening light well suggested.

A large landscape by Arthur H. Buckland adorns the opposite side of gallery, "The Valley of Flowers" (1066). The sentiment embodied in this pretty romance is poetically set forth; the young suitor kneels before a queenly-looking damsel. "... She placed a crown of gold upon my head, which brought forgetfulness of all things; the world became very fair, and I longed only to sigh for ever at her feet." Mr. Buckland has pleasingly and gracefully painted the two figures amidst a wealth of rich blossom which cover the banks of the sylvan valley. The costumes of the wooing knight and maiden, Mediæval in manner, are painted with exquisite finish and delicacy, and the solidity of colour of the wooded glade assist the general effect. One of the few brilliant pictures of ordinary incident is the work of Richard W. Maddox, whose picture, "The Fruit Stall" (1082), is worthy of his former work. This time he leaves poetical legend for everyday modern life. His dark, pretty-featured fruit-girl, who sits by the side of her luxurious and dainty stall of fruit of all kinds, dressed in figured bright mauve, amidst the brilliancy of colour of the sunlit fruit is painted with much ability and vivaciousness. W. Hatherell's picture, "The Bailiff's Daughter of Islington," depicts the poet's verse admirably:—

Then all the maids of Islington went forth to sport and play.  
All but the bayliffe's daughter deare—she secretly stole awaye.

#### PROPOSED REPAIRS TO THE PARTHENON.

AT the fortnightly meeting of the Royal Institute of British Architects, held on Monday evening, the President, Professor George Aitchison, A.R.A., in the chair, Mr. F. C. Penrose, F.R.S., his immediate predecessor in the presidential office, read a paper on "The Parthenon and the Earthquake of 1894," in which he described the building as he first drew and measured it in 1846, and its appearance just fifty years later when he repeated his examinations, and gave a lucid description of the manner in which he and his French and German *confères* proposed to repair and preserve the remains of this at once the most refined, most beautiful, and most celebrated of Doric temples. The lecture was illustrated by diagrams and drawings by Mr. Penrose, by water-colour drawings executed by Mr. R. Phené Spiers, F.S.A., some thirty years ago, and by numerous photographs from various sources taken at intervals during the past five-and-thirty years.

Mr. PENROSE said he had undertaken to describe

the result of his recent examination of the Parthenon, the object of which was to advise the Greek Minister of Public Instruction and the Archaeological Society of Athens as to certain repairs which were required in consequence of the damage done to the building by the earthquake of 1894. Three international consulting architects—namely, Mr. Penrose himself, Professor Dürm (of Karlsruhe), and M. Lucien Magne (of Paris)—had been appointed to confer with a local committee, presided over by M. Cavvadias, the Government Superintendent of Antiquities, and consisting of several Greek members of the Athens Archaeological Society and some associated members, including Dr. Dörpfeld, M. Troump, a resident French architect, and the Government engineer, M. Balanos, who was to superintend the repairs. Having described the edifice itself and referred at some length to the principal events which had reduced the building to its present insecure condition, Mr. Penrose went on to say that when he arrived at Athens last year Professor Dürm and M. Magne had already made their reports. The former had gone very fully into the question of the defects and remedies, and his report was a valuable contribution to the study of the subject. That of M. Magne was a brilliant and well-illustrated memoir on the construction and ornaments of the temple rather than a more technical report on the defects and remedies; but he called attention to one very important detail which seemed to have escaped the notice of Professor Dürm—namely, the instability of the angles of the pediments. The local committee had already made arrangements for several 14ft. architrave stones to be prepared at the quarries on Mount Pentelicus. Comparing the present state of the structure as revealed by his inspections of the upper parts of the walls with his notes of similar investigations and measurements made exactly half a century earlier, the lecturer had the satisfaction of finding that no further injury had occurred to the western pediment or to the Posticum behind it. The part of the temple which demanded the most immediate attention was the hexastyle portico of this Posticum. The state of the Posticum was such that it was impossible to execute any satisfactory repair without replacing at least five of the architrave stones. Of the six columns composing the portico, four only were free; two of them were more or less imbedded in the mass of masonry containing a staircase, which was once surmounted by a Turkish minaret. This mass secured the southern columnation. The architrave supported by the four free columns consisted of twelve stones. Of these twelve, only five were free from very great defects; but if five of them could be replaced with new material, two could be so pinned together to their neighbours that they might be supported sufficiently well. The worst defects were on the eastern side of the portico. With one exception the western stones were sound, which was fortunate, as they supported the portion of the Panathenaic frieze still left on the temple. With regard to the defective one—namely, that which once connected the north-eastern column with its neighbour—the simplest remedy would have been to replace it with new; but its removal would endanger a portion of the precious sculptures, and it would have to be keyed to a new stone placed alongside of it. Professor Dürm, in his report, suggested that the reason of this part being in so much worse condition than any other was that the original builders had used for an interior part of the fabric a very much worse material than they had provided for the exterior. It was true that the marble of these architraves was more streaky than could be found on the exterior; but streaky marble of similar quality had endured well on the temple of Jupiter Olympus. Another and more effective cause could be assigned to it—namely, fire, which had consumed all the inflammable part of the structure, and had very much calined the whole of the superstructure of the Posticum, as the state of the surface of the marble showed. It had also weakened the lintel of the great western door, and some of the columns of the Posticum, especially on the eastern side, had also suffered. Many portions of the capitals and of the architrave stones in this part retained traces of iron plugs which could only have been used to fix some material for the purpose of repairing the surfaces which had been split off by the action of fire. This completely explained why the architrave stones of this portion of the building, although much less subject to ordinary weather vicissitudes,

had become so much more cracked than those of the Peristyle. A large piece from the middle intercolumniation fell down in the earthquake of 1894, split off apparently at an ancient flaw. The course of deep stones above the architrave, which formed the back of the Panathenaic frieze, and ranged with it in level, was also very much cracked and dislocated, so much so that only two pieces in the whole length were in a fit condition to be retained. These pieces, however, were neither so difficult to handle nor to replace as the main architrave stones, which had a length of about 13ft. 9in. each. The lecturer then referred to the difficulties attending the removal of the condemned blocks and fixing those which were to replace them, and showed by the aid of diagrams how the operation could be performed. With regard to the lintel of the great western door, the two ends remained in the wall, but the rest was gone, and the place was occupied by an exceedingly unsightly brick arch. This, it was hoped, would be replaced by marble; but there was not the slightest prospect of a 30ft. beam being found in the quarries of Pentelicus, nor could it be brought to Athens with existing appliances. The plan recommended by the lecturer, and accepted by the Athenian Committee, and by Mr. Penrose's French and German colleagues, was explained by a diagram. The insecure condition of the angles of the temple was to be traced to the great overhanging stones which supported the angular acroteria having a tendency to slip downwards and drag the neighbouring portions of the superstructure with them. The inclination of the cornice did not, it was true, exceed  $13\frac{1}{2}^\circ$ , which was well within the angle of repose; but the angle of repose did not allow for the vibrations due to earthquakes or explosions. The worst crack in the architrave was over the north-west angle column, where, owing to the fall of a large piece at the corner of the abacus, the bearing of the outer stone of the architrave was reduced to little more than a point. Between the fourth and fifth columns, reckoning from the south, a crack through the architrave had been produced by a cannon-shot, and the abacus of the fourth column had been so much shattered that it gave a bearing to no more than about half the thickness of the architraves which rested upon it. The exfoliation of iron cramps connecting the architrave stones at the top had also injured all but one of the vertical joints; but beyond the breakages of the large splinters which had fallen, the injury at these places did not seem likely to extend. Among the diagrams shown by the lecturer was one illustrating the curious construction of the south-west angle of the cornice, and another showing how the angles could be secured from slipping by connecting the great horizontal corner-stones by means of strong gunmetal cramps with the main cornice at a sufficient distance, so as to provide an adequate amount of weight to resist the tendency to slip. Few of the new stones proposed to be introduced would make any difference in the general view of the temple, and scarcely any of the steel or bronze work; and the new stone could be stained with copperas, so as to be almost indistinguishable from some of the old time-stained marble.

Professor ERNEST GARDNER, late of the British School at Athens, remarked that he accompanied Mr. Penrose over the Parthenon, and agreed with his conclusions, after having studied the building from all points of view over many years. The speaker was a member of the International Commission which sat six or seven years ago, which simply considered from the æsthetic point of view what was desirable in the way of restoration, and of clearing away certain modern additions. He was in Athens at the time of the earthquake in 1894, and saw the fragments directly they had fallen. The damage then occasioned was not very great; old cracks were widened, and pieces which had been hanging on were shaken down. In fact, the earthquake did good, as it called public attention to the precarious condition of much of the fabric. He should like to ask Mr. Penrose questions as to the three points—the fallen columns, the jambs of the great western door, and the foundations of the Turkish minaret. The general effect of the attempt to re-erect the fallen frusta of the columns on the north side had been disastrous; the flutings were not kept in line, the relative sizes were not observed, and he wished that Mr. Penrose would recommend that they should be again pulled down. It was quite impossible to restore the entire Parthenon, and to replace a few columns from disjointed drums only dis-



placed a certain symmetry in the ruins produced by the explosion of 1685. Again, within the jambs of the original temple, thin blocks of stone, reducing the aperture, were erected when the building was converted into a church. These blocks were old materials, which appeared to be covered with a long inscription. It appeared to him that it would be desirable that these stones should be removed in order that the inscriptions might be read and copied. As to the lower part of the old Turkish minaret which still remained, he was opposed to its removal, as it filled up the western part of the opisthodomos, and afforded much support at that point. Not only, then, would it be wrong to remove these ruins from an historical point of view; it would also be imprudent from the standpoint of structural stability.

Mr. R. PHENE SPIERS said the most recent photographs showed very little alteration in the ruins of the Parthenon from their aspect thirty years ago, when he proceeded to measure and plot on the spot. Comparing his drawings with the latest photographs, he noticed that the crack at the north-east angle had widened, and more material had crumbled from the abaci of the columns. He should like to know what was the cause of the discoloration of portions of the marble—was it due to ironmould, growth of lichen, or decay of the material? He believed all scholars and architects felt the utmost confidence in Mr. Penrose's judgment and recommendations, but personally he objected to the proposal to discolour the new stones; the masonry should be put up in its natural condition, and then, if it was found to be unduly prominent, stains might possibly be applied.

Mr. T. J. WILLSON said that more than 50 years ago he accompanied Mr. Penrose in his measurement of the Parthenon, and he congratulated him on having been able to carry out the present inquiry and make the report, in which he concurred. It was satisfactory to learn that the damage caused by the earthquake was not so serious as had been at first supposed.

Mr. JOHN HEBB was glad to hear that Mr. Penrose's suggestions were confined to repairing, and did not propose to restore the Parthenon. Nothing could be better than his suggestion for securing the western pediment. The only result of setting up the scattered ruins of the fallen columns would be to injure the general effect. He would ask why should not some other material than Pentelic marble be employed for the repairs. For himself, he did not object to the brick arch or even the ironwork erected in the western doorway, as those materials plainly showed that they were mere repairs, and not part of the original temple. He should feel great diffidence in staining the fresh marble to imitate the old work; if left alone Nature would soon colour the new material in harmony with the landscape. In all respects he cordially concurred in Mr. Penrose's suggestions as to the way in which the repairs should be carried out.

Mr. HUGH STANNUS asked why this proposed restoration should not be carried two steps further. He would, in the first place, suggest that the upper surfaces of the walls should be coated with cement, so as to protect them from soakage, and arrangements should be made for a periodical examination of the walls to detect and fill up cracks as early as possible, and to remove all herbage before the roots extended. He would not only keep up the columns which had already been re-erected, but he would go further, and set up some of the scattered frusta which now littered the platform. In dealing with the Parthenon, the question was not what Mr. Hebb or the Anti-Serpape Society would think of it, but what Ictinos, if now living, would wish done. He would go even further, and would reconstruct the cella wall now broken down, so as to unite the two isolated fragments into a solid mass, and once more restore the long, unbroken horizontal lines as projected against the sky when the Acropolis was seen from the city beneath. Stay-ropes of gunmetal should also be carried to every capital, so as to tie the whole building together.

Mr. ALEXANDER PAYNE deprecated any proposal to re-erect the jagged, broken, and ill-fitting frusta of the columns. He had been comparing his photograph of twelve years ago with Mr. Penrose's drawings of the west portico, and could see that the masonry had suffered further injury, especially in the abaci of certain columns.

Mr. J. M. BRYDON asked how much of the Panathenaic frieze remained. It was a difficult problem, which perhaps Mr. Penrose would

solve, why the Greeks expended so much thought, time, and skill on a frieze which was so imperfectly seen. It had been suggested that the original design had been altered during execution, as was shown by the fact that the cella walls and the east and west porticoes were not quite in line.

The PRESIDENT, in closing the discussion, said he thought it would be well if the walls and also the interior of the temple could be protected from torrential rains and occasional frosts.

Mr. PENROSE, in the course of his reply, said he should regret the removal of the inner lining of the west doorway, as it was part of the history of the building, but there could be no objection to taking out the slabs one by one and copying any inscriptions that might appear upon them if they were afterwards replaced. Very little of the new masonry would be visible from without; with the exception of that in the western lintel, it would chiefly be seen from the inside. He proposed to stain it, as the marble was almost insupportably bright in the bright sunshine of Athens, and it should be remembered that the old marble was coloured. The yellow discoloration, however, was due to the iron in the material, which was oxidised by exposure. The best material for repairs was the Pentelic marble, which harmonised with the old work, and was obtainable in the locality. As to the cracks, he did not find any change between 1846 and 1896; but some of the above were more injured. He was opposed to re-erecting any further columns. As to the Panathenaic frieze, a very small return could be seen on the south side, and it was carried as far as the fifth column of the hexastyle columns of the Posticum. These fragments might, he thought, be protected under glass.

A vote of thanks to the lecturer closed the proceedings.

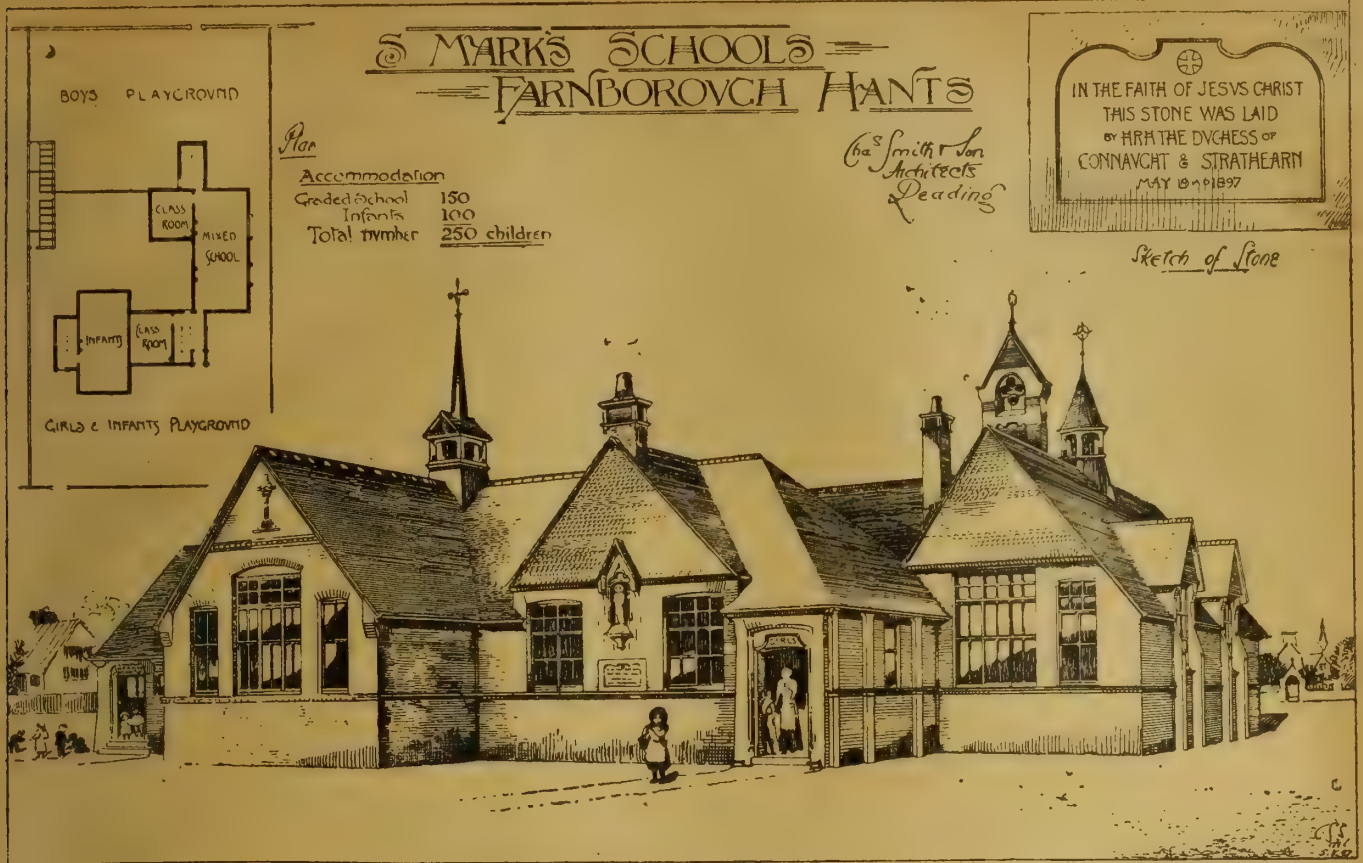
#### DR. ROWAND ANDERSON ON REGISTRATION FOR ARCHITECTS AND PLUMBERS.

THE annual general meeting of the Edinburgh Architectural Association was held on Wednesday night in last week in the Royal Institution, The Mound, Edinburgh. Dr. Rowand Anderson, the retiring president, in the chair. Office-bearers were elected for the forthcoming year as follows:—President, Mr. Thomas Ross, F.S.A., Scot.; vice-presidents, Mr. John Watson, architect, and Mr. James Bruce, W.S.; hon. secretary, Mr. T. Fairbairn; hon. excursion and syllabus secretary, Mr. A. Hunter Crawford, architect; treasurer, Mr. John Johnston, C.A.; and members of council, Messrs. J. A. Carfrae, J. D. Cairns, the Rev. P. M. Herford, David Robertson, A.R.S.A., William Rae Macdonald, F.F.A., and R. Morham. It was reported that at this time the membership stood at 302, which was practically the same as at the end of the year 1895-96.

Dr. Rowand Anderson then proceeded to deliver his valedictory address. When he took office two years ago, one of the questions prominently before the profession, he remarked, was that of education, combined with efforts to make their profession a close one. He explained his views fully to them then, and he had heard nothing on the other side since to lead him to think differently. At the bottom of this controversy lay a misconception of the nature of their business as compared with the professions of divinity, law, and medicine. The divine had to subscribe to a creed, his historical and philosophical knowledge of which must be tested. The lawyer had to administer the laws of the country according to the fixed principles and form of those laws, and his qualifying knowledge of such must be ascertained. The physician or surgeon had to deal with disease in all its forms, and none could be successful unless he had acquired an intimate knowledge of the anatomy and functions of the body and all its parts, as also of the experience of the past and the various methods used in combating disease. They had not to provide what the public wanted in the same sense as a picture painter or dealer, or as an architect, in designing a house or other building, had to meet the individual wants and desires of a client. They went to men of the professions he had named for what they were certified to possess and to be able to do, and not to dictate to them in what manner they were to be spiritually consoled, or to have the law administered or modified in the settlement of their affairs, or to have their physical troubles alleviated, so that in each case their own wishes might be met. The public dealt with architects on a totally different footing.

While it was true that a client might go to one architect rather than to another, because he was known or believed to be a better educated man in his work than others, yet, taken generally, the architect was but the interpreter of the public idea of art at any given time, and he had to provide what the public wanted and was prepared to pay for. No compulsory examination or diploma could alter this. The law could not, and would not, protect the public from bad art, because the public could and must at all times protect itself, and if it got bad art it got what it wanted, and the only thing it was able to appreciate. The one hope for art, and he spoke of art in its widest sense, was an educated public. When the public were able to distinguish good from bad, and when they came to look at art, not as a question of mere ornament and as a thing apart from structural and functional truth, then the bad architect would naturally disappear, and no artificial aid would perpetuate his kind or find work for him. While little had been heard lately of converting the architect into a certified professional man, their friend, the registered plumber, was still well to the front, and he was now asking the Legislature to pass a Registration Bill as a means of protecting the public health against the ravages of the incompetent man. How the passing of such an Act could do this he could not comprehend. If the Legislature could insure plumbers good prices for their work, there might be something in it. That registration would show that a man was competent, and be a guarantee to the public that good work would be done, was a fallacy. Nothing could make a good plumber or any other tradesman but employment on good work and under a competent foreman and master, and receiving proper payment for his work. Stuffing a lad's head with a lot of data about his work would no more make a good plumber than attending a class on navigation would qualify one to take a ship to sea. So far from the public requiring to be protected against the inferior plumber, it was the respectable plumber who required to be protected against the public. The keen and excessive competition which was stimulated by the demand for cheap work, the pitting of men of substance, experience, and character against men who had not these qualifications, was the real cause of bad work, and until that state of things was altered the registered plumber would only intensify the present unsatisfactory state of things. This claim to protect the public health was rather an arrogant one. The plumber was only a link in the chain, and if registration was necessary for him, it was equally so for other tradesmen. The mason and the Irish labourer who laid the drains were in every respect as important as the plumber, as far as health was concerned. The State could not protect the public from the incompetent tradesman unless it controlled both parties to the contract—that was to say, the work and the price to be paid for it. To attempt to do this would, of course, be an absurdity. He had looked over the Plumbers' Registration Bill, and all he could see in it was an arrangement for the appointment of secretaries, treasurers, and auditors, and the collection of fees, but nothing whatever that would add to the protection of the public and insure a higher standard of work, and for this very good reason, which knocked the bottom out of the whole thing, that no provision could be made for insuring payment for good work. But the State could do and was doing much that was already bearing good fruit in improving everything that concerned public health, and structures of all kinds, and by the appointment of public health officers, the passing of Public Health and Police Acts, and by the powers conferred on health officers, burgh engineers, and sanitary inspectors. The enforcement by law of these Acts alike against the public, the plumber, and the architect was the true and only way of bringing about a better state of things. While he was entirely opposed to all artificial distinction or hall-marking of a man because he had undergone an examination on subjects which were admittedly not those that tested the real qualifications that fitted a man for his calling, he was all in favour of education. Give every young man a fair opportunity of equipping himself for his life's work, then let him swim or sink on his own merits or want of them. The young man who had good stuff in him would educate himself up to the standard of his time, because he knew that to do so was the only passport to success. But they must provide the means of his doing this, and, as far as art work was concerned, that was





the reason for establishing their Applied Art School. That evening terminated his occupancy of that chair, and, in saying good-bye to them, he had to introduce to them his successor, Mr. R. J. Ross. Mr. Ross had long been a loyal and active member of that Association, and was well known, not only to all of them, but to a very wide circle outside. His magnum opus, which he prepared in conjunction with Mr. M'Gibbon, another valued friend and member of that Association, would long remain a monument of industry and research. It was now having, and would continue to have, an important influence on Scottish architecture.

At the close a hearty vote of thanks was accorded to Dr. Rowand Anderson.

#### ST. MARK'S SCHOOLS, FARNBOROUGH, HANTS.

**T**HE foundation-stone of these schools was laid on Wednesday by the Duchess of Connaught. The school will accommodate 250 children, and the architects are Messrs. Charles Smith and Son, of Reading.

#### THE PLUMBERS' REGISTRATION BILL.

**T**HE Standing Committee on Trade resumed consideration, on Thursday in last week, of the Plumbers' Registration Bill, Mr. John Ellis presiding. The object of the Bill is to afford additional safeguards to public health by enabling persons employing plumbers to select, when they desire to do so, persons who have given evidence of their qualification for plumbers' work. On clause 11, providing for the removal of names from the register and the restoration thereof, Mr. T. W. Russell proposed a series of drafting amendments, with the object of putting the clause into proper shape without at all changing its meaning. Mr. Whittaker contended that the sections of the Dentists Act mentioned in the clause should be printed in the schedule of the Bill. A country plumber should not be called upon to refer to other Acts of Parliament. There was a precedent for this kind of legislation. Every working plumber should understand what this Bill really proposed, especially when they were running the risk of being branded as unfit to carry on their trade. The Local Government Board, who had declined to take any responsibility in the matter, were doing their best to knock a miserable Bill into shape. Mr. Samuel also thought the sections of the Dentists Act

should be printed in the schedule of the Bill. Mr. Broadhurst said the speeches of the hon. member for the Spen Valley (Mr. Whittaker) were not dictated in the interests of the Bill. The clause they were discussing was not of the least importance to the plumber. The object of the Bill was to secure that a man who professed to be a plumber should be a genuine plumber by trade, having served his time to the business, and passed a proper examination. It was to prevent builders, bricklayers, and all sorts of handy men from working as plumbers. No more important object affecting the health, welfare, and security of the country could possibly be conceived. Mr. Holburn pointed out that the clause did not in any way deal with the competency of the workmen. Mr. T. W. Russell said there was nothing in the section affecting the qualification of plumbers. It only provided machinery for striking names off the register, and machinery for restoring them to the register. The proposal of the hon. member was that the sections of the Dentists Act referred to in the clause should be printed as a schedule to the Bill. He put it to the Committee whether they would be able to pass any legislation at all if every Act which was mentioned in a Bill had to be printed in the schedule. The amendments were agreed to, and the clause as amended was added to the Bill.

The Committee resumed consideration of the amendments on Friday. On the clause dealing with a qualifying examination for plumbers entitled to be registered through having been in business since 1892, Mr. Renshaw moved an amendment providing that such persons would be entitled to registration on payment of such fees as the general council of the district might fix. Mr. Russell refused to accept the amendment, saying that any batch who could pay the fees could then claim registration. The amendment was rejected by 17 to 8. An amendment was moved, declaring that throughout the measure, "master plumbers" meant those employers of plumbers who have *bonâ fide* practised at the craft, or who have been registered by the Worshipful Company of Plumbers prior to the passing of this Act. "Operative plumbers" meant those who have *bonâ fide* practised at the craft, or are practising, or who have been registered by the Worshipful Company of Plumbers prior to the passing of this Act. The Government accepted the amendment, and the clause was passed as amended. Liverpool was made the centre for the district council for West Lancashire, Cheshire, and North Wales; Manchester for Manchester and district; Leeds

for Leeds and district; and Birmingham for Warwickshire, Staffordshire, Shropshire, and Worcestershire. The Bill was then ordered to be reported to the House.

#### EUROPEAN ENAMELS.

**A**N exhibition of European enamels, from the earliest date to the end of the 17th century, is on view at the Burlington Fine Art Club, Savile-row. The preface to the well-prepared catalogue defines an enamel as "a metal object more or less coated with a deposit of glass applied at its melting temperature." Any other substance so coated is not an enamel in the strict sense. The case of Mediæval enamels is of the greatest interest. We may mention a 13th-century gilt-metal cover of breviary, set with jewels, with enamelled centre plaque (*champlevé*), adorned with a figure of St. Andrew, lent by the Earl of Crawford and Balcarres; a flabellum of the same date—a cross within a circle with some beautiful pierced work and scrolls; the centre of cross has a boss of crystal; the arms have enamelled plaques. Several very unique covers of missals are shown, the covers being Limoges plaques of *champlevé*, and dated 13th century. The examples of Limoges chasses are of particularly fine quality, with enamels of great brilliancy. One has a Christ in Majesty on the sloping cover, and arcades on sides with Apostles, the Crucifixion being in the centre. In Case III. we notice specimens of ciboria and covers, some of *champlevé* enamel on copper gilt, and of the 13th century; a pyx, Italian 14th century of hexagonal form, covered with figures of saints in enamels; heads of croziers, shrines; a fine Limoges chasse, 20in. long, 18in. high, and 9in. wide, of *champlevé* enamel, 13th century, with trefoiled arcades on the sides filled with the Twelve Apostles in two tiers; and a fine 16th-century crucifix, Italian, with crystals in the limbs. Another (62) is Late 14th-century Italian, with quatrefoil medallions at the ends of limbs. The painted Limoges enamels over the mantel-piece and in Case IV. are of particular beauty; and several medallions, plateaus, and a handsome triptych (*grisaille*, by Pape) and caskets deserve attention. We cannot describe all the cases and objects. These very choice objects have been lent by the Queen and several noblemen and gentlemen. The painted enamels occupy the largest place in this collection. The incrustated jewels have much beauty and interest, and a few specimens of *basse-taille* (where the enamel is in



low relief, the modelling being visible through the glass coating) deserve attention. A few admirable specimens of tapestry contemporary with the period of the painted enamels are hung on the walls of this interesting and instructive exhibition, which every lover of art should see.

#### THE AUCTIONEERS' INSTITUTE.

THE annual meeting of the members of the Auctioneers' Institute of the United Kingdom was held in the lecture-hall of the Institute, Chancery-lane, W.C., on Friday, Mr. James Frederick Field, the president, in the chair. The council stated in their report that 97 new members had been elected during the year. The income amounted to £1,608 4s. 7d., and the expenditure to £1,330 9s. 10d., leaving a cash balance to be carried forward to the next year of £277 14s. 9d. The president, in moving the adoption of the report, congratulated the members on the continued progress and success of the institution. The great expansion of the business of the institute and the costs incurred in the action taken by the council for the protection of the institute had caused the expenditure for the year to be heavier than usual. The examinations were now being earnestly taken up by students. Efforts had been made during the year to remedy the present unsatisfactory method adopted by the Inland Revenue authorities of receiving estimates of value for probate and estate duty purposes from persons not competent to value. It was the opinion of the council that a considerable loss of duty was sustained in connection with this matter, and they hoped that a change would be brought about at no distant date. Mr. James Green seconded the motion, which was adopted. The retiring members of the council were re-elected, and other routine business having been transacted, Mr. Frank Everill, past-president, invested the president with a president's badge and chain of office subscribed for by members of the institute throughout the kingdom, and to be worn by each successive president during his term of office.

The 11th annual dinner of the members of the institute was held at the Hotel Cecil on the same evening. The president occupied the chair. Sir W. T. Marriott, in proposing the toast of the evening, "The Auctioneers' Institute of the United Kingdom," congratulated the institute upon the standing which it had attained. The president, in response, said that during his period of office an effort had been made to obtain a charter of incorporation, and although personally he was not satisfied that the achievement of that object would be a wise step for the institute, it was hoped that such a charter would soon be granted. The remaining toasts were "Kindred Institutions," proposed by Mr. H. C. Richards, M.P., and acknowledged by Mr. C. Oakley and Sir A. W. Blomfield, on behalf of the Surveyors' Institution and the Royal Institute of British Architects, "The Corporations of the Cities of London and Oxford," proposed by Mr. F. Everitt, and acknowledged by Mr. Alderman S. Green, the Mayor of Oxford, and Mr. Ex-Sheriff Cooper; and "The Visitors," proposed by Mr. Douglas Young, and responded to by Sir W. W. Karslake, Mr. E. J. Castle, and Mr. Lewis Coward.

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—XVII.

CONTINUING our study of columns or pillars, Fig. 76 illustrates a light open column which supported the principals of the Miscellaneous Industries courts in the last Paris Exhibition; it was composed essentially of two lattice standards, united by means of angles to two web plates A A. The lattice bracing *a* is riveted to gusset plates, which are riveted both to the vertical angles and to the transverse angle-stiffeners *b*, and also to each other at the centre; the base is formed of four gusset brackets, B, formed of plate and angle. The type is one which is light, but very rigid.

To illustrate in how simple a fashion a pier or column of cylindrical section can be built, Fig. 77 shows the elements of the construction of the piers for the main span of the Salads Bridge, near Santa Cruz. The upper portion of the piers is 6ft. 6in. diameter, and the lower 8ft. 6in., the rings being 4ft., and 3ft. 4in. deep respectively, and the plates ranging from  $\frac{3}{4}$ in. to  $\frac{1}{2}$ in. in thickness. The cylinders are filled with concrete—A shows one of the upper rings, and B the com-

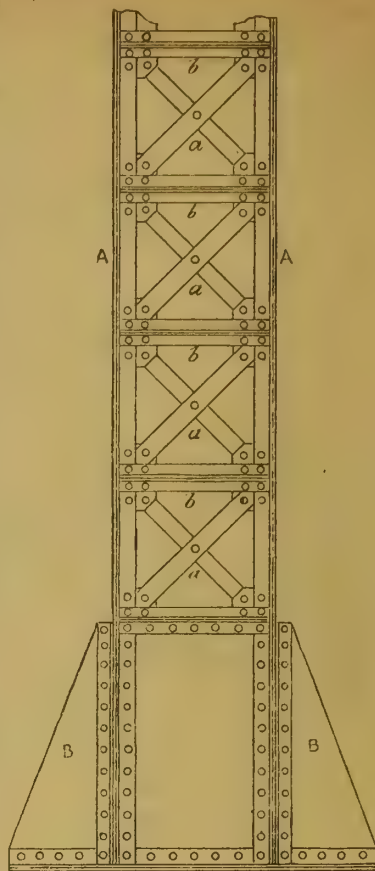


FIG. 76.

mencement of the lower ones. Tees, *a*, and flat bars, *b*, cover and unite the joints; the vertical joints are made by internal tees, *c*, and external bars. The setting-out of the flanges of the tees, and of one-half of the width of the bars is done by the angle-iron smith in the bridge builders' yard, and when the setting out is but moderate in amount, as in Fig. 77, it can be readily accomplished by making the tees or flats red-hot, and setting them in detail over the edge of a block or by a special rig-up of rollers. The tapering

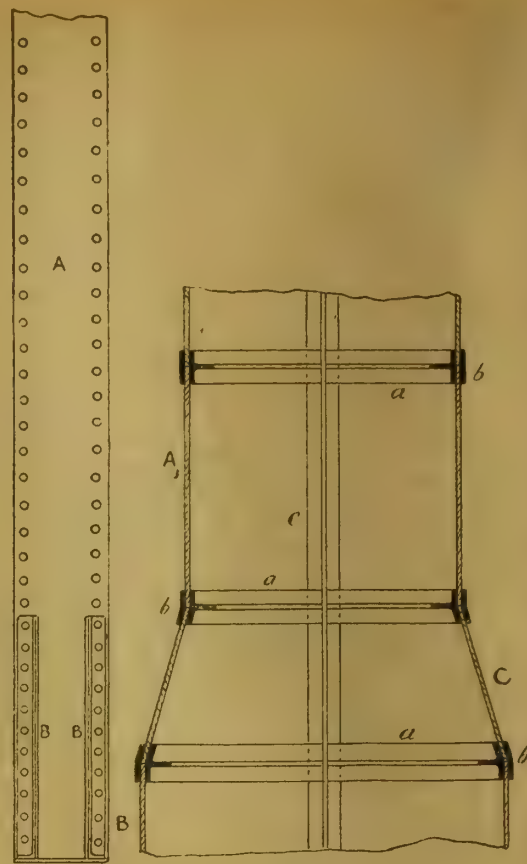


FIG. 77.

them are but  $\frac{1}{2}$ in. thick, but they are stiffened with internal tees, as shown, and filled with concrete to a certain height. The outer tee, *b*, affords an attachment for the bracing, by which pairs of adjacent piers are connected together.

In the building-up of large cylinders which have to serve as columns or as piers, the advantages which steel affords over iron are apparent in the diminution of joints required. Cylinders of 6ft. and 7ft. diameter, like those illustrated, can be made in rings of 4ft. and 4ft. 6in. wide, in

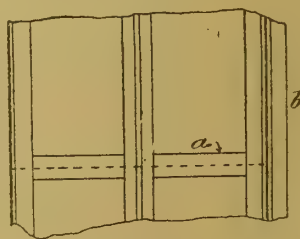


FIG. 78.

plate C is struck out as a frustum of a cone by the usual graphical method.

Fig. 78 is another illustration of a very light cylindrical pillar; it is the type which was used for the piers of a remarkably light arched bridge recently built—the Snodland bridge over the Medway, in which the arches also were formed of steel tubes instead of ordinary girder section. The weight of the bridge is but 12.21 cwt. per foot run. The largest piers, Fig. 78, are 6ft. 6in. diameter, jointed together in rings of 4ft. in length, with cover-strips *a*; the plates comprising

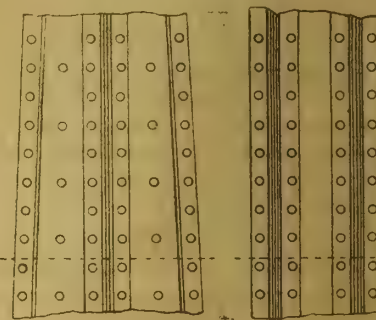


FIG. 79.

thicknesses of  $\frac{3}{4}$ in. or  $\frac{1}{2}$ in. in a single sheet in steel, and with two rows of rivets only; these rings, made in iron, would require three or four sheets, and a corresponding increase in the number of covering strips and of rivets, besides the added weight. Rigidity can be obtained also much better by the insertion of tees set vertically, or as rings, or in combination, with or without the aid of web-plates, than by increasing plate thickness. Such cylinders are often filled with concrete, the latter then becoming the principal element in the strength of the column or pier.



Columns may evidently be classed under two types—the light and the heavy. The first are used when it is necessary to limit the load on foundations, the second when load is of little importance. The first cost more per ton because the distribution of the material and the multiplication of elements and of fastenings increase the cost of labour; the second involve less labour, and therefore a lower cost per ton.

Fig. 79 illustrates a method of construction of

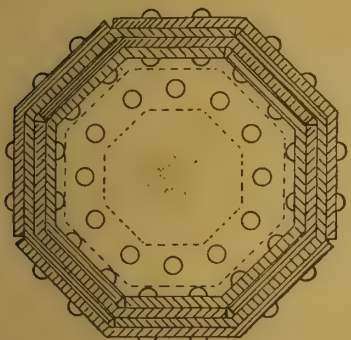
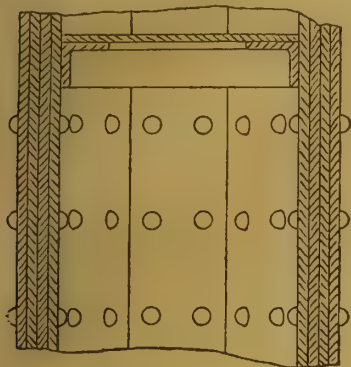


Fig. 80.

one of the main pillars of a Brazilian cantilever bridge. These pillars are 31ft. 7in. long, and have each to bear a strain of over 400 tons, yet the plates in the pillars are only  $\frac{3}{4}$ in. thick, and afford a good illustration of economical distribution of metal. The angles afford rigidity, as well as means of attachment for the thin plates.

Fig. 80 shows, by way of contrast, a very massive design of column used at the central low-level station of the Glasgow Central Railway, which runs underneath the very busy thoroughfare Argyle-street. These columns have to sustain heavy traffic and incessant vibration, and would be, as a rule, made in cast-iron; a feeling of dis-

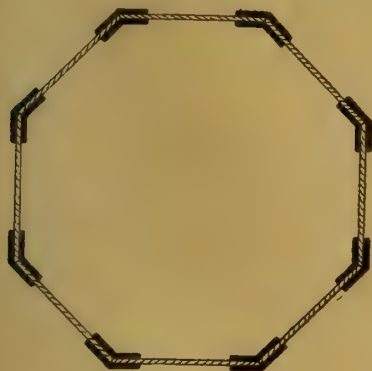


Fig. 81.

trust of the latter, where heavy alternating stresses are imposed, led to the design shown. These columns, though but 14ft. high and 1ft. 8in. across flats, weigh 14 tons each; they are built of plates  $\frac{3}{4}$ in. thick, each bent to form two and three sides of the hexagon, the joints overlapping and rivets passing through the whole series of four plates. The combined thickness is thus equal to that of a cast iron column with  $2\frac{1}{2}$ in. metal. The unpleasant hexagonal form is concealed above the station platform by a covering of cast iron with an

ornamental capital; beneath the station platform a broad hexagonal base, 4ft. 9in. across the flat, is riveted to the columns, and stiffened with eight gusset brackets. The base rests upon a granite block, which in turn is supported by a concrete foundation; the girders which carry the traffic overhead rest upon broad plates on top of the columns, supported with angle knees. On the whole, it would not be easy to devise a better type of column suited for exceptionally heavy traffic.

Fig. 81, though of the same section, is an example of a light pillar; it is an elementary section of the columns which are used on the Tower Bridge. The leading feature of this bridge, regarded from the architectural standpoint, is the disguising of a steel structure, with masonry of an architectural character. Probably many non-professional visitors imagine the piers are built, as they appear to be, wholly of masonry; but the latter is merely an addition, the whole of the actual stress and work being borne by the steel pillars underneath. The piers of the bridge are of exceptionally large area, because they rest upon the London clay, and the load was limited to four tons per square foot; each pier carries four octagonal columns like Fig. 81, about 120ft. high and 5ft. 9in. across—girders and diagonal bracing connect these columns. Four smaller octagonal columns, 4ft. 6in. diameter, rest upon each of the abutments, and are similarly connected and braced; about five miles of steel plates were used in building these columns.

It is believed that there is but one other bridge in the world which has such large foundations in proportion to its weight as the Tower Bridge,

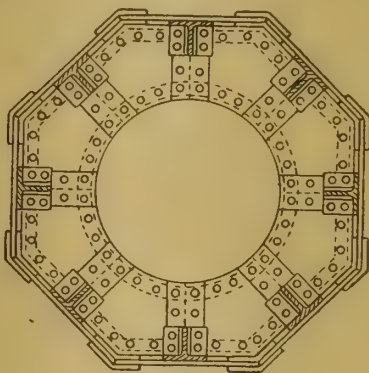


Fig. 82.

that one is the Brooklyn Bridge in the United States. The reason why so little pressure as four tons per square foot was allowed, is, that it was absolutely necessary that the foundations should not settle subsequently to the completion of the superstructure. Any subsidence then would interfere with the working of the hydraulic machinery and the good fitting of the bascules; by means of a trial cylinder it was found that a permanent settlement occurred at four tons per square foot, but at  $6\frac{1}{2}$  tons the settlement went on increasing, hence the permanent load permissible was fixed at the lower limit. The castellated structure was intended to be in harmony with the Tower of London adjacent, but the concealment of the steel which lies next the inclosing masonry, which renders examination and painting there impossible, is undesirable; the best that could be done under the circumstances has been done. All parts of the columns which are inaccessible have been coated with Portland cement, and access to the interior of the columns is provided for through manholes. To provide against possible damage to the masonry in consequence of expansion and contraction of the steelwork or changes due to stress, canvas was wrapped round the steelwork while the masonry was built round, and spaces were thus left where it seemed desirable or necessary to leave them.

It is not easy to illustrate the construction of these columns in full detail without making use of a large number of drawings. They afford an excellent example of the distribution of the minimum of material to afford the greatest strength; they are of octagonal section, similar to those used on the Glasgow railway, illustrated in Fig. 80; but there the similarity ends. The latter are short and stiff, affording great solidity to withstand the vibrations of heavy rolling loads—

the former are high and light. The main towers measure 5ft. 9in. across flats (outside measurement), and are built of plate from  $\frac{3}{4}$ in. to  $\frac{1}{2}$ in. thick, varying from three thicknesses below to one above; the sides are stiffened by T-sections running vertically, and by various diaphragms at intervals of about 3ft. The union of plates by means of splayed angles, Fig. 81, makes a light, moderately strong structure of large cross section;

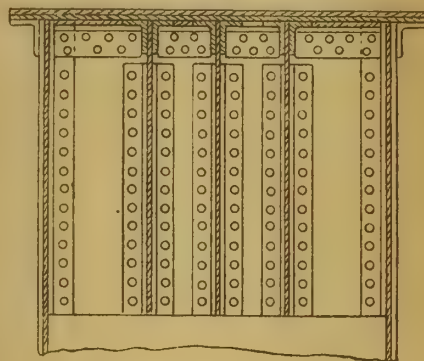


Fig. 83.

but the risk of collapse, due to the stresses transmitted through the girders, has to be guarded against by the insertion of stiff diaphragms, and each single plate is stiffened by the riveting on of a tee bar. The jointing of the various lengths is effected through the medium of numerous cover-plates; some of these details are shown in Figs. 82, 83. Fig. 81 shows the general design on which the skins of the column are built up, the view being through a section near the top where one-plate thickness only occurs, united by inside

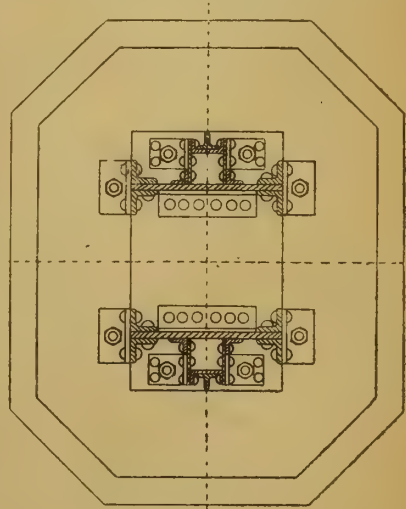


Fig. 84.

and outside splayed angles. Fig. 82 shows a section above an ordinary diaphragm, these occurring at intervals of about 3ft., though but  $\frac{1}{4}$ in. in thickness, impart great solidity to the columns. A hole 3ft. diameter, where metal would be wasted, permits of free access through manholes to the whole of the interior, from top to bottom, for examination and painting; the edges of the hole are stiffened with



an angle ring of a 4in. by 3in. by  $\frac{1}{2}$ in. section. A specially rigid form of diaphragm is built into the top of the column, it is shown in Fig. 83. Extending 6ft. down from the top a system of plates and angles affords the utmost rigidity against crushing and tensional strains due to the combined stresses of the high-level footway and the massive segment chains; the plates composing this are  $\frac{1}{2}$ in. thick and the angles 4in. by 4in. by  $\frac{1}{2}$ in. The bases of the columns are of octagonal form, comprising a large extension of the same shape as the columns, extending to 14ft. across the flats and stiffened with a network of vertical gusset-plates and angles.

Figs. 84 and 85 show sections through one of the steel towers which carry a suspension bridge in Philadelphia. Plates *aa*, Fig. 85, and angles *bb*, *bb*, are connected with bracing *cc* of angle section; in order to afford increased stiffness longitudinally or in the direction of the links, structures of plates, angles, and channels, *dd*, are riveted to the plates *aa* at the centre. In Fig. 84 the attachment of the tower to the masonry foundation is shown; a broad plate and various angles connect the tower to the foundation, and eight bolts pass down through the angles and the stone.

As regards the æsthetic aspect of all these unsightly steel pillars, the circular excepted, which are built solely from the point of view of the combination of the minimum of material with the maximum of strength, perhaps the less apology made the better. The most enthusiastic

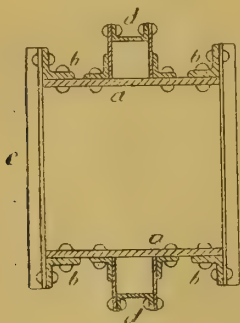


Fig. 85.

engineer can hardly feel more than a subdued kind of satisfaction in contemplating the steely vertebrae and ribs, the fleshless skeletons of steel which stand out in their gaunt anatomy; custom familiarises one with distasteful objects and utilitarianism is the hall-mark of the engineer. It is not surprising, therefore, that attempts are frequently made to conceal, or disguise, or modify unpleasant designs by pseudo-architectural excrescences, and by coverings of masonry and of cast iron; the effect is seldom entirely pleasing and satisfactory either to the architect or to the non-professional cultured eye, but it is often much better than no covering at all. J. H.

#### STABLE CONSTRUCTION AND SANITATION.—XV.\*

FOR general purposes the manger fittings should be placed from 3ft. 3in. to 3ft. 7in. above the floor level, according to the size of the animal, and in fixing them it is necessary that they should be so arranged as to prevent the horses striking themselves on the underside of the manger when rising suddenly from the floor. This may be effected by forming a slope or ramp to the lower portion of the wall at the head of each stall, as shown in Fig. 142. The underside of the manger may also be boarded-in if preferred, or inclosed with a wrought-iron guard grating, as in Fig. 157. Specially constructed safety manger fittings for stalls and loose-boxes may also be obtained, in which the whole of the bottom and front of the manger is smoothly and gradually rounded off in an easy curve, as shown in Fig. 156. When dealing with horses which are confirmed "crib-biters," other descriptions of fittings may be obtained which have been purposely designed for their use. In this connection the arrangement devised and patented by Professor Varnel for the prevention of crib-biting may be briefly mentioned. These fittings, instead of being permanently fixed as in the ordinary method

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of construction, are pivoted at the lower edge, so that when not in use they are entirely hidden from view by being drawn back into an opening or recess provided in the wall. When they are secured in this position the stable wall then presents nothing but a vertical and even surface, leaving no projections which could be grasped by

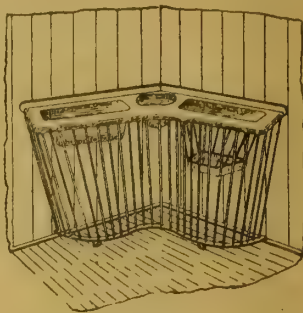


Fig. 157.

the animal's teeth. Fittings of this description are arranged for use either in stalls or loose-boxes.

Whilst measures must be taken to properly secure and confine each horse to its own stall, every facility should be given them to feed freely and to lie down comfortably at any time. The tying apparatus as generally used consists essentially of a light chain or leather strap attached to a weight, and sliding freely through a ring in the manger. Fig. 158 shows the general arrangement. For safety, the rising and falling weight is usually inclosed in a cylinder or sheath, as indicated by the dotted lines in the sketch.

For loose-boxes a horizontal tying-bar, having a sliding traveller of iron or brass, is used. The sketch of one is shown at A, Fig. 141.

Amongst other minor stable fittings that are required for the complete furnishing of a stable may be noticed the following—viz:—

The "head stall fastening." This consists of a drop ring (as at E, Fig. 141), to which the horse is secured by means of a "rack chain." Fig. 159 shows a rack chain arranged with a swivel and two rings, together with a spring hook at each end.

Every heel-post should also be provided with a drop-ring placed in front of the pillar (as at C, Fig. 141), from which a pair of heel or pillar-chains may be suspended. Fig. 160 shows a 3ft. 6in. pillar-chain fitted with a swivel and two spring-hooks, and hanging from the drop-ring

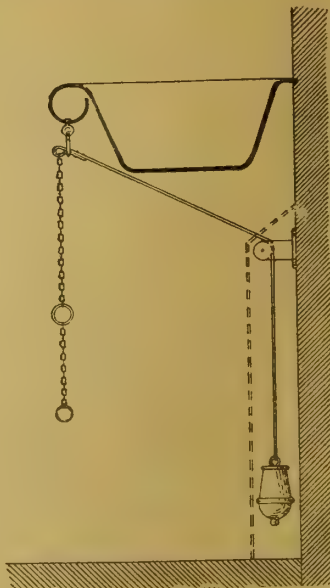


Fig. 158.

fixed near the top of the heel-post. Two pillar-chains are required for each stall, so that after the horse is completely harnessed it may be secured in a position convenient for leaving the stable when required.

At the head of each stall and loose-box a name or number plate is generally fixed as shown at D in Fig. 141. The frame of the name-plate is

firmly attached to the wall, whilst the panel on which the name appears is arranged in the form of a movable plate which can be taken out at any time, so that any other name or number may be inserted. The plates and frames are made in numerous ornamental designs.

#### HARNESS-ROOM AND FITTINGS.

The harness-room should be placed as near as possible to the stalls and loose-boxes, in order that it may be conveniently reached when the various articles of harness are required; the interior should be well-lighted, dry, and properly ventilated; the floor is usually formed with  $1\frac{1}{2}$ in.



Fig. 159.



Fig. 160.

deal wrought, ploughed, and tongued battens on fir joists. Portland cement concrete, 6in. thick, and resting on a 4in. bed of hard, dry, broken, brick rubbish is previously laid over the whole area under the wooden floor so as to prevent any rising of ground moisture from below.

The walls, instead of being plastered, should be lined with  $\frac{1}{2}$ in. deal wrought, grooved, tongued and beaded or V-jointed boarding, in batten widths, secured to 2in. by  $\frac{1}{2}$ in. deal grounds plugged to the walls, and finished with 7in. by 1in. deal moulded skirting scribed to the floor. The whole of the woodwork is afterwards painted,



Fig. 161.



Fig. 162.

or sized, stained, and varnished with two coats of best copal varnish.

The general scheme to be adopted in furnishing the harness-room will, of course, depend in a great measure on the character of the stable buildings; to suit these varying conditions a very large variety of brackets and other fittings are now made by the different manufacturers of these articles.

Figs. 161 and 162 are typical illustrations of



brackets suitable for supporting a lady's and gentleman's saddle respectively, whilst Fig. 163 is the sketch of an ordinary bridle bracket. Fig. 164 shows a pad-bracket for single harness, together with a collar-bracket at Fig. 165; a small and useful harness hook is also shown at



Fig. 163.

Fig. 166. These fittings are made of wrought or malleable iron, and, by their shape, allow a free circulation of air throughout; they should be thoroughly well painted or japanned; but in some cases, where expense is not an important consideration, the ironwork is entirely covered with leather. Similar descriptions of harness-fittings may also be obtained, which are finished with



Fig. 164.

cappings of polished hard wood properly shaped to the required curve; any risk of damage to the harness from the rusting of the ironwork is prevented by this means. The brackets, &c., are fixed to the wall lining in convenient positions, and for stables of a high-class character they are also inclosed in wall-cases, having sliding or hanging doors filled in with glass.

A small case, lined with cloth and having a



Fig. 165.

glazed front, is fixed above the fireplace; it is fitted with hooks or small brackets to hold spurs, bits, and other polished metal harness fittings.

Fig. 167 shows a telescopic harness-cleaning hook arranged to hang from the ceiling; it is capable of being adjusted to any required height, and may be removed when not in use. The cleaning-hooks should be covered with leather to prevent injury to the harness.



Fig. 166.

The "saddle and harness-cleaning" horse, shown in Fig. 168, is a very useful and compact article of furniture; it is provided with drawers and cupboards for the reception of sponges, brushes, and other cleaning materials. The top is made in two leaves, and designed to turn down so as to form a table when not used for cleaning purposes.

Amongst other requisites that are usually provided may be mentioned a "saddle airer" and

"girth stretcher"; in general appearance the "saddle airer" resembles an easel or stand, on which the saddle is fixed when placed to dry in front of a fire or in the open air. The "girth



Fig. 167.

stretcher" consists of an iron or wooden frame on which the damp girths are stretched whilst drying.

#### COWHOUSE FITTINGS.

The sanitary objections to the use of wood for stabling fittings have already been mentioned, and they apply with equal or even greater force to

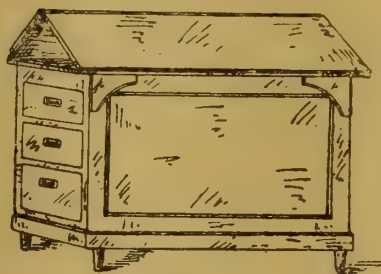


Fig. 168.

cowhouse fittings made of this material. Should milk become in any way contaminated by disease germs, it provides a most favourable medium for their multiplication and dissemination; considering that milk in some form or other constitutes a most important article of diet, it is essential that the fittings and everything connected with the cowhouse should be constructed of materials which are in themselves impermeable and easily cleaned, so that any risk of harbouring disease may be reduced to a minimum. Fittings, which are wholly, or in a great measure, composed of iron or glazed stoneware, may therefore be considered as offering the most satisfactory con-

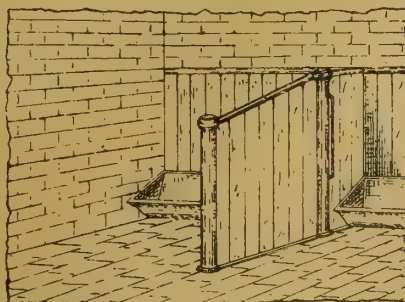


Fig. 169.

struction that has yet been introduced for this purpose.

For cowhouses of an ordinary class the stall divisions are built entirely of wood, in a manner similar to that already illustrated and described in Fig. 143; sometimes an iron sill, heel-post, shoulder-post, and top rail or ramp is provided, as shown in Fig. 169. An iron vertical tie-bar is attached to the shoulder-post, on which the binding

chain may slide up and down. A modification of the preceding type of stall division is shown in Fig. 170, having a heel- and shoulder-post provided with a vertical groove, in which the division boards are fitted; these boards may be removed at any time to allow of the building

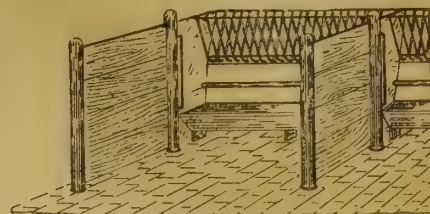


Fig. 170.

being thoroughly cleansed from end to end. Movable heel-posts (standing in iron ground-sockets) can also be obtained if desired.

Stall divisions, which are constructed entirely of iron (Fig. 171), provide the most sanitary form of this class of fitting. The illustration shows the usual wrought-iron tying bar at the head of the

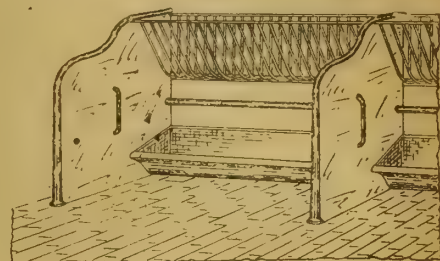


Fig. 171.

division, together with an enamelled cast-iron feeding-trough and hay-rack above.

Feeding-troughs of well-glazed stoneware are thoroughly impervious and readily cleaned, but the glazed surface is easily damaged by rough usage. Fig. 172 is a section through a feeding-trough formed with special-made manger blocks, and a sketch of the manger complete with moulded

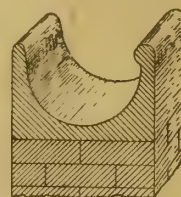


Fig. 172.

and stopped ends is shown in Fig. 173; the blocks are formed with a rolled edge on the inside to prevent the cattle throwing out and wasting the food. Manger blocks, having a roll on both the inside and outside edge, may also be obtained.

Cast-iron feeding-troughs are well adapted for heavy wear, and are extensively used; the best descriptions are porcelain enamelled on the



Fig. 173.

inside. An illustration of a cast-iron feeding-trough is shown in Fig. 171, but they are manufactured in a great variety of sizes and sections to suit different requirements.

#### LONDON COUNTY COUNCIL IMPROVEMENTS.

THROUGHOUT the past fortnight a select committee of the House of Commons has been considering the General Powers Bill pro-



moted by the London County Council. As we stated in our last issue, the committee rejected the scheme for the extension westwards of the Chelsea Embankment, but decided on Friday that the preamble of the Bill was proved so far as the proposed new 60ft. street from Great Prescott-street to the Tower-bridge is concerned, and that railways were not to be exempted from the betterment clause except so far as their running lines were concerned. During the present week the committee have been considering the section which proposes to widen the Strand by removing the island of houses lying between the churches of St. Mary-le-Strand and St. Clement Danes, and between the north side of Holywell-street and the south side of the Strand. Evidence in support of the scheme was given by Mr. C. J. Stewart, clerk to the County Council, and Mr. A. R. Binnie, the engineer to the Council, the latter giving his estimate of the cost as £23,000 for works, and £546,130 for acquiring property and compensation. Mr. Andrew Young, F.S.I., valuer to the London County Council, estimated the value of the land proposed to be taken for the improvement at £546,130. A clause was agreed upon between counsel for the County Council and the owners of the Opera Comique, requiring the Council to take the whole Opera Comique premises as well as the Strand entrance and subterranean cloak-room as proposed in the Bill. Evidence in support of the removal of the Holywell-street island was given by Mr. J. F. Field, surveyor, and others. On behalf of the Strand District Board of Works, Mr. A. Ventris, the surveyor of the Strand Board, was called, who said it would be absolutely necessary to widen Wych-street. It had been agreed formerly to widen the Strand to 80ft., which was its width elsewhere; and he saw no reason to extend that width to an extreme of 142ft. One fatal blot on the present scheme was that it did not deal with the narrow street between the Church of St. Mary-le-Strand and the north side of the Strand. The rateable value of the property proposed to be removed was £10,865; of the island of houses between Holywell and Wych Streets, £7,670; and of the remainder of the betterment area, £74,087. The area of the island between Holywell and Wych Streets was 37,740sq.ft., and of the property to be removed 32,560sq.ft. If the Strand were only widened to 80ft., which would be ample, instead of as proposed, 24,750sq.ft. of area, at present taken for thoroughfare, would be available to build upon. The clause is still under consideration.

#### DOMESTIC BOILER EXPLOSIONS.

**M**ESSRS. LANT AND COOPER, of Dunston-on-Tyne, some time since, according to the *Newcastle Daily Chronicle*, began a series of experiments which have resulted in a patent, the chief object of which is to remove the boiler altogether from the fire which heats it. Commonly the kitchen fire has behind it the boiler which supplies the household with hot water. If by frost the boiler be converted into a sealed box, the kitchen fire must be kept extinguished for so long as the frost lasts, or there is an imminent danger of an explosion. If the boiler be removed from all contact with any fire, a great point is gained. This Messrs. Lant and Cooper do; but they nevertheless heat their boiler from the kitchen fire by the ingenious method of placing it at the highest point in the house where the hot water is required, building it partly into the chimney stack, and leading up to it from the kitchen fire a special flue with an inlet in the brickwork at the bottom of the back of the fireplace, through which a current of superheated air and gas are drawn as through a furnace up to the boiler, which is cylindrical in shape, and may be made of any length that is required, and which is perforated along its whole length by three copper pipes of large diameter. These pipes are surrounded up to a certain height by the water in the boiler, which is fed from an adjacent tank so placed that the boiler is never full. The water is heated as quickly as by the ordinary method, and, through being built into the brickwork of the chimney-breast, retains its heat much longer. Pressure is done away with, the steam escaping freely through a pipe at the top of the boiler, along with the hot air from the flue, into the chimney flue. On the top and bottom of the boiler a casting is fitted, having a door through which the tubes passing through the boiler, as well as the flue, may be got at for purposes of cleaning if required, though it is claimed that this would very seldom be necessary, as the hot-air flue is placed near the bottom of the fire, so that it is below the level of the smoke, which ascends up the chimney, while there is complete combustion at the bottom of the hot-air flue owing to the fierce heat

caused by the powerful draught. A suitable damper is fitted at the lower end of the flue, so that, if needful, the hot-air supply can be altogether cut off from the boiler. The cold-water inlet to the boiler from the supply tank is at the bottom of the boiler, and the outlet pipe at the top, so that by feeding at the bottom, as hot water always rises, there is always a supply of warm water. Once hot, it is always hot. The system is automatic, and requires no attention, working by gravity, for the hot air ascends without any artificial inducements, and the water runs to its level. Less piping is required all over the house, and by the new disposition of the pipes it is made impossible for them to freeze. But the great thing about it is that it is safe. It renders frozen pipes and domestic boiler explosions an anachronism.

#### CHIPS.

After a protracted illness, Mr. Henry Jenkinson, of Halifax, died on Friday morning in his 64th year. He was a builder and contractor, and during his career entered into some extensive undertakings. He leaves two sons and two daughters.

The past week at the Auction Mart will rank among the best of recent years, the aggregate showing the important sum of £245,576. A sale of gas shares, and an important Scotch estate made up a considerable portion of the total; but, in addition, the all-round business was of a most satisfactory character, the properties disposed of being of a varied description, and the demand throughout brisk for all the safer investments.

The first turf was formally cut on Friday on the site of the hospital for infectious diseases to be erected at Colinton Mains for the corporation of Edinburgh. The hospital will contain 600 beds for patients, and is to be built from plans by Mr. Morham, city architect, at an estimated cost of £400 per bed.

At the last meeting of the Ipswich Town Council a letter was read from Mr. John Dupuis Cobbold, of Holy Wells, offering as a free gift 11½ acres of land on the old racecourse as a playground for the east end of the borough. The land is to be appropriated for football in the winter, and for cricket during the summer months. The gift, which represents a monetary value of from £3,600 to £4,000, was accepted with thanks.

The application of Falmouth Town Council for sanction to borrow £3,000 for the purchase and improvements of the markets formed the subject of an inquiry held in the town-hall on Thursday in last week by Mr. E. P. Burd, an inspector of the Local Government Board.

The tomb of the late M. de Falbe, near Luton, has now been completed by Mr. W. D. Chalkley, of 18, London-road, St. Alban's. It is of white Sicilian marble, with a recumbent cross (solid), resting on a solid polished red granite base. The stone plinth is from Messrs. Fisher Bros.' quarries of red Mansfield stone, Notts. The railings were executed by Mr. S. B. Joslin, of the Bishopgate Foundry and Art Metal Works, London, from full-size designs by the architect, Mr. F. Trevor Davys.

The fifth annual meeting of the Bury Building Trades' Federation was held at the Stanley Arms Hotel on Wednesday week. The president (Mr. J. E. Crossley) occupied the chair. The report submitted by the secretary (Mr. S. Hall) stated that during the past year the Joiner's Society has gained an advance in wages of ½d. per hour in addition to a reduction of working hours. This the council advised all the societies in the federation to try to obtain, so as to insure a greater regularity of work, and possibly absorb a few of the unemployed by so doing. The report having been adopted, officers for the ensuing year were elected as follows:—President, Mr. R. Wild; vice-president, Mr. D. Riley; secretary, Mr. W. Harper; treasurer, Mr. T. Tomlinson; auditors, Messrs. E. Marsden and J. Lacklison.

Plans have just been sanctioned for the erection of additions to the Episcopal Schools, Stonehaven, N.B. These comprise large classrooms, teachers' retiring-rooms, cloakroom, and lavatories; also new staircase. The elevation to High-street is of Gothic design, and the front dressings will be of Brechin stone. All the inside finishings are to be of pitch-pine. The architect is Mr. J. Augustus Souttar, Aberdeen.

Mr. Keith D. Young, F.R.I.B.A., has prepared plans for the replacing of the present Royal Portsmouth, Portsea, and Gosport Hospital by a more modern institution. The outpatients' department and the administrative block face the street, the latter connected with a ward of ten separate bedrooms. At the rear, and connected with each other, are four parallel wards of twenty beds each. The laundry is practically a block to itself. Two of the last-mentioned wards are first to be built on vacant sites, the remainder of the land being gradually cleared, and the present buildings replaced.

#### OBITUARY.

Mr. W. S. FRASER, an architect practising at Pittsburgh, Penn., born in Ohio, July 19, 1852, died at Pittsburgh, April 27, after an active career of 18 years in that city. The son of a contractor, he at the age of 17 began his professional training in the office of a New York architect, pursuing courses of study at the Cooper Institute during the same time. After five years spent in this way, he came to England and became a pupil of the late William Burges, A.R.A., of John-street, Adelphi, studying likewise at the Royal Academy Architectural School, and spending the vacation time on the Continent, sketching and measuring. Mr. Fraser's design for the Carnegie Library at Allegheny and that for the Cathedral of St. John the Divine in New York show how thoroughly he was imbued with Burges's love for 13th-century Gothic, and how skilfully he modified it to meet modern and Transatlantic conditions.

Mr. JOHN BALLANTYNE, R.S.A., died last week, after a short illness, at Seend, Melksham, Wilts, at the age of 82. He was a member of the family of Edinburgh printers the partnership of Sir Walter Scott with whom had such disastrous results for the novelist—his father being Mr. Alexander Ballantyne. At an early age he exhibited his first picture at the Royal Academy's Exhibition at Somerset House. Thenceforward, until within the last few years, he was a frequent exhibitor of *genre* works on the walls of the Academy, making many copies of the masterpieces of deceased masters from the picture galleries of the Continent, and executing a series of "Portraits of Celebrated Painters in their Studios," which attracted considerable attention, and one of which, that of Sir Edwin Landseer, was a few years since presented by Sir William Agnew to the National Gallery, Trafalgar-square. He is represented in the Scottish National Portrait Gallery by a portrait of Sir William Hamilton. In 1841 he was elected an associate of the Royal Scottish Academy, becoming a full member in 1860. Mr. Ballantyne in his younger days was an enthusiastic Volunteer, and had held a commission in the Artists' Company, and that of commandant of the Edinburgh Artillery Regiment.

Artisans' dwellings are being erected at Donnybrook, Co. Dublin, for the Pembroke Township Commissioners. The contractor is Mr. Samuel Worthington, of Dublin.

Mr. A. H. Claypole, of Manchester, has been elected as surveyor's assistant under the Bristol city council from among a large number of candidates.

The Slade Professor of Fine Art at Oxford University, H. E. Wooldridge, M.A., will give his first three lectures upon the "Sphere of Paduan Influence" on Monday, Tuesday, and Wednesday, May 24, 25, and 26, at the University Galleries in that city, at 4 p.m.

The annual general meeting of the Surveyors' Institution, to receive the report of the council, and the announcement of the result of the election of officers for the ensuing year, will be held on Monday week, May 31, at 3 o'clock. The prizes awarded to successful candidates in connection with the recent preliminary and professional examinations and junior meetings will be presented by the president at the annual general meeting.

Mr. Gladstone will open in June the new swing bridge which has been erected over the Dee at Queensferry, Hawarden, at a cost of £13,000, contributed by the Flintshire and Cheshire County Councils and the adjacent landowners (including the trustees of the Hawarden estate). The bridge is still in the hands of the contractors.

The North British Arbroath and Montrose Railway, forming a section of the North British Railway's through route from the south to Aberdeen, while constructed and hitherto worked as a single line, was from the first intended to be doubled, and three years ago the Company obtained powers from Parliament to double the line. It was resolved to proceed in the first place with the doubling of the section between Arbroath and Inverkeilor, which is about six miles long, and half of the whole distance to Montrose. The works were begun about this time last year, and have just been completed.

Major Tulloch, the well-known Local Government Board inspector, held an inquiry at the Guildhall, Canterbury, on Tuesday to investigate the application of the town council for permission to raise a loan of £23,000 for the purposes of a municipal electric-light installation in the city. Considerable opposition was raised to the proposal.



## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—On Saturday the annual meeting of the above society was held by permission of the Mayor in the Guildhall council chamber, Devonport. The members present were Mr. Arnold Thorne, president (Barnstaple), Messrs. Charles Cole and O. Ralling (Exeter), J. Hine, C. King, M. A. Bazeley, J. H. Dwelley, R. Mill, C. P. Shires, A. S. Parker, and W. J. Carder (Plymouth), H. G. Luff, W. N. Richards, E. M. Reest, F. Earle, G. Hancock, H. Roskrige (Devonport), W. J. Jenkins (Bodmin), and Harbottle Reed, hon. secretary (Exeter). The hon. secretary (Mr. Harbottle Reed) presented the annual report, which, among other matters, referred to the Plymouth, Devonport, and Stonehouse branch having asked for the support of the society in their action with regard to paid officials undertaking private work. They were authorised to send a letter to the various local authorities in the name of the architects practising in Plymouth, Devonport, Stonehouse, and surrounding district, as represented by the Three Towns branch of the Devon and Exeter Architectural Society, pointing out that professional men labour under great hardship and disadvantage from such action, and which they submit is also prejudicial to public interests. The memorial also suggests that those authorities which require plans to be submitted should discourage the acceptance of any plan not signed by an architect or surveyor. The council of the society were asked to make suggestions with regard to a competition for designs for a drinking fountain and clock tower at Exeter, and several of the suggestions had been adopted. The roll of membership now stood as follows:—Members, 1897, 49; 1896, 43; associate members, 1897, 11; 1896, 13; associates, 1897, 16; 1896, 16; honorary members, 1897, 4; 1896, 3; total, 1897, 79; 1896, 75. One member and one associate had retired. The adoption of the report was moved by Mr. Cole, seconded by Mr. King, and carried. A satisfactory balance in hand was shown in the statement of accounts presented by the hon. treasurer (Mr. O. Ralling). A prize, given by the society for measured drawings, won by Mr. J. H. Vincent (Plymouth), was presented by the president, Mr. Thorne, who then gave an interesting address, and proposed as his successor Mr. James Hine, of Plymouth. Mr. Luff seconded the nomination, and Mr. Hine was duly elected. Mr. Hine then took the chair, and thanked the members for electing him, probably, he said, on account of his being the senior member of the profession in Plymouth, though not the oldest in the county, as he believed that claim belonged to Barnstaple. Mr. James Crocker (vice-president), was re-elected, as were Mr. O. Ralling (hon. treasurer), and Mr. Harbottle Reed (hon. secretary). Messrs. C. King (chairman of the Three Towns branch, Plymouth), Mr. G. S. Bridgeman (Paignton), and Mr. C. J. Tait (Exeter) were elected members of the council. In the afternoon a visit was made to the harbour extension works at Keyham, where the members were received by Mr. Elliot, superintendent civil engineer, who conducted the party over the site, and minutely explained the works being carried out by Sir John Jackson, whose contract will probably amount to about £3,000,000.

The Select Committee of the House of Lords, appointed to consider the Hastings Harbour District Railway scheme, have decided that the preamble of the Bill has not been proved. By this scheme over six miles of railways were proposed to be constructed by a new company from Hastings Old Town to Ore, Silverhill, and Hollington, forming junctions with the South-Eastern Railway. In connection with this scheme a parade and sea-wall were proposed to be constructed. The share and the loan capital of the proposed company was to be £300,000.

The London County Council has, says *London*, had to deal with upwards of 1,500 applications for leave to erect Jubilee stands. In no single instance have the County Council allowed a stand to be erected on the public way, or in such a manner as would interfere with the view of the people in the streets. The Council also insists that all stands shall be of substantial build, to prevent the possibility of accidents. Where balconies are proposed they require that each one shall be securely shored up. They also insist on extra support for all floors and roofs which are intended to carry an unusual number of people. The Council is having all structures erected under the personal supervision of the district surveyors. The largest stand on the line of route will probably be that at St. Saviour's Cathedral, where 2,000 are to be accommodated.

## LEGAL INTELLIGENCE.

THE ST. PANCRAS WORKHOUSE ARBITRATION IN THE APPEAL COURT.—T. DREW-BEAR, TOLPUIT, AND BROWN V. THE ST. PANCRAS GUARDIANS AND A. AND C. HARSTON.—This remarkable and protracted case came before the Master of the Rolls, Lord Justice A. L. Smith, and Lord Justice Chitty, sitting as the Court of Appeal, on Monday and Tuesday last, as an appeal by plaintiffs from the order of Justices Grantham and Wright, made on April 13. Sir Robert Reid, Q.C., M.P., with whom were Mr. Reginald M. Bray and Mr. Alfred A. Hudson appeared for the plaintiff-appellants; Mr. F. A. Bosanquet, Q.C., with whom were Mr. English Harrison and Mr. W. Moyses for the respondents, the board of guardians; and Mr. MacIntyre watched the case on behalf of Messrs. Harston. It will be remembered that the action was a claim by a committee of trustees, as creditors of William Brooks, a builder, of Folkestone, against the guardians of the poor for St. Pancras and their architects, Messrs. A. and C. Harston, of 15, Leadenhall-street, E.C., for a balance of £24,226, or alternatively £24,265, alleged to be due on a building contract for the rebuilding of portions of St. Pancras Workhouse. The case originally came before Mr. Justice Cave, who, after a part-hearing, regarded these issues as so complicated, that he ordered it to be referred to arbitration. It was then heard by Mr. Edward Ridley, Q.C. (now Sir Edward Ridley, one of her Majesty's judges), then the Official Referee, at the Old Bankruptcy Buildings, Portugal-street, the sittings extending from July of last year till March 17 last, when judgment was given for the plaintiffs against the guardians with costs, the damages to be ascertained hereafter, on the ground that they failed to give the contractors and his trustees possession of the site at the specified time. Judgment was also entered for the architects against the plaintiffs with costs. The successive headings of that arbitration and the judgment were fully reported in our issues of July 17 and 24, and November 20 and 27, 1896 (pp. 93, 133, 755, and 769 last volume), January 22 and 29, and March 5, 12, and 19 last (pp. 149, 185, 365, 379, and 413 current volume). In the Court of Queen's Bench on April 13 last, Mr. Justice Grantham and Mr. Justice Wright, sitting as a Divisional Court, heard an appeal by the guardians against the Official Referee's decision, and decided that it ought to be set aside, with costs, and that the whole case should be re-tried before another Referee. Against that decision of the Divisional Court the plaintiffs now appealed. In opening the case for the plaintiffs, Sir R. T. Reid said the arbitration occupied the attention of Sir Edward Ridley, then the Official Referee, for no fewer than 22 days, and it would obviously be a very serious matter if all the complicated issues then raised should have to be gone over again. He would very shortly state the circumstances. The plaintiffs, the appellants, were various builders' merchants, the creditors in bankruptcy of one William Brooks, builder, of Folkestone; and the defendants, the respondents, were the guardians of the poor for St. Pancras, and their architects Messrs. Arthur and Christopher Harston. Brooks contracted with the guardians to rebuild the workhouse premises in continuation of work already begun by Messrs. Kirk and Randall, contractors, of Woolwich, and abandoned by that firm by mutual consent, from plans by Messrs. Harston, the architects and sole arbitrators under the contract. Difficulties arose, the builder became bankrupt; but the creditors, having satisfied themselves that the contract afforded a margin of profit, completed it. When the work was almost finished, the guardians took possession, and the question of what might be due to the creditors was the subject of the arbitration before Mr. Ridley. These were the classes of complaint by the creditors—firstly, that there had been delay by the guardians in gaining possession of the site, and that by retaining the use of portions of the old building, the builders were hindered in the execution of their work; and, secondly, an allegation of dishonesty against the clerk of works and the architects in rejecting material and work, and in impeding the progress of the contract. While, according to the contract, some £49,300 worth of work was done by plaintiffs, they claimed about half as much again, or £65,479 as the actual value, exclusive of profit as due. Very voluminous evidence was given, and in the event the Official Referee decided that while he felt strongly that the decisions given by Mr. Harston as arbitrator under the contract were not capable of justification, he was acting to the best of his ability as arbitrator under the contract, and that as there was no evidence that he had been guilty of fraud, dishonesty, or collusion, the action was not maintainable against him. The action, therefore, so far as regarded the architects, was dismissed with costs, and this, Sir R. Reid said, he would freely admit was against him. As to the guardians, the Official Referee decided that the delay in giving possession of the site entitled the contractor to set aside the contract, and that the plaintiffs would be entitled to consider the matter on a *quantum meruit*, or, alternatively, to

damages, which would have to be determined at some future time. It should be borne in mind that the damages had not yet been assessed; but he believed it would be admitted that the damages accruing from not giving up the ground at the specified time had been agreed upon at about £1,400. Judgment was, therefore, for the architects, and against the guardians, in each case, with costs. No express finding appeared in the judgment as to the clerk of works, although in the course of the case the learned Referee spoke strongly as to his conduct and evidence. The Master of the Rolls: The guardians would be liable for the acts of the clerk of works if he were dishonest. Sir R. T. Reid agreed that that would be so; but in his judgment the Official Referee did not express any opinion on the point. He added that a crucial point arose as to the Official Referee's decision that, owing to the alterations in the contract, the plaintiffs were justified in claiming a *quantum meruit*. The Master of the Rolls: I should think a *quantum meruit* represents measure and value. Sir R. T. Reid: Yes; under these circumstances *quantum meruit* would be the legal, and measure and value the ordinary building phrase. The guardians moved the Divisional Court to set aside this judgment. No attempt was made before that Court to go into the evidence; but on the legal arguments the Court said that they had made up their minds that the judgment must be set aside, and the case re-heard by another Official Referee. Lord Justice Chitty: Of course, it cannot come before the same Referee, as he is now Mr. Justice Ridley. Sir R. T. Reid: I do not know whether the learned judge might not wish to hear this case argued in his present capacity; but when this judgment was pronounced he was still a Referee. In reply to the Master of the Rolls, he added that in any case the damages and amount due would have to be ascertained by the process of *quantum meruit*. He held that the judgment of the Divisional Court was wrong, and that the judgment of the Official Referee must stand. The learned counsel then read, *in extenso*, the conditions of contract and the judgment of the Official Referee. Continuing his address on Tuesday, Sir Robert drew attention to clauses in the revised conditions of contract which he contended provided that when Brooks took up the work, he was to commence immediately with section 2, and to proceed with it without delay—whereas he was unable to obtain possession of large portions of this site; but as to section 1, which was nearly completed, he was to be given possession at the discretion of the master and the architects. The Master of the Rolls said surely the contractor did not expect to have all the inmates turned out without notice. Sir Robert Reid agreed that they could not; but the master had arranged to withdraw the inmates from any portion needed within forty-eight hours. The result of the delay was that a building contract which should have been completed in fifteen months dragged over nearly thirty-one months. Mr. Bray continued on the same side. The Master of the Rolls said they might have, as Mr. Bray was alleging, to get possession of one block to go on with others, and the builder possibly might have matured all his plans for dealing with the buildings and site as a complete whole, as Mr. Bray was further arguing; but he did not believe a word of it. Mr. Justice A. L. Smith: Roughly speaking, the building was to cost £50,000, and do you say it cost £20,000 more owing to the delay in gaining possession? Mr. Bray said part of the extra outlay was due to this cause, but part was due to interference by sub-contractors, and by interference by the architects and clerk of works. The Master of the Rolls expressed incredulity as to the great amount of additional cost occasioned by the delay in obtaining the site. Mr. Bray proceeded to argue that the decision of the Arbitrator should be upheld. Mr. Bosanquet, Q.C., for the respondents, said the real point was whether the learned Official Referee had not misdirected himself, and if he had not given judgment on a wrong basis. The Master of the Rolls asked whether he wished the case to be re-tried before a fresh arbitrator, because that was what the Divisional Court decided. Mr. Bosanquet was proceeding with his argument when the Master of the Rolls said his brethren and himself were all agreed that there was not sufficient evidence of delay in giving possession to constitute such a breach of contract that would justify them in deciding that the plaintiffs should recover as though there had been no contract on a basis of value of work; but there might be sufficient delays to cause the plaintiffs some damage, and if so, whether that damage should be ascertained by some person to be hereafter appointed, was the point the Court would have to consider. Counsel argued that the original complaint of the plaintiffs did not so much refer to the delay in gaining possession, but to the interference of the clerk of works and architects, and that the learned Referee in confining his attention in his judgment to the former matter had misdirected himself.—In giving judgment the Master of the Rolls, having recounted the leading circumstances of the action, continued: The case had to be considered just as if the builder had



himself gone on with the contract and finished it, as the creditors had completed it. The work had been done, and unless something had arisen to the contrary, the agreed price ought to be paid. But the plaintiff had said, first of all, that he was not bound by the agreed price, that there had been breaches of the contract by the guardians, or by those for whom they were responsible, and that those breaches were to such an extent and of such importance that they had made the original agreement inapplicable to what had been done, and that, therefore, the case was now to be taken as if the contract had never existed. The new agreement, if that were true, was that the builder has done work for the creditors with their assent and upon the terms, of course, that he was to be paid. But paid what? Under that new agreement there was no fixed price, and if that contention were true, therefore, it would be work done upon the terms that the builder was to be paid, but without anything being said as to the prices. As everybody knows, if that were the contract, the payment thereunder would be upon a *quantum meruit*. But the plaintiffs had said more than that. They had said that they have a cause of action by way of alternative, and that they were entitled, under the new course of procedure, to have an alternative recompense. What was it? It was that, supposing the contract to show good as a contract, he was entitled to be paid the agreed price, but he claimed damages beyond that agreed price, although the contract had not been done away with. The guardians had committed breaches of contract for which they were liable in damages. The case also charged the architects to the guardians, as independent defendants, with fraud—with fraudulent conduct in their office, and there was a clause which foolishly and without any justification whatever charged the guardians themselves with being fraudulent. This case was tried before Mr. Ridley, then the Official Referee, just as if it had gone before a judge without a jury. When the case went to trial that foolish allegation in the pleadings as to fraud by the guardians themselves was never opened, and was never relied upon as part of the case against them. The plaintiffs did, however, labour to show that the architect had acted fraudulently. How? Partly when he was called on to arbitrate between the builder and the guardians, and partly by giving orders as to the works as architect and not as arbitrator, and in that acting fraudulently; and they charged the clerk of works with having fraudulently colluded with the architect. If the parties had done nothing more, it would have been the duty of Mr. Ridley not only to try the question of liability, but that if he held there was a liability, to have gone on and tried the question of damages. But the parties agreed that the Referee should try the question of liability first, the damages to stand over. The question before the Court was not whether there was evidence of this or that thing, but whether it agreed with the decision to which Mr. Ridley came. Mr. Ridley held that there had been breaches of contract so extensive as to have made the condition of things under which the work was done so different that the original contract was done away with, and that it was done upon the terms that the plaintiffs should be paid a *quantum meruit* sum. Assuming that the Official Referee was right in holding that there were very considerable breaches of the contract by the defendants, there was no alteration of the work to be done. But the Court did not agree with the extreme view that Mr. Ridley took: that the work was so altered in nature that the original contract was not applicable to it. The breaches did not go to that length. Therefore he (the Master of the Rolls) could not agree with Mr. Ridley that the payment for the work done was to be on a *quantum meruit* in that sense. But there was the alternative case which was attempted to be proved before Mr. Ridley: that against the architects for fraud. That action failed, Mr. Ridley held, and the architects were entitled to the costs of the action brought against them individually. Neither side had appealed against that decision, and it must stand. Then Mr. Ridley found that there had been a breach of the contract by the guardians in not giving possession of No. 2 section, and this breach entitled the plaintiffs to damages. This contract in No. 2 section was a written one; but there was no great difficulty in construing it. It was clear to him (the Master of the Rolls) that the guardians undertook to give up the whole site immediately, and he could see no ground for saying that they were only to give the builder the possession of such portions as he asked for. They did not give it him on May 31, 1892, and Mr. Ridley had found that the builder did complain. It was said that he did not complain to the guardians themselves; but how was the builder to know what their names were, or where they were to be found? He did complain to the clerk of the works, and as the guardians did not then give possession, they were responsible, as they had broken the contract. He (the builder) must show the damages which had occurred, supposing that they existed. They would be such as if he had entered into contracts on the faith of this being given up to him, immediately, and had suffered by being obliged to

paying for materials at once, and not when wanted. Then if he engaged labour, he had to pay the labourers, and they would be on his hands. Further, materials would be seriously damaged by being kept, and not used. It must be taken that there was some damage. But the plaintiffs said they were further inconvenienced by not having open space in which to work, and by interference by other contractors. This might well be one head of damage. They also said that the fraud of the architects delayed them in their work in two ways—by giving wrong orders with regard to the work, and by compelling them to undo that which had already been completed. But they forgot that the work was "all to be done to the satisfaction of the architect," and that however erroneously the architect might have exercised that duty, the builder could not sue the guardians for that, as they had abandoned the charge of fraud. Then they said that the clerk of works improperly objected to work. They put it "dishonestly." He could not see any ground for a charge of dishonesty; but that the clerk of works acted obstinately and erroneously as far as it was possible for him to act, he (the Master of the Rolls) believed, and this coincided with Mr. Ridley's view. But if the clerk of works acted wrongly, the builder ought to have referred that misconduct of his to the architect to act as arbitrator. If it was said that by doing so the builder bound himself in slavery, he ought to have considered that when he entered into the contract. He could not recover for any default of the clerk of the works against the guardians. Therefore the only damages in respect of which the builder were such damages as he could prove to be the result of delay in giving possession, and for interference by other contractors. Therefore he (the Master of the Rolls) did not agree in the whole decision of Mr. Ridley; but as to the alternative case, he thought he (Mr. Ridley) was right in finding liability on behalf of the defendants. Then, by consent of the parties, the amount of the liability had yet to be considered; but it ought to be proved by plaintiff in the way suggested. The mode they adopted in the appeal—namely, to say "the contract price was £50,000; the doing of the work cost us £70,000, therefore the damages must be the difference between £50,000 and £70,000"—was altogether wrong. As to the decision of the Divisional Court, he (the Master of the Rolls) did not desire to say anything more disrespectful of it than this: that he did not understand it. Even if he did, on what possible grounds, when a case had been decided by a judge without a jury, when he had heard all the evidence, when he had come to a conclusion upon that evidence and certain findings, could it be said that because they did not agree with him—that was, because they thought he was wrong—therefore there should be a new trial, in which all the evidence would have to be gone over again? He could not think that that was the right way to deal with the case, which had been decided by a judge who had duly considered, and had come to a decision—right or wrong—upon the evidence before him. The result was that the plaintiffs, before Mr. Ridley, did prove a cause of action. They proved a contract and a breach of that contract; therefore it was a simple case which had now to be tried—namely, what was the amount of damages on the question of liability? Then Mr. Ridley had decided that the defendants were to pay all costs. That Court did not interfere with the decision of such a judge as to costs unless they thought that he had determined the costs upon a wrong principle. Now he could not help thinking that Mr. Ridley did make his order as to costs upon the broad footing that he thought that this contract was wholly done away with, and that, therefore, payment was to be on a *quantum meruit*. Inasmuch as he (the Master of the Rolls) had ventured not to agree with Mr. Ridley in that, he thought the costs must have been given on a wrong principle. The defendants must pay the general costs, of course; they would have to pay all costs of evidence given on the question, whether there was delay; they would have necessarily, at the end, to pay all these costs, whatever might be the amount of damages which the plaintiff might recover; but they ought not to pay any costs in respect to the charge of fraud which the plaintiffs brought against the architects, nor on any resulting claim for delay caused by such fraud. The architects' claim for costs must be taxed at once, including the costs of the motion. With regard to the costs of this appeal as between the plaintiffs and defendants, their Lordships thought the decision of the Court below was wrong. Sir Robert Reid had urged that the decision of Mr. Ridley was right, therefore as, on the whole, both sides half won and half lost, there ought to be no costs on either side of this appeal. Lord Justice A. L. Smith, in concurring, said that the case of "Bush v. Whitehaven Commissioners," on which Mr. Ridley had relied, did not apply. Lord Justice Chitty also concurred. He understood that the Official Referee, or perhaps he should say his brother Ridley, had intimated his willingness to try the question of damages, should the Court wish to refer that matter back to him. The Master of the Rolls

added that the Court had paid no attention at all, except to wonder at it, to the objection that was taken that Mr. Ridley would not properly try this case if it went before him again. In reply to Mr. Bosanquet, his Lordship added that the costs of the Divisional Court belonged to Sir Robert Reid. Mr. Bosanquet's clients had pressed the judges to give a decision which was absolutely wrong. Theirs was a horrid bad order. Mr. Bosanquet: I could not help that, my lord. The Master of the Rolls: Oh, yes you could; you did it, I am sure you did. Mr. Bosanquet: I was not there myself, but I will take the responsibility. The Master of the Rolls said the respondents must pay the costs in the Court below. The appeal was accordingly allowed, with the costs as stated.

**SECTION 53, METROPOLIS MANAGEMENT ACTS.—FIFTH v. STAINES.**—This case was heard in the Queen's Bench Division last week, before Mr. Justice Hawkins and Mr. Justice Wright. It was a special case stated by a Metropolitan magistrate. The appellant was a sanitary inspector in the employment of the vestry of St. Leonard, Shoreditch. The vestry, which was the sanitary authority for the parish, had under section 51 of the Act of 1855 appointed a committee, known as the Public Health committee, for the purpose of carrying out the provisions of various sanitary Acts of Parliament. The question in this case was as to the meaning of section 58, which empowers the local bodies named therein to appoint committees for any purposes, which, in the discretion of the local body, would be better regulated and managed by means of a committee, "provided always that the acts of every such committee should be submitted to the general body of the board or vestry appointing such committee for their approval." A report having been made to the committee of the existence of a nuisance on the respondent's premises, the committee by resolution authorised the appellant to serve a notice on the respondent under section 85 of the Act, requiring him to abate the nuisance. This was done, and the respondent having disregarded the notice, a summons was issued against him. The approval by the vestry of the proceedings was not obtained until after the issue of the summons, and the magistrate held that, as the resolution of the committee had not been submitted to the vestry for their approval before the service of the notice, the notice was invalid, and he dismissed the summons. The Court allowed the appeal. Mr. Justice Hawkins said that in his opinion the decision of the magistrate was wrong. The case turned on section 58 of the Metropolis Management Act, 1855, which gave to the vestry the power of appointing the committee. It was clear, when section 58 was looked at in connection with sections 82 to 85, which dealt with the abatement of nuisances, the committee had the same power in those matters as the vestry, subject to the approval of the "acts" of the committee by the vestry. It was said that in this case the vestry should have judicially considered the matter, and given their approval before the issue of the notice. He could not help thinking that if a committee was appointed to do acts which in the judgment of the vestry could be better done by a committee than by a vestry, then the term "approval" was used advisedly as meaning that, although the committee could do the acts in question, they could not justify themselves unless at some time or other the approval of the vestry was obtained. Otherwise the result would be that the approval of the vestry must be obtained prior to each step in the proceedings, and if that was so there might just as well be no committee at all. Moreover, if the committee could do no act without the approval of the vestry, then there could be no act done by the committee of which the vestry could approve. Mr. Justice Wright delivered judgment to the same effect.

**A CARDIFF BUILDER'S MISSING WILL.**—In the Probate Division of the High Court of Justice on Saturday (before Mr. Justice Barnes) the case of Parfitt v. Parfitt and others was heard. The suit had reference to the testamentary dispositions of Mr. Elijah Parfitt, a builder, who had resided at Cardiff and Bristol, and died on May 8, 1896. The plaintiff, Mrs. Ann Parfitt, widow of the deceased, claimed probate of the contents of a will dated the 14th of March, 1882, by which all her husband's property was left to her, but which document could not now be found. The defendants, Elijah Sheppard Parfitt, Mary Ann Parfitt, and Emma Fanny Jevons, opposed the claim, alleging that the will was not duly executed. Mr. Justice Barnes said he believed the will was properly executed, and that the plaintiff was entitled to probate of the copy. As the defendant, Elijah Sheppard Parfitt, was the last person who had possession of the will, and did not produce it, he must be condemned in costs. His lordship accordingly pronounced for the will.

At the Llandudno Urban District Council on Wednesday, Lord Mostyn wrote that it was his intention, in commemoration of the Queen's Reign, to give a site for new municipal buildings, valued at £5,000.



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## ILLUSTRATIONS.

NEW TOWN HALL, GOVAN.—HOUSE AT HASLEMERE.—  
PASSMORE EDWARDS PUBLIC LIBRARY, ST. GEORGE'S-IN-THE-EAST.—COTTAGES AT GREENBANK, DARLINGTON.

## Our Illustrations.

PROPOSED NEW TOWN HALL AND MUNICIPAL BUILDINGS, GOVAN.

THIS design, which has been chosen for execution, was worked out in strict accordance with the conditions of competition issued, and in the following report it is desired to draw attention to the following points:—Arrangement of plan.—Ground floor: The entrance to municipal buildings to be from Govan-road, the council chamber being placed directly in centre of entrance, with an ante-room between the entrance-hall and council chamber, lit from roof; this will be a great convenience, and will also prevent any noise from hall reaching the council chamber. Beyond there are double-doors also, to prevent any noise being heard in the chamber. To the right of the ante-room is placed the cloak-room and lavatory, while to the left there is a retiring-room. The council chamber is lighted from roof, and there is a recess at each side for the members of the council; the entrance to the gallery for the public is from Merryland-street. There is a stair placed at each side of entrance—the one leading from the offices fronting Summertown-road, and the other from those fronting Merryland-street. The burgh officer's room is placed at the entrance, where he can see everyone entering; this position is also convenient for anyone entering who requires to make any inquiries. The provost's room is placed at the corner of Govan-road and Merryland-street, while the committee-room fronts Govan-road. The town clerk's office fronts Govan-road and Summertown-road. The burgh treasurer's office faces Summertown-road, and has an entrance for the public from same, the public office being directly in front of this entrance for the convenience of the public calling to pay taxes. The weights and measures inspector's office is placed in Merryland-street, with a separate entrance to the workshops from Sande-street. The main entrance to large hall is from Summertown-road, where passages are placed at both sides under gallery for the purpose of getting to the front seats in area without going through the hall, also to conduct to the various exits when the public are retiring; the entrances to small hall are also from Summertown-road. First floor: The burgh surveyor's office is placed fronting Merryland-street, and facing north. The cleansing inspector's office faces Govan-road. The sanitary inspector's office for the most part faces Summertown-road, with access direct from the street to hot and cold bath and lavatory. The small hall is placed in Summertown-road, with the necessary cloak-rooms and lavatories, also retiring-rooms with w.c.'s. Attic: The janitor's house is placed in the second story, with entrance from and facing Merryland-street; a storage or lumber-room is also placed in central dome. Basement: In the basement is placed the

kitchen and scullery, with convenient coal-house and coal-shoot, the kitchen being so placed that it communicates with both halls by means of a lift. The heating chambers are also provided, each having a coal-house and coal-shoot, the one to serve the municipal buildings proper, and the other the halls; there is also storage accommodation for town clerk's office, fireproof vault for books in connection with burgh treasurer's office, two workshops, fire and draught-proof room, and lavatory for weights and measures inspector's department. The heating to be by hot-water saddle boilers being placed in basement, from which the hot water will be conducted in 4in. pipes (low pressure), flow and return to the radiators placed in the window-bossing of the various rooms. The foul air is to be taken through fireclay pipes built in walls to extract ventilators placed in roofs. Messrs. Thomson and Sandilands are the architects.

## HOUSE AT HASLEMERE.

THIS house, herewith illustrated by photographs exhibited at the Arts and Crafts Exhibition, was built by Messrs. Maides and Harper, of Croydon, for Mr. Lewis Wigram. Materials: Red brick, red tile, and Portland stone; the lead is all cast. The grounds have all been laid out to go with the house, and are the joint work of the architect, Mr. Ernest Newton, and Mr. Hawkes, of Old Queen-street, Westminster. The details and plans are from the working drawings kindly lent us by the architect.

PASSMORE EDWARDS PUBLIC LIBRARY,  
ST. GEORGE'S-IN-THE-EAST.

THIS building, illustrated to-day from the architect's drawing, now on view, on the line, at the Royal Academy, is about to be built on a corner site in Cable-street, adjoining the Vestry Hall of St. George's-in-the-East, and the cost of its erection has been generously undertaken by Mr. J. Passmore Edwards. The site has been purchased by the Library Commissioners. The main feature of the plan in this library is formed by the unusually large public reading-room located to the rear, a spacious apartment 46ft. square, and roofed by a steel-constructed dome filled in with fibrous plaster spandrels, and having a lantern over for light and ventilation. The reference-room occupies the entire length of the frontage on the first floor, with three large oriels, as seen in the perspective. The plan shows the general arrangements on the ground floor. The boys' room, 23ft. 6in. by 19ft. 6in., is to the left of the entrance-hall, and the borrowers' counter is on the right, on the same side as the Commissioners' room and Librarian's office. Filing and staff-rooms are in the basement, and a caretaker's residence, with separate entrance and staircase, is provided. The front is in red brick, with lime stucco on the first floor; the entrance porch and cornice and other dressings of Portland stone. The grouping of the chimneys has been contrived so as to obviate interfering with the return wall and cornice of the Vestry Hall, and to anticipate other limitations imposed by the conditions of the site and its surroundings. The London County Council have approved of the plans, and the work will be proceeded with at once by the Vestry. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

## COTTAGES AT DARLINGTON.

THESE cottages have recently been erected near the north entrance to West Lodge, Darlington, the residence of Sir David Dale, Bart., D.C.L. The buildings are of red brick of local make, with specially-moulded Normanby deep red brick stringcourses, arches, &c. The gables are all built with half-timber work and cement, rough-cast; the roofs are covered with Dinorwic grey slates and red ridge-tiles. The whole of the work has been carried out by Mr. R. T. Snaith, of Darlington, from the designs, and under the supervision of, the architect, Mr. C. E. Oliver, F.S.I., of Shotley Bridge.

The Hull stipendiary heard a case on Thursday in last week in which a contractor was charged with infringing the by-laws of the corporation. It was shown that the builder of cottage property in Plane-street had, instead of using genuine mortar, employed worthless rubbish ground up by machinery. Inasmuch as the same offender had been warned upon twenty-three previous occasions, Mr. Tuniss considered that the regulations had been systematically set at defiance, and imposed the full penalty permitted.

## COMPETITIONS.

**BURNLEY.**—In the competition for a memorial fountain to be erected in the Queen's Park, Burnley, the design submitted by Mr. John W. Boyd, 10, Third Avenue, Newcastle-on-Tyne, has been placed first.

**GUERNSEY.**—With reference to the 20 competitive designs submitted for the proposed New States Assembly Hall, the plans have been submitted to, and carefully examined by, Mr. Aston Webb, one of the vice-presidents of the Institute of British Architects, the professional assessor appointed by the president of the Institute, and he has awarded the premium of £100 to the author of the design whose motto is "V. R.," and that of £50 to the author of the design whose motto is "Saumarez." These awards have been approved of, and confirmed by the States committee but must finally be submitted to the States for their approval and sanction. A meeting of the States will be held on or about the 28th of this month, when the question will be dealt with.

**SUNDERLAND.**—The Borough of Sunderland Technical School competition award was made by Mr. J. M. Brydon, nominated by the Council of the Royal Institute of British Architects to act as referee, and his recommendation has been confirmed by the corporation, with the result that the first premium of £100 has been given to Messrs. Potts, Son, and Hennings, of Ely-place, E.C.; the second prize of £50 to Messrs. Woodhouse and Willoughby, Manchester; and the third premium of £25 to Mr. H. W. Wills, of Swansea. The cost of the buildings in the instructions to architects was restricted to £18,000. The 5 per cent. agreed to be paid to the architect appointed to carry out this work is to include railway fares and hotel expenses, besides measuring-up and valuing extras and omissions. A bargain is a bargain; but such conditions as these are not "usual," and they are not generous, neither are they calculated to advance the best interests of those who insist upon such overreaching terms, against which, in common fairness, we protest. We shall illustrate the chosen designs shortly.

**WANDSWORTH.**—In the competition for the proposed Nurses' Home at the workhouse infirmary at East Hill (which closed on April 2), the guardians of the Wandsworth and Clapham Union have received a large number of designs, which are now being considered by a special committee of the board.

## CHIPS.

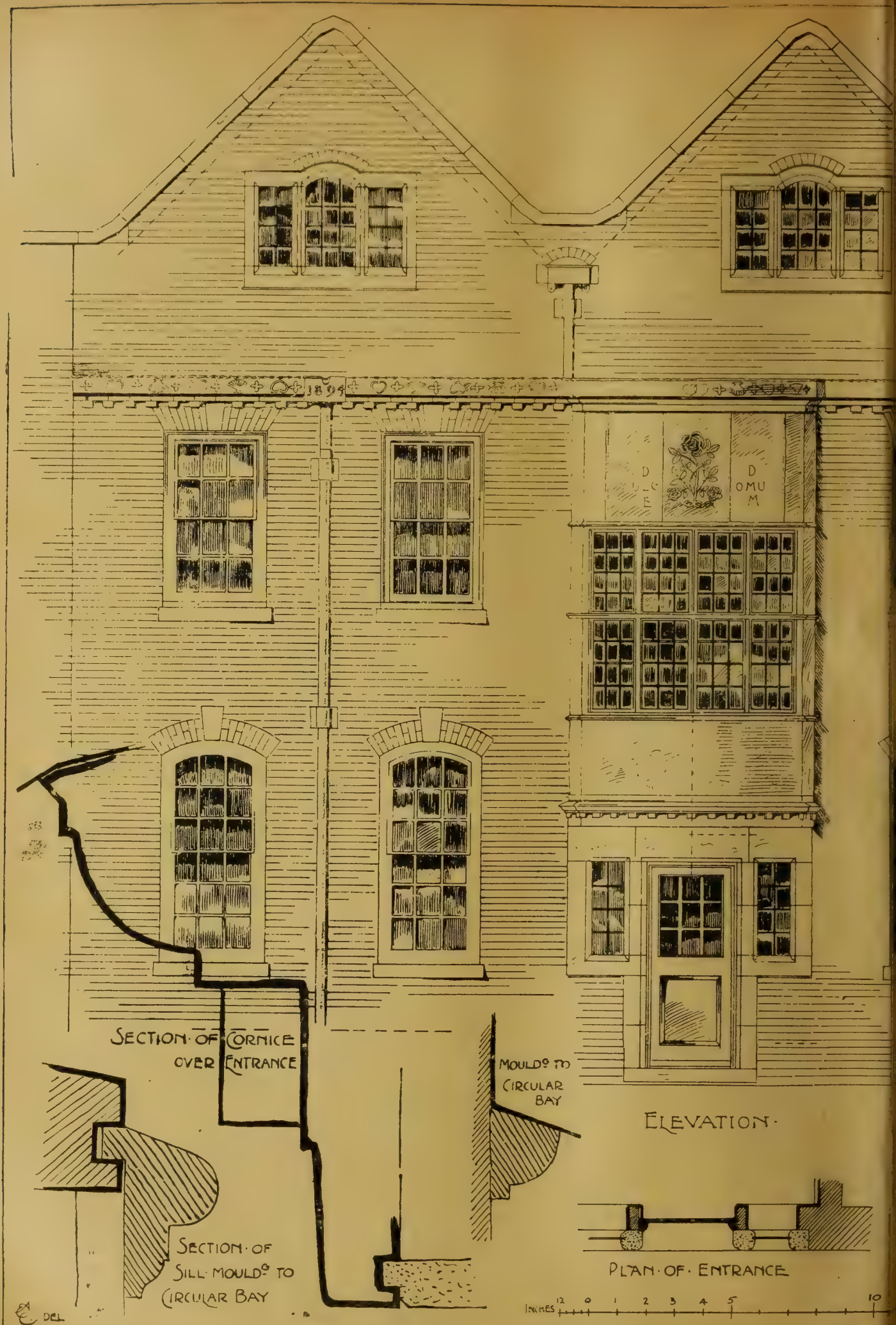
A portrait of Mr. James Hunter Dickson, the oldest member but one in the Glasgow Corporation, was formally presented to the Corporation Art Galleries of that city on Friday as a mark of his fellow-citizens' esteem. The portrait was painted by Mr. W. Q. Orchardson, R.A.

The question of rural housing is to be discussed at a conference that a committee of the Land Law Reform Association is organising for Tuesday next at the Westminster Palace Hotel. Sir Walter Foster, M.P., will preside, and it is expected that Sir H. H. Fowler, M.P., Mr. James Bryce, M.P., Sir Robert Reid, M.P., Mr. Herbert Gladstone, M.P., Mr. F. A. Channing, M.P., Mr. R. J. Price, M.P., Mr. F. W. Wilson, M.P., and Mr. F. S. Stevenson, M.P., will take part in the conference, together with a number of parish councillors and others who are interested in the question.

A meeting of the Parks, Gardens, and Improvement Committee of the Liverpool City Council was held on Friday, when the chairman (Alderman Ball) submitted a scheme of an improvement of Christian-street. This embraces the widening of that thoroughfare nearest Islington, and the carrying of it through to St. Anne-street, at a point near St. Anne's Church, Birkett-street, Richmond-row, and Great Richmond-street being intersected. The cost is estimated at about £75,000. Approval was given to the project by the committee, and it will come before the council in due course for sanction.

A pulpit, erected in the nave of Canterbury Cathedral as a memorial of the late Dean Payne Smith, was formally unveiled on Saturday afternoon in the presence of a large number of the subscribers. The pulpit, which was illustrated in our issue of January 1st of the present year, has been designed by Mr. G. F. Bodley, A.R.A., and constructed by Messrs. Rattee and Kett, of Cambridge. The carved panels have been executed by Messrs. Farmer and Brindley, London. It is of English oak, on a stem and base of Berbeck marble, and is erected against one of the piers on the north side of the nave.







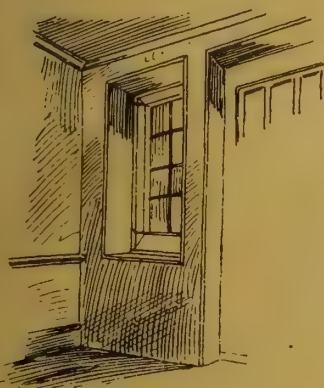
S, MAY 21, 1897.

# HOUSE AT HASLEMERE SURREY.

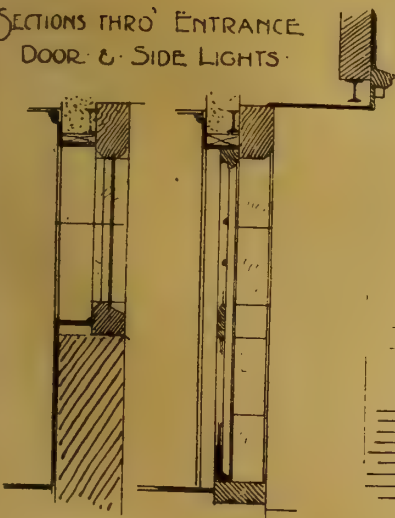
## DETAILS OF THE SOUTH FRONT.

ERNEST NEWTON ARCHT

SKETCH OF  
INSIDE OF FRONT DOOR



SECTIONS THRO' ENTRANCE  
DOOR & SIDE LIGHTS

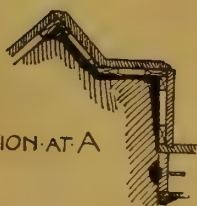


ELEVATION OF OCTAGONAL BAY.

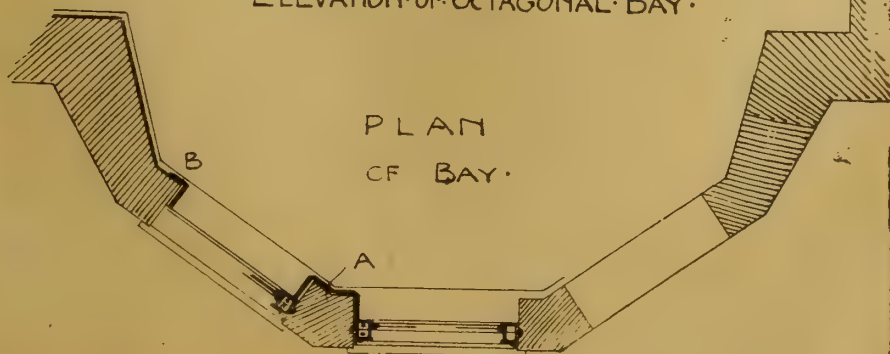
SECTION  
AT B



SECTION AT A



PLAN  
OF BAY.



15 20 FEET



## Building Intelligence.

**BATH.**—A meeting of the Building Committee in connection with the art gallery scheme has been held, at which it was decided to commission Mr. J. M. Brydon, F.R.I.B.A., of London, to commence at once preparing an elevation of the proposed building, and it was an instruction to him that in preparing the plans he should make such provision that in the event of the Holburn Trustees deciding to bring their collection to this more central site, accommodation in one part of the building should be arranged so as to give them entire control over that portion without interference from the committee of the art gallery. The entrance to the proposed building will be at the Pulteney Bridge corner. The art gallery will consist of one large room, 89ft. long by 34ft. wide, while the room below, to be used as a reference library, will be 50ft. by 34ft., and a board-room and other accommodation in connection with the technical schools will occupy the remaining space. It is expected the plans will be ready in about a fortnight.

**GLASGOW.**—A block of municipal sanitary chambers has just been erected for the occupation of the officials in the employ of the corporation. The site is at the junction of Cochrane-street and Montrose-street, within 200 yards of the municipal buildings. Built of Overwood stone, the new building is three stories in height, with a square tower 70ft. high at the corner where the two streets join. The front elevations have been freely and ornately treated in the style of the Later Renaissance. The first story has rusticated courses and round-headed windows, forming a substantial base for the lighter and broader treatment of the second and third flats. Above the main entrance in Montrose-street is a statue of Hygeia, and over the main cornice the skyline is broken by a balustrade, interrupted at intervals by pediments and finials. In addition to the three stories there is a basement floor, which is devoted to storage purposes and accommodation for drain-testing and lime-washing apparatus and operators. Practically the whole of the ground floor is occupied by Mr. Peter Fyfe, F.R.S.E., the sanitary inspector, his assistants, inspectors, draughtsmen, &c., who number in all about 180. On the first floor Dr. Russell, the medical officer of health, and Dr. Chalmers, the junior officer, have their rooms, and accommodation is also provided for the veterinary surgeon and the other medical assistants. The rest of the story, and also the greater part of the second floor, is occupied by the inspecting sanitary officers. The square tower which surmounts the building is used as a chemical laboratory. The plans of the new chambers were prepared in the city engineer's office under the supervision of Mr. A. B. McDonald. The principal contractors were:—Masons, Messrs. Alexander Thomson and Son, Glasgow; joiners, Messrs. William McCall and Son, Glasgow; plumber, Mr. Matthew Sproul; and plasterers, Messrs. D. and J. Mackenzie. The site for the chambers cost £11,000, and the buildings about £19,000.

**NOTTINGHAM.**—The buildings of the Prudential Assurance Company, Limited, which form the junction of King-street and Queen-street, Nottingham, are now open for the transaction of business. The steep gradient, which affected both the plan and the elevation, has been utilised by the architects, Messrs. A. Waterhouse, R.A., and Son. There are entrances to the building on each side of the upper end of the slope, from King-street and from Queen-street; and in King-street is the entrance to the restaurant opened on Friday. This restaurant is in the basement of the building. The triangular hall, access to which is given from the main entrance, is covered by a glass roof, and galleries run along the sides of the hall to the various offices. A great portion of the building has been sublet, but the Prudential Company occupy the main floor. The building externally has a plinth of red Aberdeen granite 9ft. high at the tower end, with facings above of red Burmantofts terracotta and red bricks of special size. The tower roof is of lead, but on the other parts of the roof red Ruabon tiles form the covering, with slate on the flat internal slopes. The building was illustrated in the *Building News* for May 18, 1894, and the executive of the Operative Bricklayers' Society in London have obtained permission to inscribe upon their trade banner a copy of the design of this building as an illustration of the art of brickwork.

**WALTON, LIVERPOOL.**—The foundation-stone was laid on Saturday of a new Presbyterian Church at the corner of Rice-lane and Orrell-lane, Walton. The church will be of the Middle Gothic style, the material used being Yorkshire shoddies, with red stone dressings, and the principal entrances will be through an open porch, minor porch, and vestibule, as well as through cloak-rooms, &c. The inside length of the church will be 75ft.; the breadth across the body of the edifice, 37ft. 6in.; across the transepts, 40ft. 6in.; and the size of the organ-chamber, 19ft. by 9ft. About 450 sittings will be provided, and the plans permit the future erection of a gallery to give accommodation for another 100 seats. A vestry, session-house, infants' room, and ladies' room are also included, communication with the adjoining lecture-hall being obtained by two staircases, the hall being 50ft. by 31½ft., and capable of seating 300 persons. The sole contractors are Messrs. J. and G. Chappell; the masonry is in the hands of Mr. James McDermott; and the architect is Mr. R. G. Sykes, Fenwick-street, Liverpool.

### CHIPS.

The memorial-stones of a new church were laid on Saturday at Park Hills, Bury, in connection with the United Methodist New Church. The building is to cost about £2,500, and has been designed by Mr. J. D. Mould, of Manchester. It is to be Modern Gothic in style, and will seat 470 persons.

The Marquis of Dufferin and Ava has consented to lay, at Bristol on June 24, the foundation-stone of the Cabot Memorial Tower, to be erected by the people of Bristol, in conjunction with a committee of Americans, in celebration of the fourth centenary of Cabot's discovery of the northern continent of America. The tower, which will be 100ft. high, will be erected on Brandon-hill, overlooking the harbour. In excavating for the foundations, the workmen found beds of ashes in which were Early tobacco pipes and leaden bullets, evidently traces of the line of camp fires during the sieges of Bristol in 1643-4. Below these were massive stones set in cement, doubtless the foundations of the hermitage and chapel which stood on the hill top in the 14th and 15th centuries, and in the floor were graves containing parts of the skeletons of three adults.

The Archbishop of Canterbury, on Saturday, reopened the parish church of Cliffe-at-Hoo, near Rochester, after restoration, external and internal—of nave, aisles, porch, and parvise, with its turret staircase, and the fitting up of the north transept as a chapel with a second altar. The work also included a new roof over the south aisle, and the insertion of a heating apparatus. The restoration was executed under the direction of Mr. J. Arthur Reeve. Some interesting features hitherto hidden, including traces of coloured decoration of the nave walls and pillars, have been brought to light. The total cost was about £2,650, of which £1,080 remains to be raised.

The new sewerage works for St. Alban's were inaugurated by the mayor of that city last week. The scheme was formulated by Mr. G. Ford, the city surveyor. Apart from the contractors for the machinery, Messrs. S. H. Johnson and Co., of Stratford, and the erection of the engine shed by Mr. Sparrow, of St. Alban's, the whole of the work has been carried out by men employed by the city council.

A sculptured monument, designed by Mr. Basil Champneys, is to be placed over the grave of Coventry Patmore, the poet, in the cemetery at Lynton. It will consist of an obelisk placed on a square pedestal raised on three steps. There will be at each angle of the junction of the obelisk with the pedestal a sculptured lion.

On Wednesday week the parish church of Meare, near Glastonbury, was reopened after having been closed for five months while undergoing restoration under the direction of Mr. Buckle, diocesan architect. In 1870, the old square pews and three galleries were removed and the church reseated throughout. The chief feature of the present restoration has been in connection with the roof; the plaster ceilings of both aisles have been replaced with oak. The clerestory windows have been reglazed, and the stonework repaired.

At Pressburg an equestrian monument to the Empress Maria Theresa was on Sunday unveiled by the Emperor Francis Joseph, on the hill facing the Danube, where formerly the Kings of Hungary were crowned. The monument is the work of a young Hungarian sculptor. It is in white marble, and is 33ft. high. The more than life-sized figure of Maria Theresa, clad in the coronation robes, and wearing the crown, is seated on a Spanish horse, which rises as she draws in the reins. To the right and left of the horse stand a Hungarian noble and a National Guard.

### PARLIAMENTARY NOTES.

**BUILDING TRADES AND THE COMPENSATION BILL.**—In answer to Mr. Broadhurst (Leicester) on Monday, Sir M. W. Ridley said: Persons engaged in building works will come under the Bill or not according as steam machinery or the like is or is not used in the construction of the works. The distinction proposed in the Bill is roughly that which exists in the present law between factories and workshops, and further details are, I venture to think, questions for the Committee on the Bill.

The Great Western Railway contemplates taking advantage of the Light Railways Act of last session to construct a line running from Salisbury past Amesbury and on to Pewsey, with a station within three-quarters of a mile of Stonehenge.

The extensive cabinet works of Hunter, Hamilton, and Crawford, Lechwinnoch, near Glasgow, were completely destroyed by fire on Monday. The works comprised two buildings, each three stories high, and were stocked with valuable work. The damage, £7,000, is covered by insurance. 160 men are thrown idle.

As we have already intimated would be the case, Mr. Dibdin, the analytical chemist to the London County Council, and his chief assistant have both resigned their positions.

Mr. Aiken, the supervising architect to the United States Treasury Department, has resigned his post, at the request of the Secretary to the Treasury.

On Saturday the foundation-stone of the nave of St. Luke's Church, Deeplysh, Rochdale, was laid by Bishop Cramer-Roberts, in the presence of a large number of people. The eastern portion of the church was erected some ten years ago.

The Duke of Norfolk announced his intention on Wednesday to present to the city of Sheffield twenty acres of Roe Wood, in the district of Pitsmoor, for the purposes of a public park. The land is well wooded, and but for the transfer, would probably have fallen into the hands of the speculative builder. Its value is £20,000.

The foundation-stone of the new central block of the St. Marylebone Workhouse, Northumberland-street, W., was laid on Wednesday. The buildings, which are to be finished by April next and will cost between £50,000 and £60,000, will comprise administrative offices, committee-rooms, store-rooms, engine-rooms, and workshops, a dining-hall capable of seating 600, a chapel to hold the same number, and nursing and lying-in wards. Mr. A. Saxon Snell is the architect.

The death is announced of Mr. W. H. Dabney, a well-known architect of Boston, Mass. Mr. Dabney, born in the Azores, April 8, 1855, died April 29, leaving as the buildings with which his name will be most often associated, the Warren Chambers and the Trinity Court buildings, Boston, constructed while in partnership with Mr. H. B. Ball.

At Wednesday's meeting of the Vestry of St. Mary Abbott's, Kensington, the clerk reported the receipt of a communication from Mrs. Rutland Barrington intimating that the sisters of the late Lord Leighton had offered to present to the nation the house and all treasures of the late great artist, provided that suitable arrangements could be made for the acceptance of the gift and the maintenance of the property. The vestry were asked to nominate two or three representatives to attend a conference of authorities interested in the matter for the purpose of considering whether any scheme for the maintenance of the house, for the benefit of the parish, could be matured. Three members of the vestry were appointed to attend the conference, the date of which is to be fixed.

A United Methodist Free Chapel and schoolroom at Helsby, Cheshire, were opened on Wednesday week. The chapel was designed by Messrs. Fraser and Warburton, architects, Warrington, and the builders were Messrs. Davies and Sons, Frodsham. The building is in the Late English Gothic style, with the introduction of Renaissance features. The materials used are pressed Flemish bricks and Frodsham red sandstone. The body of chapel is 30ft. by 30ft., providing accommodation for nearly 200 people, besides choir gallery. At the back of the chapel is a schoolroom, measuring 30ft. by 31ft., divided from the chapel by revolving pitchpine shutters, and providing accommodation for over 120 children, or, if used in conjunction with the chapel, capable of seating between 300 and 400 people. The whole of the internal work and fittings are of pitchpine and varnished.

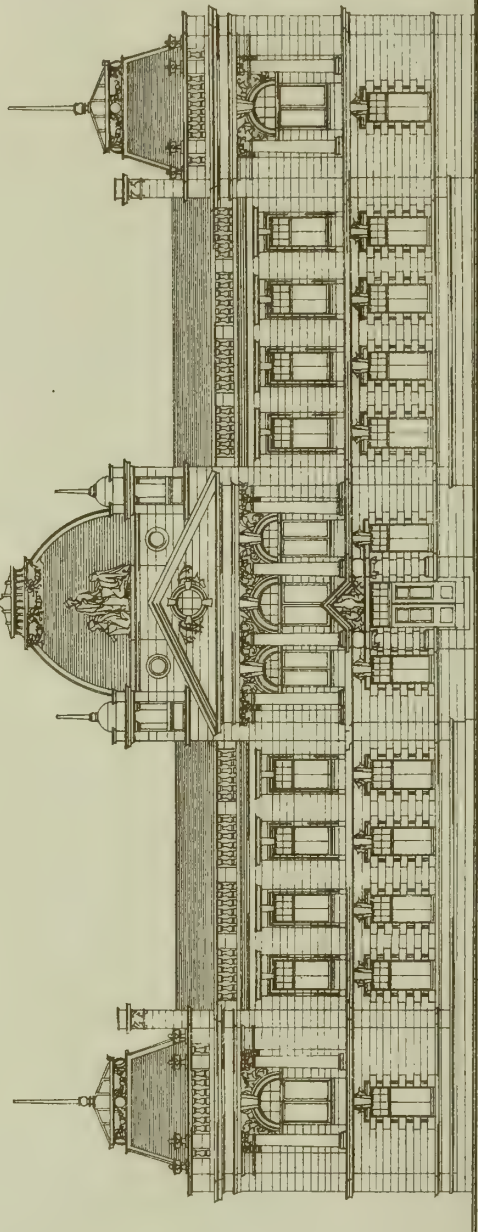
Evidence was given before the Select Committee on Government Contracts (Fair Wages Clause) on Friday by Mr. Robert Thurston, secretary of the Building Trades Association, who made complaints against some London contractors in the building trades, and stated that when they made charges the correspondence and the investigation took so long that the job was finished before the Department gave any decision.



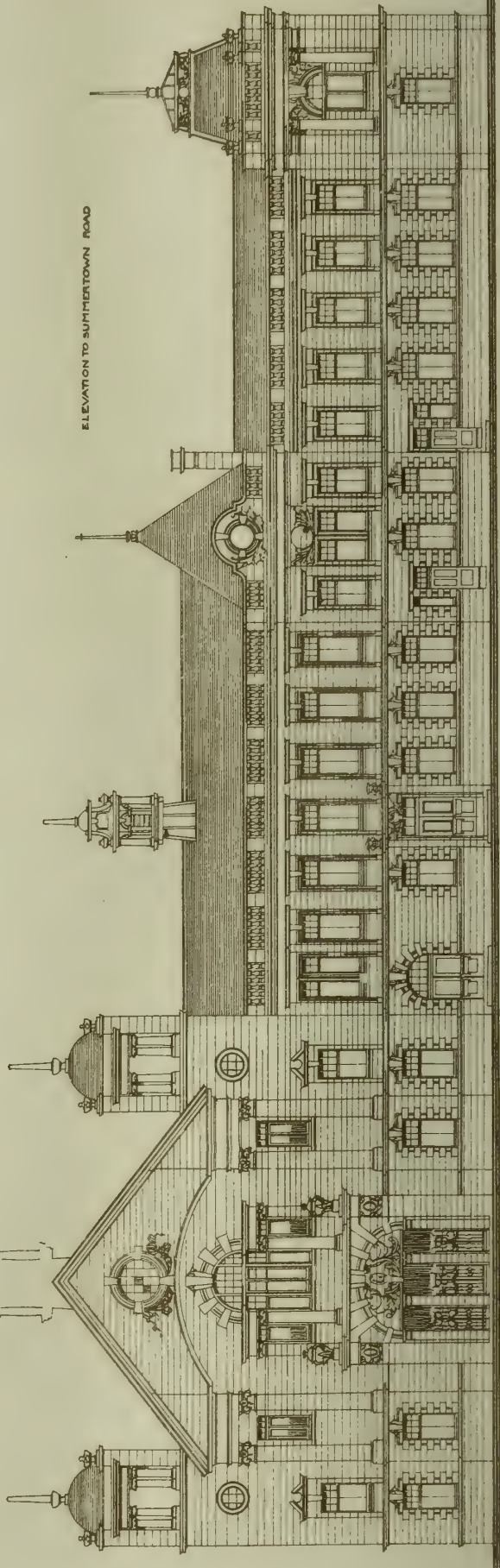




NEW TOWN HALL, GOVAN. SELECTED DESIGN, THOMSON & SANDILANDS, ARCHITECTS.



ELEVATION TO GOVAN ROAD

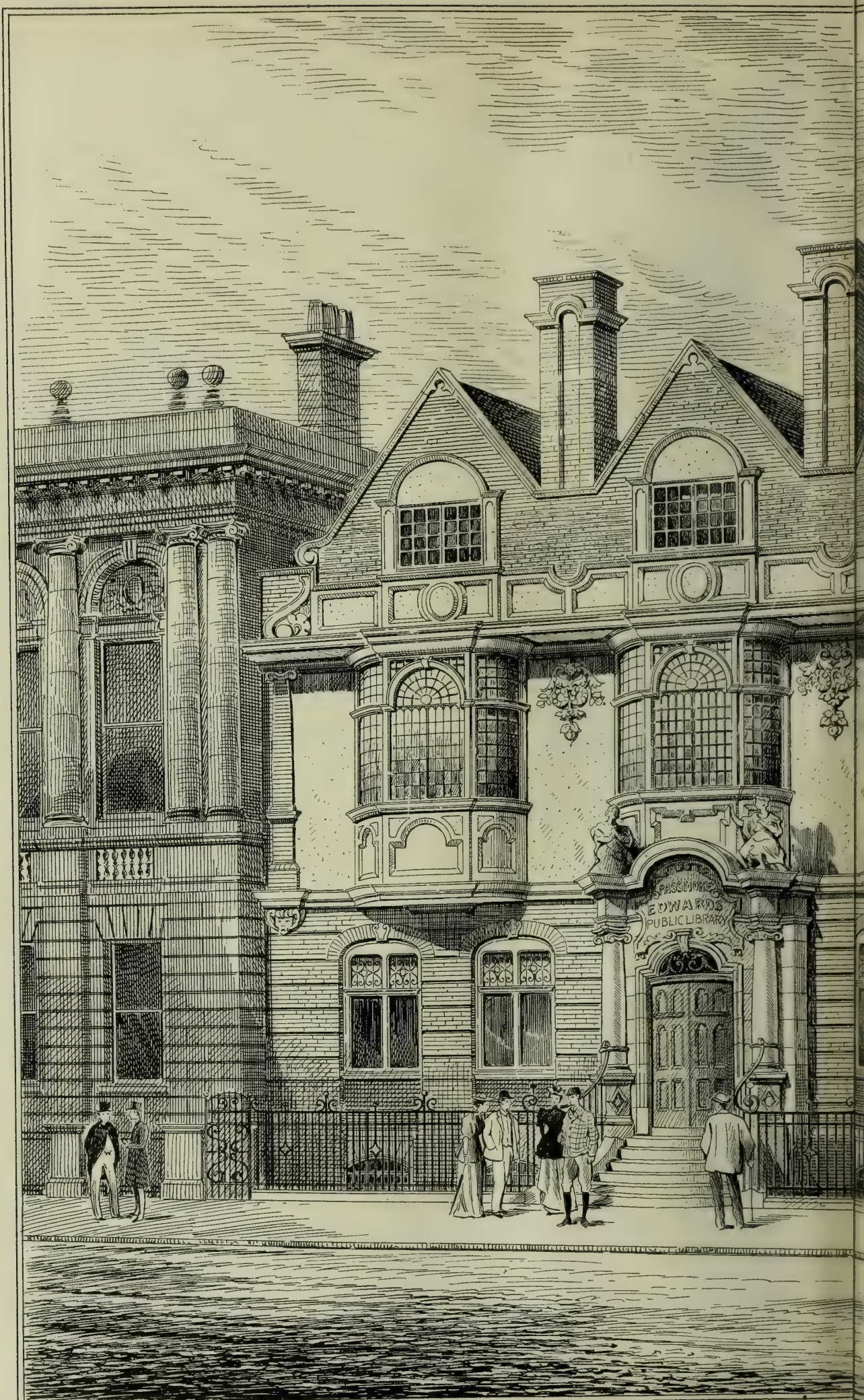


ELEVATION TO SUMMERTOWN ROAD



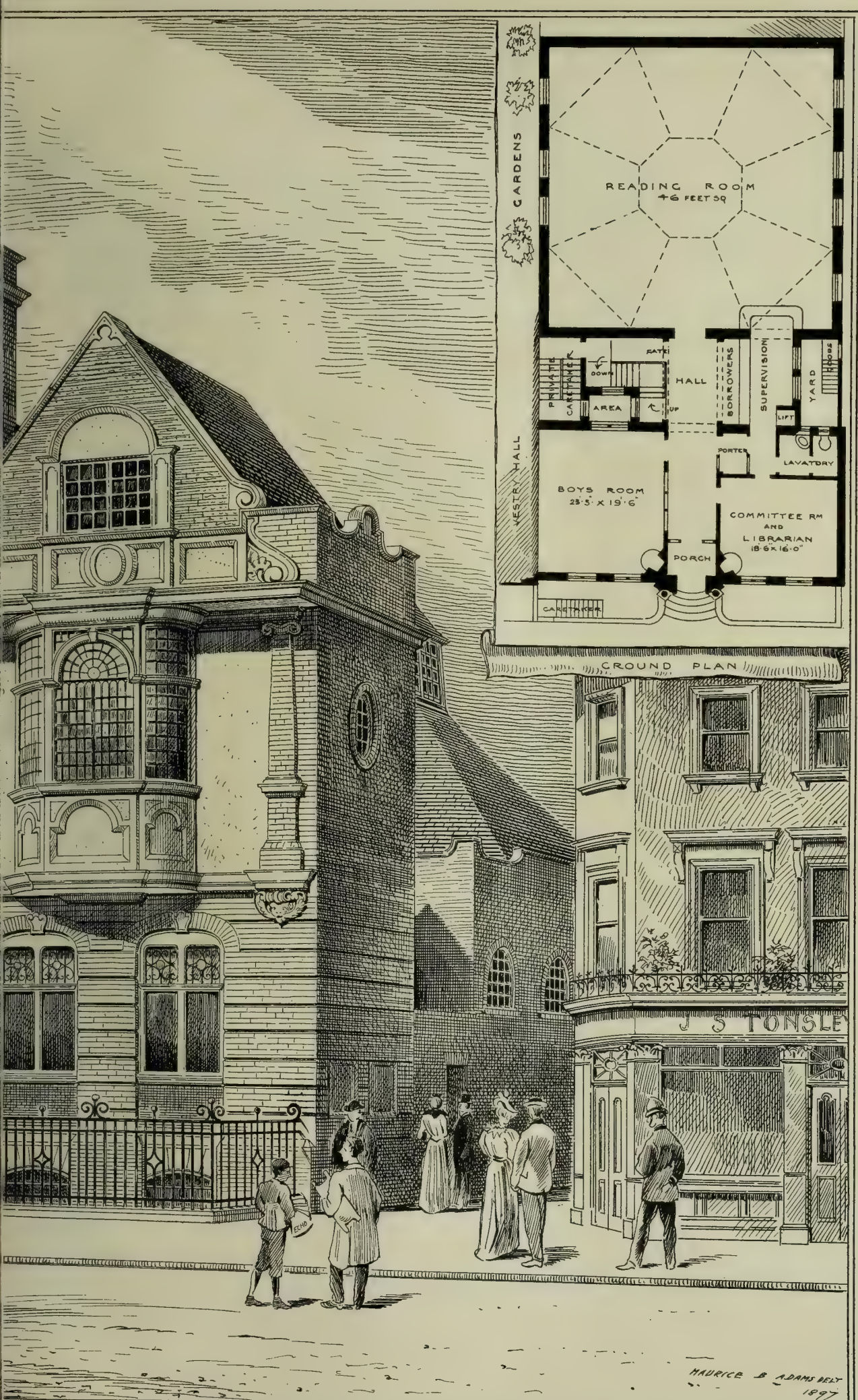






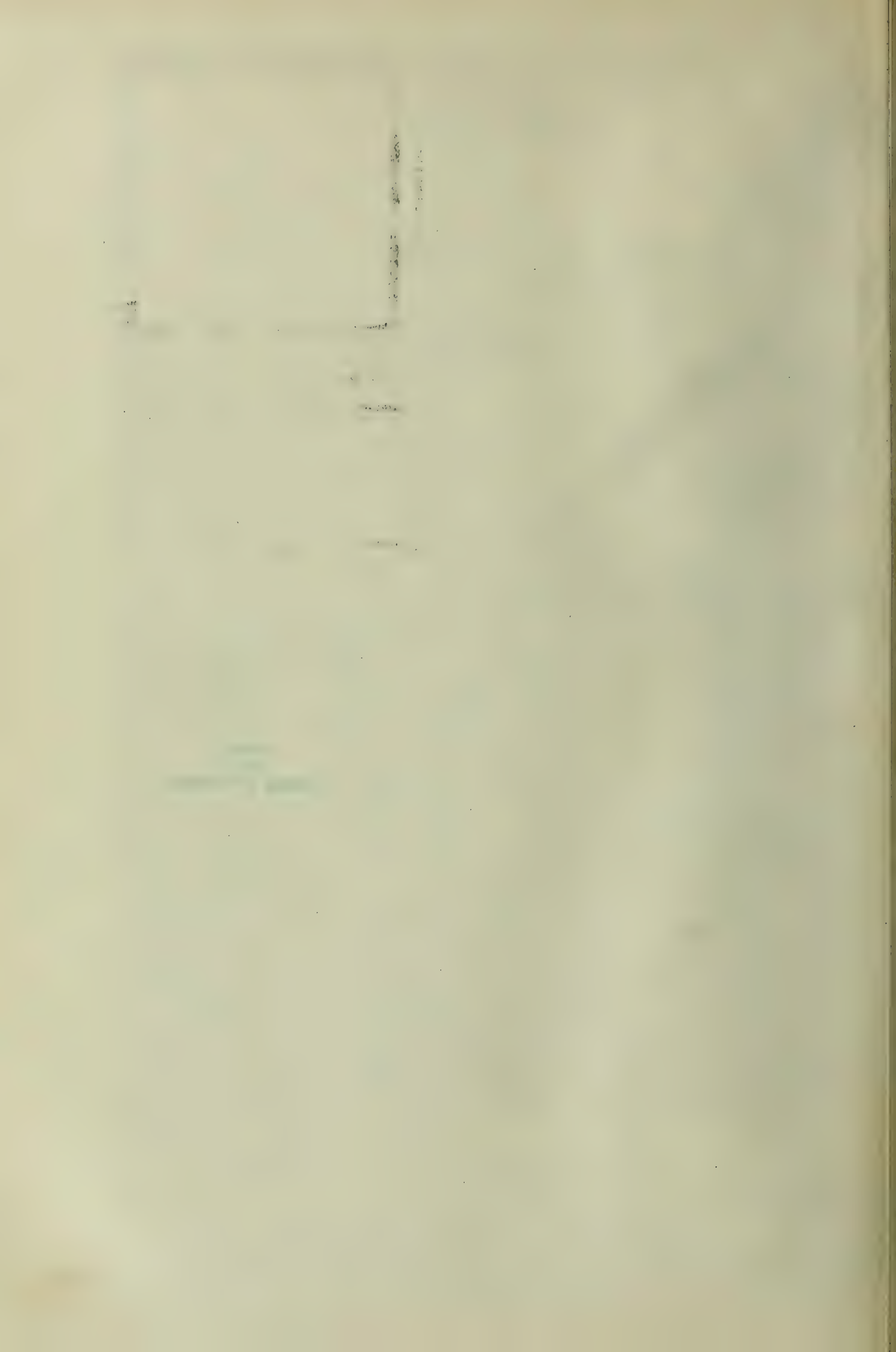
PASSMORE EDWARDS' PUBLIC LIBRARY SAINT GEORGE'S





THE EAST, CABLE STREET, SHADWELL. MAURICE B. ADAMS, ARCHITECT.

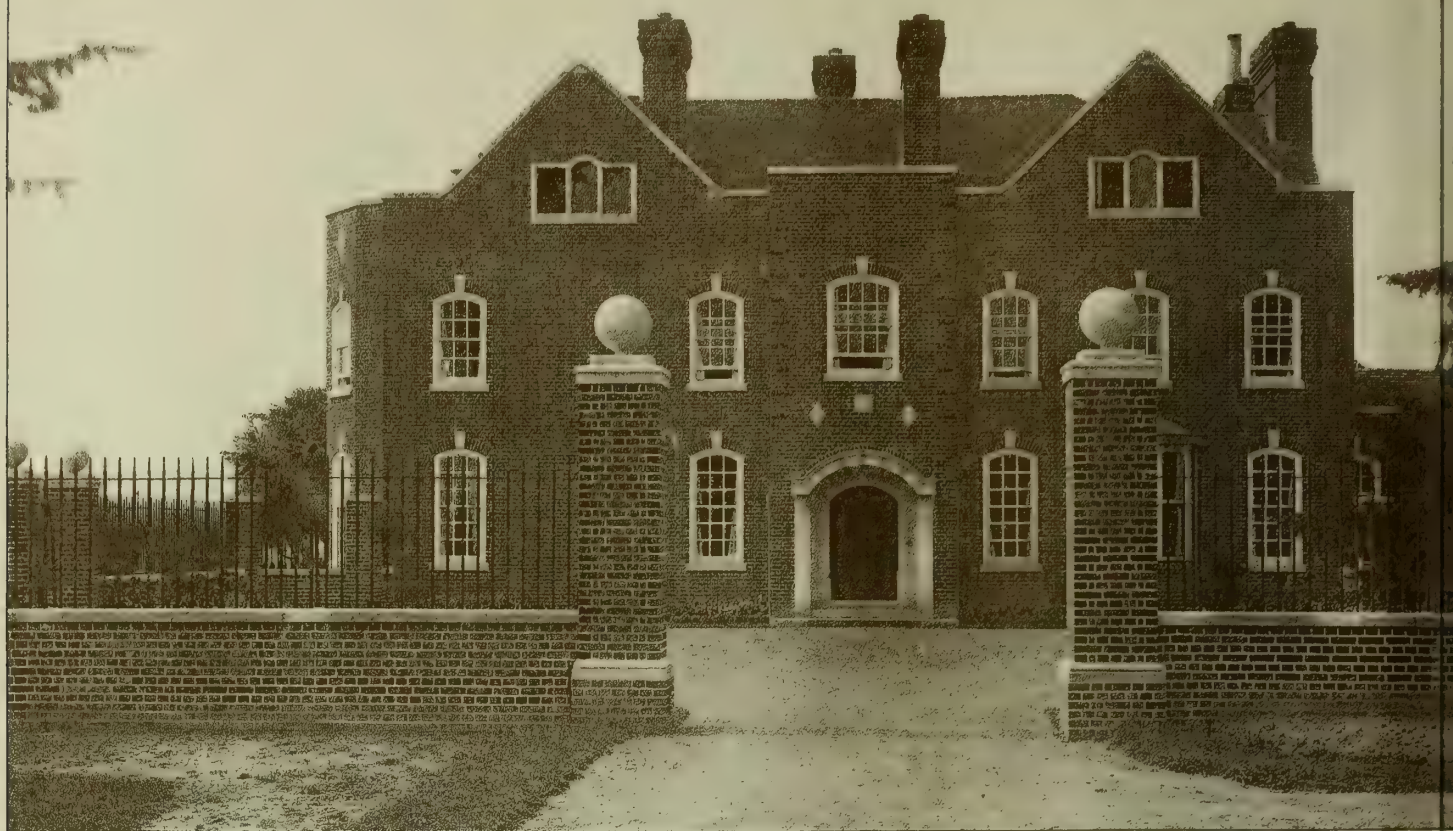










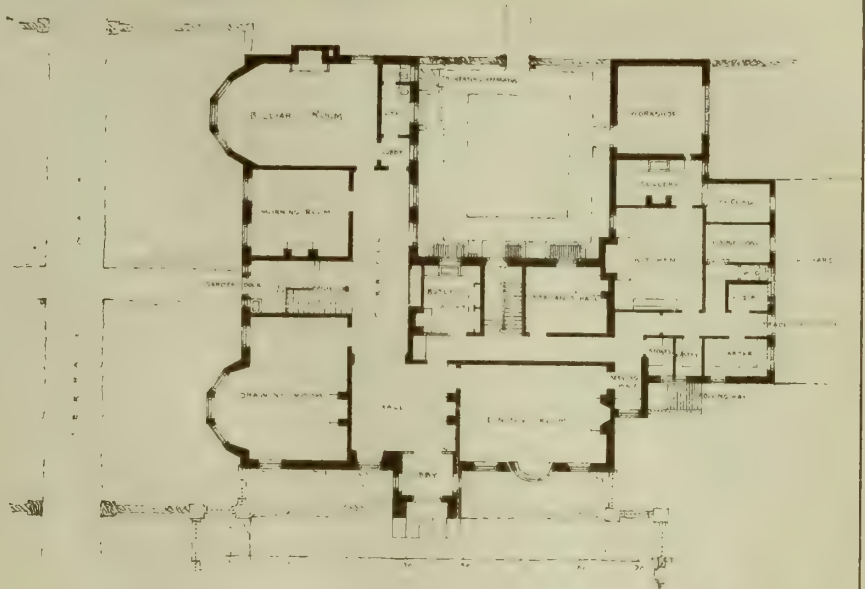




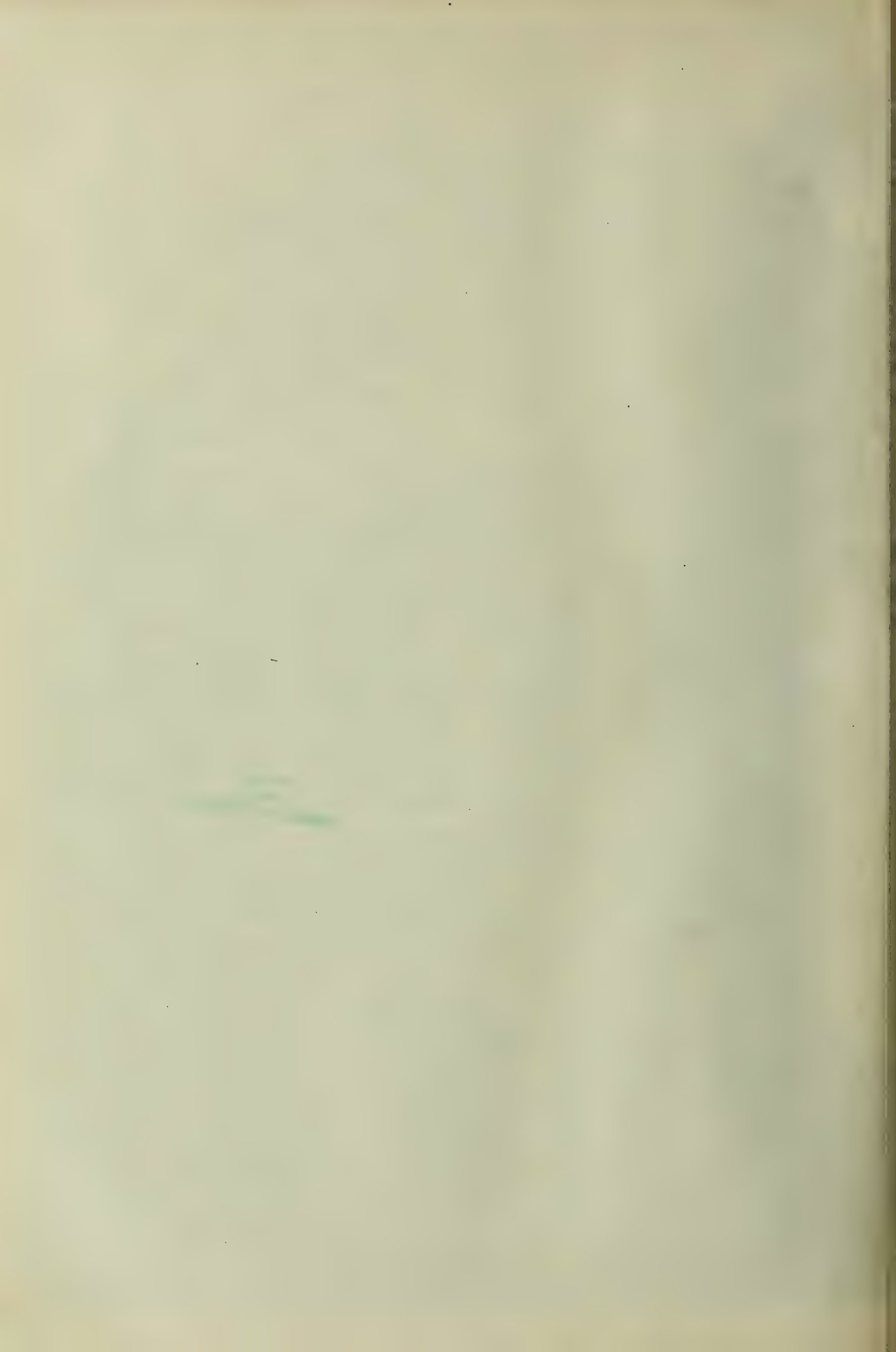
HOUSE AT HASLEMERE

SURREY

ERNEST NEWTON ARCHT



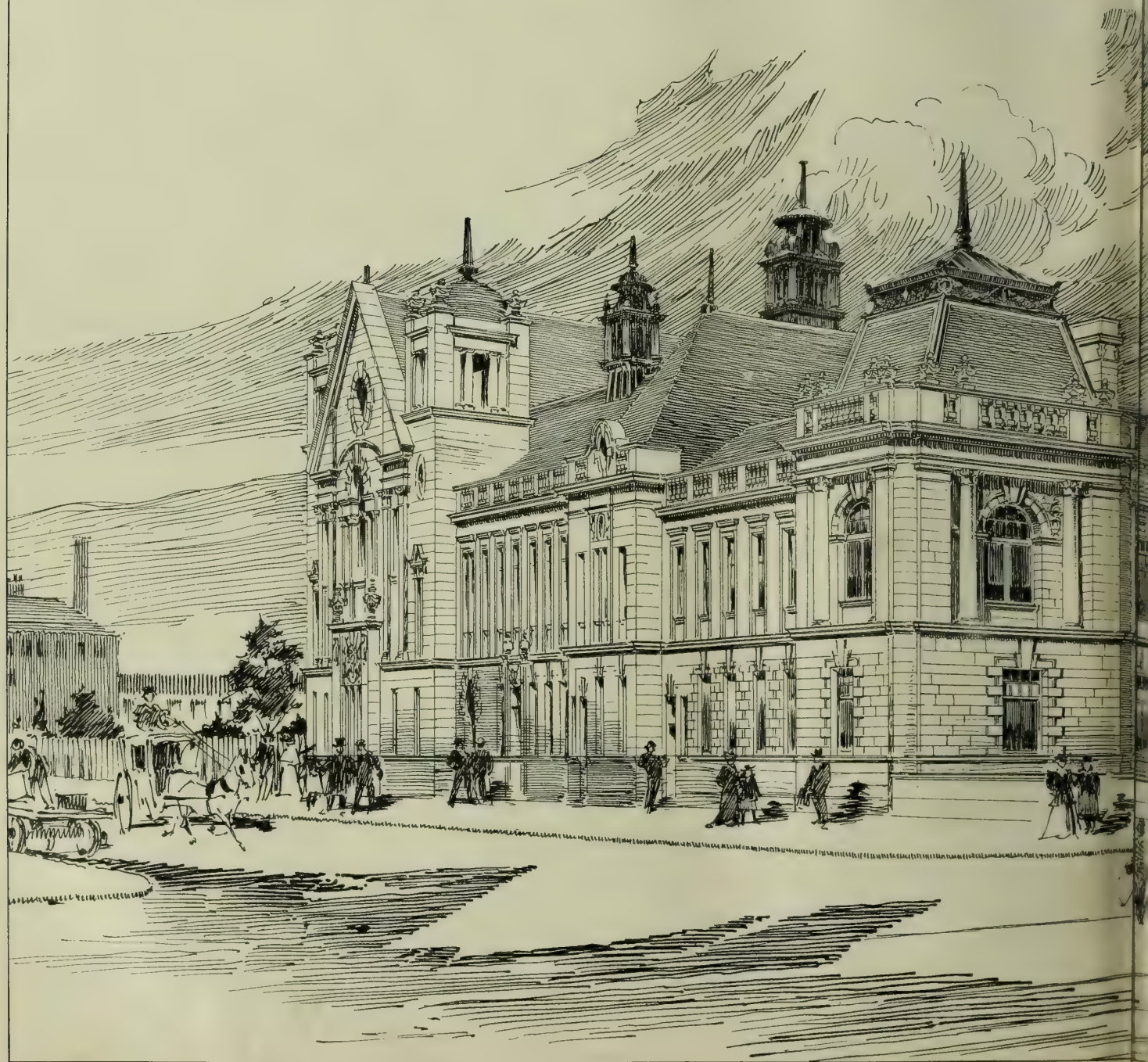
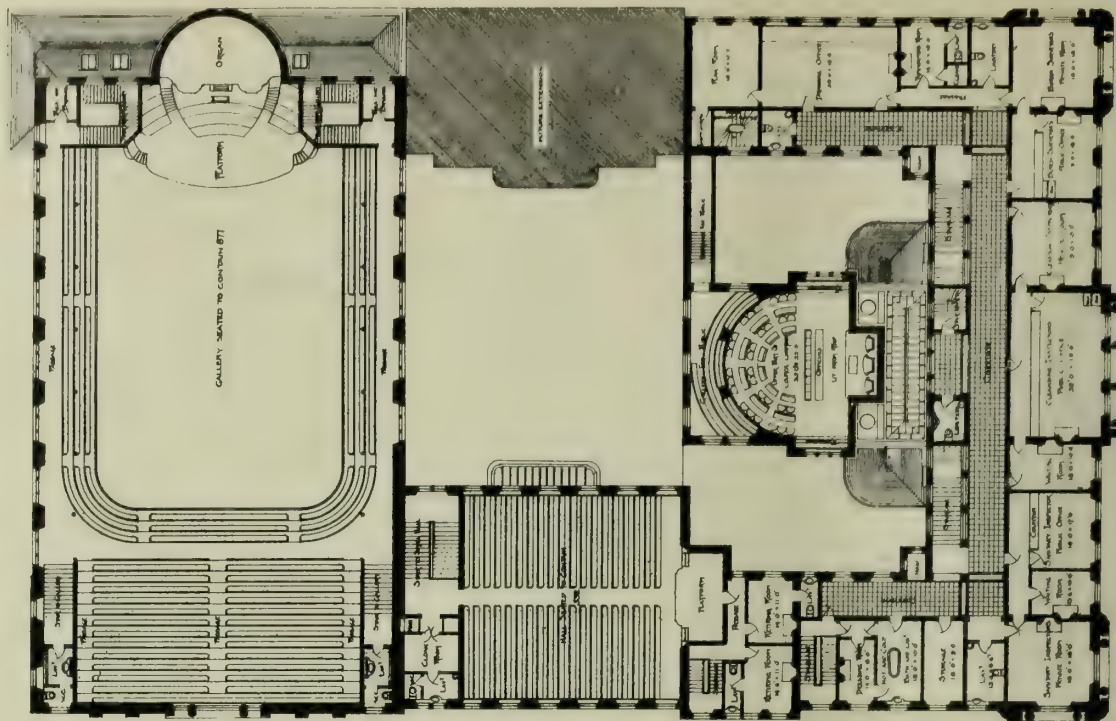




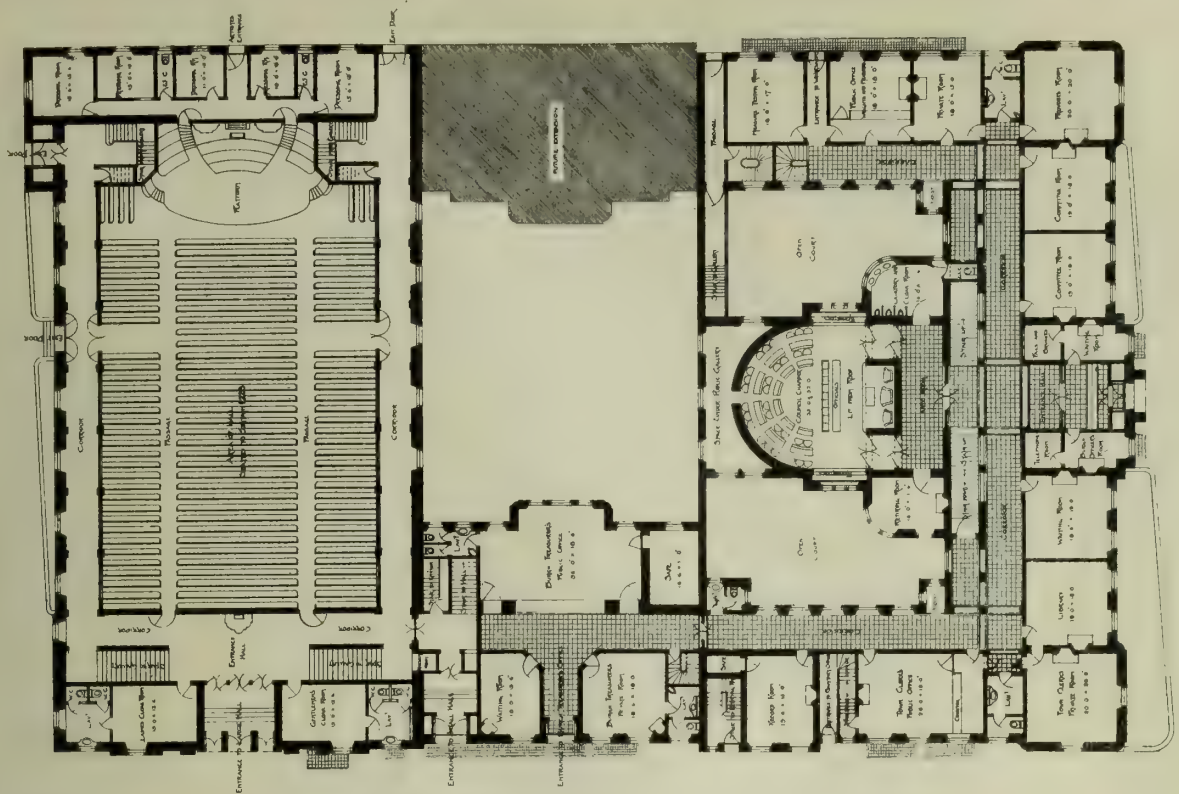










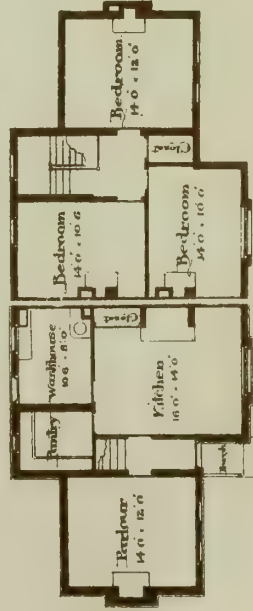
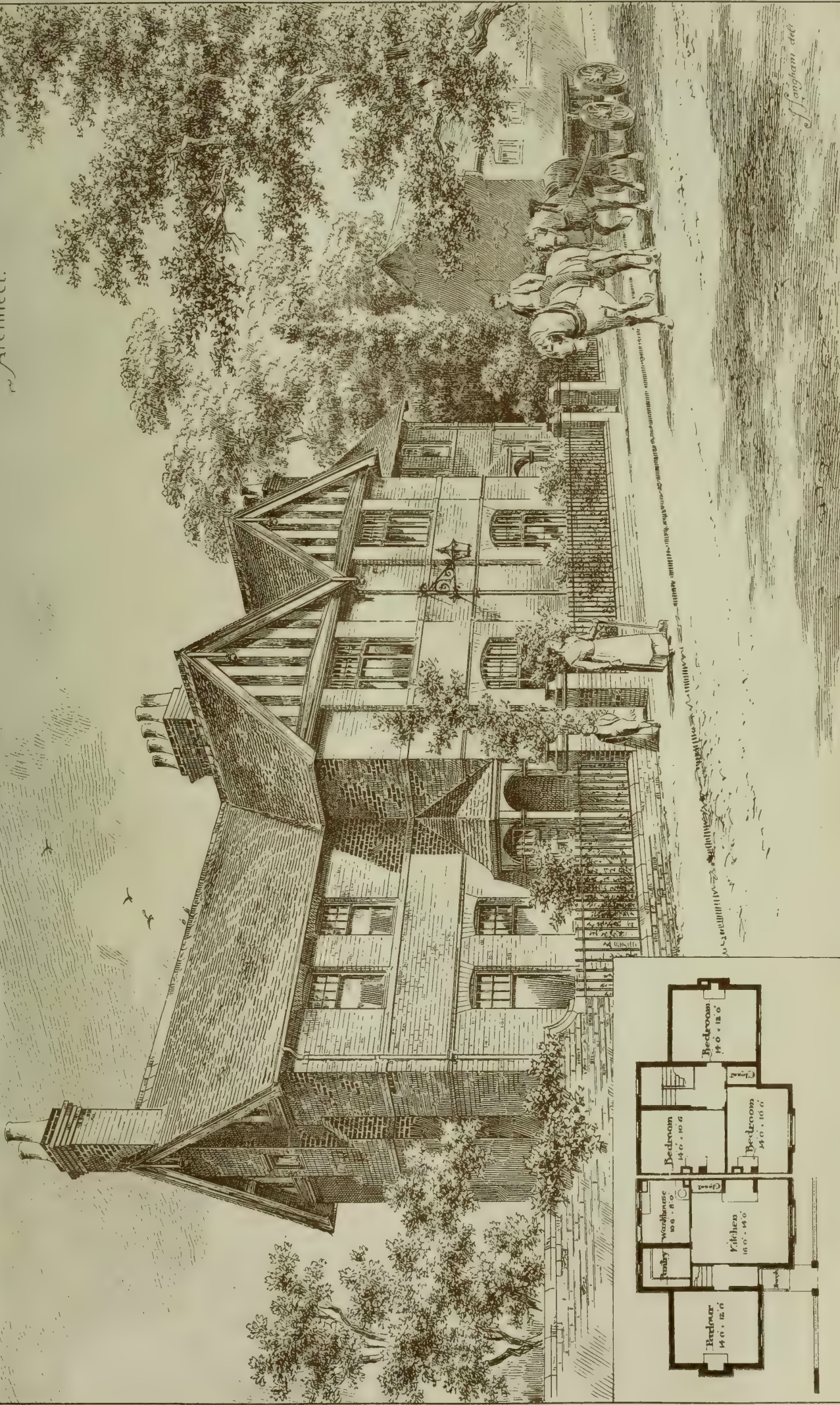




ILLINOIS



# COTTAGES AT GREENBANK JARLINGTON for SIR DAVID DALE BART C.F. Oliver F.S.I. Architect.



*J. Langham del.*







## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLII., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—H. W. F.—G. J. P.—B. G. and Son.—T. H. B.—O. S. Co.

## "BUILDING NEWS" DESIGNING CLUB.

## EIGHTH LIST OF SUBJECTS.

II.—A Tea and Coffee Restaurant for a suburban street. The site has a frontage of 25ft. and a depth of 60ft. The adjoining houses are 2ft. to top of parapet, but this need not exactly limit the height of our intended building. On the ground floor a bar and refreshment-room are to be contrived all in one apartment, as large as possible, after providing a private-way passage 4ft. wide from the street and a staircase up to the manager's rooms above, and after allowing for a rear yard not less than 10ft. wide the narrow way, and large enough for light and ventilation to the basement, where the kitchen, scullery, and larders, &c., are to be located. A lift to run up from kitchen through the shop at rear of bar to the first floor. A men's refreshment-room is to be provided, where smoking is allowed, on the first-floor back; a ladies' room, reached by the same staircase out of the shop, is to be placed on the first-floor front. A ladies' w.c. will be required in a convenient and well-screened position. On the second floor the manager's residence with one parlour, one bedroom, a bath-room, and w.c. to be arranged. In the attic floor above, three bedrooms for female servants are included, with a w.c. for their use. The depth of the house above the ground floor may be 30ft. from the street frontage. The shop floor to be 14ft. high, first floor 12ft., second floor 10ft. from floor to ceiling. The elevation is to be treated architecturally, with an allowance of 6ft. total space for width of piers to the ground story. The side door to be 3ft. wide in the clear, so that the shop-front opening will be 19ft. Plate-glass to be used—at any rate in the lower panels of the shop sashes. The shop doorway to be wide, and placed where most convenient. Material: Hoptonwood stone below, with brick above the first-floor level. Style optional. All cornices to stop 6in. short of the limits of the façade, and return in themselves against the wall. A wrought-iron sign may project above shop-front from the house not more than 5ft.

DRAWINGS RECEIVED.—"Pantile," "Nut," "Tyke," "Pickles," "Mannikin," "Nap," "Ulan," "Look," "The Manxman," "Charley's Aunt," "Agon," "Mist," "Geisha," "St. Leonard," "Nil Desperando," "Bolebrook."

## Correspondence.

## R.I.B.A. ELECTIONS.

To the Editor of the BUILDING NEWS.

SIR,—May I direct attention to another aspect of these elections?

There are allied to the Institute no less than

sixteen architectural societies, but only nine of these at a time are allowed representatives upon the council, and this is by an election under the provisions of by-law 30. Last year there was no contest; on previous occasions three or four representative candidates were defeated. If, therefore, four elected-president representatives did not attend even one of the twenty-eight meetings held during their year of office, there is good reason why they should retire in favour of the representatives of other societies. But, what those who are acting with me demand is, that there shall be periodical retirements from each class of the council, and that, after his third year of office, each member shall withdraw unless elected as a vice-president.

We are, therefore, voting for the seven new candidates only, leaving the present members of the council and the friends of the old system to say which eleven or more candidates of the existing eighteen members should remain in office.—I am, &c., A PLUMPER FOR NEW MEN.

London, May 15.

## Intercommunication.

## QUESTIONS.

[11632].—**Surveyor's License.**—Tarbuck on "House Property" says:—"By the 33 and 34 Vict. c. 97, appraisements made for the information of one person only and not obligatory between parties (no license being then required), and," &c. A revenue officer contradicts this, and says I must have license if I value dilapidations for the information of owner, or a solicitor, though not as a binding judgment. Which authority is correct?—YOUNG SURVEYOR.

[11633].—**Surveyors in Ordnance Department.**—Would some reader kindly oblige by giving particulars as to getting a position as a surveyor in the Ordnance Department, or where can I find particulars?—PUPIL.

[11634].—**School Floor.**—Will anyone give the specification of a first-rate school floor, which will be reasonably free from sound in schoolroom, and in the room beneath?—L. S. W.

The London Geological Field Class visited Snodland and Aylesford on Saturday afternoon for the purpose of examining the gault formations in those localities.

The Corporation of Ipswich have increased the salary of Mr. Roberts, their waterworks manager, from £225 to £300. He was appointed in the summer of 1892 at a salary of £150 a year.

The Manchester, Sheffield, and Lincolnshire Railway Bill has passed the Unopposed Bills Committee. It provides for constructing new railways in Northamptonshire and other districts, an extension of time for completing railways in connection with the Cheshire Lines, empowers the formation of a junction with the London and North-Western Railway at Connah's Quay, authorises the widening of the line between Gorton and Hyde, and the raising of £850,000 additional capital by shares and £116,000 by loan, and changes the name of the Company to the Great Central Railway Company.

The death took place at his residence, the Hough, Stafford, on Saturday, of Mr. S. Ginders, the senior member of the firm of Ginders and Turnor, estate agents and surveyors. Mr. Ginders, who had been in failing health, completed his 84th year last November. He had taken no active part in business for some time. When his father, who was agent for the Earl of Shrewsbury's estates in Staffordshire and Cheshire, retired from that position early in the forties, he was succeeded by his son, who held that position upwards of 30 years. After his resignation in 1874 he followed his profession at Stafford, and subsequently took into partnership Mr. E. W. Turnor. He was made a borough magistrate in 1879. As a man of wide, practical, and technical experience in the days of the great railway extensions his services were much in request as a valuer and a referee in arbitration cases.

The monthly report of the Labour Department states that the condition of employment, as a whole, remained practically unchanged during April, being still materially better than at the corresponding period of any year since 1890. In the 114 trade unions making returns, with an aggregate membership of 455,151, 11,378 (or 2.5 per cent.) are reported as unemployed at the end of April, about the same proportion as a month ago, compared with 3.2 per cent. in April, 1896. Employment in the building trades shows the usual seasonal improvement, and these trades are now very busy. The percentage of unemployed in unions making returns for April was 1.0, compared with 1.2 for March and 1.5 per cent. in April of last year. The furnishing trades remain busy. The percentage of unemployed union members at the end of April was only 0.5, compared with 0.7 in March and 0.9 at the end of April, 1896.

## WATER SUPPLY AND SANITARY MATTERS.

MILNROW, NEAR ROCHDALE.—On Wednesday week, the chairman of the Milnrow Urban District Council cut the first sod on the site of the new filtration works. The land, which is near to Uncouth Bridge, is about eight acres in extent. The sewerage of the district was begun in 1888, when Mr. Vawser was the engineer. Under his scheme 2,337 yds. of sewers were laid; and under his successor, Mr. James Diggle, C.E., 7,845 yds. have been put in. Mr. Vawser's plan of purification cost £4,450, and under Mr. Diggle's an additional £2,900 has been spent, making a total for purification works of £7,350. Main sewerage under Mr. Vawser cost £6,249, and under Mr. Diggle £10,950 has been expended, bringing the total up to £17,199. The entire cost under Mr. Vawser's scheme was therefore £10,699, and under Mr. Diggle's £13,850. In addition to these items there are legal charges, expenses of engineer and clerk of works, and the cost of house connections, bringing the gross amount up to £27,000. The contractor was Mr. Thomas Taylor, of Rochdale, and he is also doing the work in connection with the new filter bed. Mr. Bell is the clerk of the works.

## CHIPS.

Mr. C. T. D. Crews laid on Thursday in last week the corner-stone of the tower and spire of St. Augustine's Church, Kilburn, of which he is churchwarden. The work forms the completion of Mr. J. L. Pearson's design.

On Thursday evening in last week, the Marquis of Londonderry opened the Michael Faraday School situated in Faraday-street, Walworth. The school replaces a temporary one in Horsley-street, Walworth, and has been built, at a cost of £15,000, to accommodate 940 children.

At a meeting of the East Sussex County Council held at the County-hall, Lewes, on Tuesday, a portrait of Lord Monk Bretton, by Mr. F. W. W. Topham, was offered to the council on behalf of the subscribers for the picture, and accepted by the council. It is placed in the council chamber. Other portraits in the hall include those of the late Earl of Chichester and the late Viscount Hampden.

Major Marindin, of the Board of Trade, accompanied by Mr. Deuchars, superintendent of the North British Railway, and Mr. Bell, chief engineer, along with the engineers of the works, re-inspected the new line between Clydebank and Dalmuir junctions, and the new station at Clydebank Central, on Friday, and the major authorised their opening for passenger traffic.

On Saturday the foundation-stone of the new church for Weston-by-Runcorn was laid by the Dean of Chester. The edifice will provide accommodation for 250 persons, and will be built of Runcorn stone. A stone pulpit is in contemplation, which will be the contribution of the choir-boys, past and present. The contract for the building has been let for £3,137. This is exclusive of fittings, pews, boundary walls, &c. Towards the cost about £1,000 has yet to be raised. The choir-boys have taken an active part in obtaining funds, and in answer to their appeals 2,000 choristers from all parts of the country have sent small subscriptions.

At the last sitting of the Glasgow Dean of Guild Court, permission was granted to erect a Free church, halls, &c., in South Portland-street, Glasgow. The buildings will cover an area of 371,484c.ft.

The Kilmarnock Town Council has accepted the promised gift of a building to be used as a library, reading-room, and museum, at a cost of £8,000. The building will be erected on the site of the present library and museum buildings at Elmbank.

During the excavations on the site of Blackfriars and Greyfriars monasteries in the grounds of Cardiff Castle, under the superintendence of Mr. C. B. Fowler, architect, of Cardiff, a large quantity of 15th century stained glass has been discovered. The glass is very brittle in consequence of its burial for such a number of years; but many of the patterns and tints are still discernible, and represent animals, birds, and foliage, among which are the leopard, eagle, and dove, the ivy, vine, fig, maple, and oak; also the fleur-de-lis. The churches of Glamorgan are devoid of any old glass.

The Perth Improvement Bill, which takes power to construct a new bridge over the Tay at Perth, to erect new gasworks, and to form recreation grounds, &c., came before Lord Morley on Friday. The Bill being unopposed, the preamble was proved, and the measure ordered to be reported to the House for third reading.

The Churchmen of East Dereham have decided to inaugurate a fund for placing a stained-glass memorial window above the tomb of the poet Cowper in the parish church of St. Nicholas, and for restoring St. Edmund's Chapel, in which the tomb is situated.



## Our Office Table.

A RETURN has been presented to the London County Council by the Works Committee of works completed and certified between March 31 and September 30, 1896. The works were fifteen in number. On six the actual cost has been below the final estimate, the aggregate saving amounting to £734. On the nine remaining works the excess of cost over the estimate has been altogether £8,260. In view of these facts, Lord Onslow has given notice that when the report of the special committee on the Works Department comes up for consideration on Tuesday next, he will move that no further works be entrusted to that department, and that the central works recently completed in Belvedere-road, Lambeth, together with the plant therein, be disposed of as soon as the works in hand have been completed. It is asserted that the return of works executed by the Works Department and completed during the six months between September 30, 1896, and March 31 last will disclose further large and serious losses. The total estimated value of the works is about £75,000, and it is alleged that this estimate has been exceeded by nearly £19,000.

At the last meeting of the School Board for London, a long discussion took place on a report of the General Purposes Committee with reference to proposals to rearrange or increase the staff in various departments. In one case it was proposed that the action of the committee in declining to make any recommendation with regard to creating the post of head assistant clerk in the Works Department, such post to be held by a first-class clerk at an increased maximum salary of £400 per annum, be confirmed. An amendment proposed by General Moberly, the chairman of the Works Committee, was, however, carried by 22 votes to 21:—"That there be created the post of head assistant clerk in the Works Department, such post to be held by a first-class clerk at an increased maximum salary of £400 per annum, to be reached by annual increments of £12 10s."

The town council of Cardiff have advanced another stage in the promulgation of a new code of building by-laws, a subject which has been under consideration by committees for the past eight years. The work was taken in hand in 1889, and in the following year a draft was submitted to the Local Government Board. Negotiations were then in progress until the end of 1892, when the draft by-laws were again forwarded to the Local Government Board, who provisionally approved of them. They next came before the town council in March, 1893, and in April they were referred to the committee for further consideration on certain points. Negotiations with the Local Government Board were resumed, and an endeavour was made to induce the Board to modify a number of the model clauses to suit local circumstances with but small success. The matter was again taken up in January, 1897, and in March the draft came from the department with further amendments and suggestions. They were then referred to a sub-committee, who decided that the most expeditious way to carry out the mandate of the council would be to commence *de novo*. This was done, and having followed the model by-laws as closely as possible, the sub-committee's report was on Thursday in last week adopted by the Public Works Committee. The principal deviations from the model code are three in number—viz., that every new street "likely to form part of an important line of communication" must, if the council shall demand it, be not less than 60ft. in width; that all other new streets shall be 40ft. wide; and that all continuations of existing streets of greater width than 40ft. shall be so laid out as to be of the same width as the streets of which they are the continuations.

PROFESSOR MAHAFFY'S third and last lecture on "The Greek Theatre According to Recent Discoveries," delivered on Saturday afternoon at the Royal Institution, was mainly devoted to an exposition, illustrated by pictures on the screen, and to a vindication of the views expressed by Dr. Dörpfeld as to the structure and arrangement of the Greek theatre before it was modified by the Romans. It had long been held, on the authority of a passage in Vitruvius, that, while the Roman stage was about 5ft. above the level of the audience—of the area which included what we now called the pit as well as the orchestra—the Greek stage was raised to a level of 10ft. or 12ft. That statement had caused infinite trouble

and sorrow to the critic and historian, and had occupied generations of commentators. But a Danish scholar had recently expressed doubts as to the authenticity of a statement which had hitherto been held to possess unquestionable authority, and these doubts seemed to be well founded. Dr. Dörpfeld had proved by actual observation that it was the top of the back scene, and not the stage itself, which was thus elevated, and it was this which had been misnamed the *loyeron*. Great credit was due to Dr. Dörpfeld for the scientific study which he had devoted to the question and to the way in which he had demonstrated the transition from the old Greek form to that of the Romans. The passage from Vitruvius, or whoever was the writer, had been a fruitful source of error. In the Roman development the whole theatre was covered, the stage lengthened, and the old entrance heightened. It was the universal habit of the Romans to adapt Greek things to their own taste and use, and it was not difficult to reconstruct what was purely Greek from the Roman enlargement and modification.

IN connection with the Master Builders' Association a lecture was delivered by Mr. F. E. Weatherly, barrister-at-law, on Thursday evening, at the Guildhall, Bristol, on "Building Contracts." Mr. A. Krauss, the president, was in the chair. Mr. Weatherly at the outset expressed indebtedness to Mr. Hudson's well-known book on "Building Contracts," and pointed out peculiarities which distinguished building contracts from ordinary contracts. The architect, he said, was valuer, judge, and master of the situation. Moreover, he was agent of only one party to the contract, and his decisions and valuations could not be attacked except for fraud. To counteract this enormous power of the architect, clauses were inserted in the building contracts limiting the power, and giving in cases of certain disputes the right to refer to arbitration. In Bristol and the West all things, no doubt, worked smoothly between the architect and builder; but the powers given to architects by the common forms of building contracts were precisely what might cause friction—even ruin to builders and disaster to employers in cases where an architect was young and inexperienced. Members of the architect's profession in Bristol worked most amicably and honourably with the builders, as they would all admit. The architect did not guarantee that his drawings were correct, that his plans were feasible, that his calculations were accurate. He could not bind his principal by verbal representations varying his contract. The builder had no remedy where an architect made an error in the favour of employers, but where it was in favour of the builder the employer had a remedy against the architect. The builder was absolutely at the mercy of the architect unless he could show fraud, which was very properly a terribly difficult charge to support. One point builders had to fight for was that the drawings and plans should be guaranteed by the architect or his employer. He understood that the National Master Builders' Association had drawn up arbitration clauses which they desired to have adopted, but these had not been accepted by the Royal Institute of British Architects. The clauses showed how long-suffering the builders had been, and he thought they might have made broader claims.

By the lamented death of Mr. Chas. Hall, the managing partner of the Rugby Portland Cement Co., the position of works manager became vacant, and the directors of the company unanimously selected Mr. Isaac Brooks for the post. Mr. Brooks had been actively engaged assisting Mr. Hall for upwards of 25 years, and the unqualified success of the firm is in no small measure due to his energy and enterprise. Recognising that the authorities without hesitation offered him the managership, and he has the well wishes of a very large circle of friends for his continued success and prosperity.

The convalescent home erected by the North-Eastern Counties Friendly Societies for the use of sick members at Grange-over-Sands, Morecambe Bay, was opened by Sir James Laing on Friday. The home has been erected at a cost of £4,000, stands in two acres of grounds, and commands views of the sea and the mountains of Yorkshire and Westmoreland. Mr. John Hutton, M.S.A., is the architect, and the building is faced with local limestone with red sandstone dressings, and is covered with blue Westmoreland slates.

## MEETINGS FOR THE ENSUING WEEK.

- SATURDAY (To-morrow).**—Edinburgh Architectural Association. Visit to The Burns and Midhope. Train from Waverley Station to Philipstown. 2 p.m.
- MONDAY.**—Society of Arts. "Design in Lettering." Cantor Lecture No. 4, by Lewis F. Day. 8 p.m.
- TUESDAY.**—Institution of Civil Engineers. Engineering Conference. Opening address by J. Wolfe Barry, C.B., President. 10.30 a.m. Land Law Reform Association. Conference on "Rural Housing." Westminster Palace Hotel.
- WEDNESDAY.**—Engineering Conference at Institution of Civil Engineers. 10.30 a.m. Society of Arts. "Silver and Prices," by Moreton F. Owen, S.A. 8 p.m. Carpenters' Hall Free Lectures. "Partitions, Roofs, and Temporary Structures," by Prof. T. Roger Smith, F.R.I.B.A. 8 p.m.
- THURSDAY.**—Engineering Conference at Institution of Civil Engineers. 10.30 a.m. Society of Architects. "The Forum of Rome," by Alfred Fisher, Associate. St. James's Hall, Piccadilly. 8 p.m.
- SATURDAY.**—Lewisham Antiquarian Society and St. Paul's Ecclesiastical Society. Joint Afternoon Meeting at Pulborough and Hardham, Sussex, under the guidance of Mr. R. Garraway Rice, F.S.A., Barrister-at-Law. London Bridge Railway Station (L.B. and S.C.R.), Portsmouth line. 1.35 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE SEVENTH ORDINARY MEETING of the Society of Architects for the Session 1896-97, will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on THURSDAY, May 27th, 1897, at Eight p.m., when a Paper will be read by Mr. ALFRED FISHER, Associate, entitled "THE FORUM OF ROME," and illustrated by numerous limelight views.

ELLIS MARSLAND, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.

### CHIPS.

The marine biological station in the Firth of Clyde was opened on Saturday by Dr. John Murray in presence of a large number of ladies and gentlemen interested in the branch of science which the station is meant to serve. The building has cost about £1,500, and it is admirably fitted up for its purpose.

St. Michael's School, Bristol, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The memorial stone of the new Paisley Infirmary was laid on Saturday by Mrs. Stewart Clark, of Kilnside. The building, which occupies a fine site at the south end of Paisley, will cost between £70,000 and £80,000, and nearly the whole of that sum has already been subscribed. It will contain 140 beds. Messrs. Oswald and Finlay are the contractors.

On the estate of Belfield, Musselburgh, purchased by Mr. Mitchell, builder, for feuing purposes, a stone cist has been exposed while workmen were excavating the sand and gravel. In the cist were found a well-preserved human skeleton and an urn, which were acquired for the Edinburgh University Anatomical Museum by Mr. Simpson, who states that they date back to the Bronze Age.

The Duke and Duchess of Westminster will open the new technical schools at Northwich in July. The schools are the gift of Sir Joseph Verdin, and have been built at a cost of £10,000. They provide for the study of every branch of art, and rooms will be fitted with machinery to enable practical instruction to be given in mechanical science, plumbing, cookery, and laundry work. A gymnasium is provided.

The new organ in St. Saviour's Cathedral Church, Southwark, was dedicated by the Bishop of Southwark on Wednesday afternoon. The instrument is by Messrs. Lewis and Co., of Ferndale-road, Brixton, and has cost £4,000. The case has been designed by Sir Arthur W. Blomfield, A.R.A., the artist for the restoration.

Mr. A. E. Green has been appointed chief building surveyor under the Sheffield city council.

The foundation-stones of a new infant department of the Sunday schools belonging to the Wesleyan Memorial Church, Albion-road, North Shields, were laid on Monday. The extension will accommodate 175 children. Mr. F. R. N. Haswell, of North Shields, is the architect, and the tender of Mr. Thomas Robson, of Tynemouth, has been accepted.

The contract for the construction of the railway extension by the Barry Company into the Rhymney Valley has been let to Messrs. Price and Wills at an estimated cost of £300,000.



## LIST OF COMPETITIONS OPEN.

Hipperholme—Urban District Council Offices (£2,000 limit) .....	£10	J. E. and E. H. Hill, Clerks U.D.C., 4, Harrison-road, Halifax .....	June 7
Morecambe—Hotel Metropole .....	£100 (merged), £50, £25, and £15	Baxter and Abbott, Back-crescent, Morecambe .....	16
Elne, France—Water Supply Scheme (3,300 inhabitants) .....		La Marie, Elne, Pyrenées Orientales .....	July 1
Howth—Presbyterian Church .....	£20 (merged) and £10.	Rev. James Wilson, 4, Rhoda Villas, Howth, Co. Dublin .....	20
Bootle—Technical School, Balliol-road (£15,000 limit) .....	50gs., 30gs., 20gs.	J. A. Crowther, Borough Engineer, Bootle .....	31
Carlton, Victoria—Children's Hospital .....	£100, £50, £25	J. Nicholson, Hon. Sec. Pelham-street, Carlton, Australia .....	(1898) Jan. 30
Chesterfield—Brewery-street Board School (360 places) .....	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield .....	—
Bexhill-on-Sea—Drinking-fountain & Dog-trough (£200 limit) .....	No premium offered	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill .....	—
Burnley—Fountain, Queen's Park (£500 limit) .....	£10, £5.	G. H. Pickles, Borough Surveyor, Burnley .....	—
Bury, Lancs—Art Gallery and Free Library .....		The Town Clerk, Bury, Lancs .....	—
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit) .....	£25, £10	Borough Surveyor, Salter Gate, Chesterfield .....	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Alnwick—House, Swansfield Park-road .....	W. R. Hindmarsh	W. Robson Hindmarsh, jun., Architect, Alnwick .....	May 22
Corleston—Alterations to Stradbroke-road Girls' School .....	Great Yarmouth School Board	Bottle and Olley, Architects, Queen-street, Great Yarmouth .....	22
Heysham—Two Houses, Sefton-road .....	E. Edmondson	J. Marshall, Architect, Back-crescent, Morecambe .....	22
Halton—Four Houses .....		P. Robinson, Architect, 72, Albion-street, Leeds .....	22
Burnley—Health Depot .....	Corporation	Borough Surveyor, Burnley .....	22
Burton-on-Trent—Altering Premises, Hunter-street .....	Co-operative Society	G. H. Smith, Secretary, Burton-on-Trent .....	22
Bradford—Seven Houses, Undercliffe .....	Jubilee Committee	G. C. Gamble, Architect, Parkinson's Chambers, Bradford .....	22
Bradford-on-Avon—Swimming Bath .....	J. Young	The Town Surveyor, Bradford, Wilts .....	22
Bishop Auckland—House at Cockton Hill .....	T. Mason and Son	F. H. Livesay, Architect, Bishop Auckland .....	22
Ashton-under-Lyne—30 Houses in Ryecroft .....	L. N. Woodiniss	T. D. Lindley, Architect, 150A, Stamford-st., Ashton-under-Lyne .....	22
Eaglesfield—Public Library .....		Joseph Urquhart, Secretary, Eaglesfield, N.B. .....	22
Duffield—Club and Institute .....		J. B. Mason, Architect, Duffield .....	22
Devizes—Farmhouse at Caen Hill .....		J. P. Consterdine, 33, New Park-street, Devizes .....	22
Gledhow—Semi-Detached Villas .....		W. C. Hall, F.R.I.B.A., Park-row, Leeds .....	22
Westa Old Town, N.B.—Additions, House and Farm Buildings .....	P. Gordon	E. A. Wood, Estate Office, Gordonstown .....	22
Exmouth—Six Houses, Alston-road .....	Geo. Ellett	P. Sherwin, Architect, Exmouth .....	22
Exeter—Emmanuel Church .....	Church Extension Committee	Williams and Gould, Hon. Secs., Church House, Exeter .....	22
Keighley—Club Premises, Devonshire and Scott-streets .....	Liberal Club	John Judson and Moore, York Buildings, Cavendish-street .....	22
Sandbach—Alterations to Commons House, Sandbach .....	Urban District Council	A. E. Stringer, Clerk, Wheelock-road, Sandbach .....	22
Sedburgh—Alterations to National School .....		John F. Curwen, F.R.I.B.A., 51, Highgate, Kendal .....	22
Ryton-on-Tyne—Collier Shops and Eight Houses, Clara Vale .....	Stella Coal Co.	F. R. Simpson, Hedgfield Offices, Blaydon-on-Tyne .....	22
Stroud, Glos.—Schools at Uplands .....	Brewstons School Board	W. H. C. Fisher, Architect, 6, Rowcroft, Stroud .....	22
Sowerby Bridge—Rebuilding Tannery, Gratrix-lane .....		S. Wilkinson, Architect, Sowerby Bridge .....	24
Londonderry—Premises at James-street .....		T. Johnston, Architect, 11, East-wall, Derry .....	24
Portsmouth, St. Keverne—School .....		T. J. Joyce, Clerk, St. Keverne .....	24
Colchester—Pavilion and Lodge, Old Heath-road .....	Parks Committee	H. Goodyear, Borough Engineer, Colchester .....	24
Kinloss—Cottage at Doune Park .....	Commissioners for Control	John Forrest, Architect and Surveyor, 129, High-street, Forres .....	24
Monaghan—Chapel at Lunatic Asylum .....	Parish Council	Secretary, Board of Control, Custom House, Dublin .....	24
Rayley—Repairing Parish Properties .....	Commissioners of Control	E. Wright, Architect, Southend-on-Sea .....	24
Monaghan—Asylum Chapel .....		Sir T. Deane, Architect, 3, Upper Merion-street, Dublin .....	24
Bridgend—Conservative Club .....	Corporation	R. C. Griffiths, Solicitor, Bridgend .....	24
Bridgewater—Repairs, &c., to Properties .....	Colliery Co.	W. T. Baker, Town Clerk, Bridgewater .....	24
Elcheater—16 Houses .....	Corporation	Secretary, Hamsterby Colliery, Elcheater .....	24
Brighouse—Engine and Boiler House, Chimney Shaft, &c. .....	Co-operative Society	The Town Clerk, Brighouse, Yorks .....	25
Bishop Auckland—60 Houses .....	Trustees	Wm. Perkins, M.S.A., Victoria-street, Bishop Auckland .....	25
Bishopthorpe—New Church .....	Great Northern (Ireland) Railway	C. Hodgson Fowler, M.S.A., the College, Durham .....	25
Barford St. Martin, Wilts—Primitive Methodist School .....	Committee	Rev. R. Evans, 4, Grosvenor-terrace, Salisbury .....	25
Belfast—Goods Warehouse (348ft. by 66ft.) .....		T. Morrison, Secretary, Amiens-street, Dublin .....	25
Aberdare—Additions, National Schools .....		Rev. O. A. H. Green, M.A., Vicarage, Aberdare .....	25
Mold—Alterations, Treaddyn Wesleyan Chapel .....	Board of Works	Rev. T. O. Jones, Bedawen, Mold .....	25
Poplar—Alterations, Offices, High-street .....	Great Western Railway Company	W. H. Farnfield, 117, High-street, Poplar .....	25
Henwick—Station Buildings .....	Powell Duffryn Coal Co.	G. K. Mills, Secretary, Paddington Station, London .....	25
New Tredegar—40 Houses, Fothergills-road .....	J. Harrison	N. Phillips, Manager, New Tredegar .....	25
Stockton-on-Tees—Shops .....	Great Western Railway Co.	J. Sanderson, Architect, 134, High-street, Stockton .....	25
Henwick—Station .....	Urban District Council	G. K. Mills, Secretary, Paddington Station, W. .....	25
Honley—Outbuildings, Scotgate-row .....	Town Council	J. Barry, Surveyor, 9, Queen-street, Huddersfield .....	25
Hull—Houses and Stables, Flinton-street .....	R. Murray	Freeman Son, and Gaskell, Architects, Carr-lane, Hull .....	25
Dartmouth—Repairs to Market .....	School Board	T. O. Veale, Borough Surveyor, Dartmouth .....	25
Consett—Business Premises, Blackall Mill .....	St. Helen's Corporation	W. S. Shell, Architect, Taylor-street, Consett .....	26
Chester-le-Street—Shop and House, Beamish .....	Llandyfodwg School Board	Jas. Smith, 2, May-street, West Stanley .....	26
Hull—Additions, West Dock-avenue School .....	H.M. Commissioners of Works	D. J. O'Donoghue, Clerk, Town Hall, Hull .....	26
Kirkby—Two Cottages at Pumping Station .....	North Dublin Union	J. J. Lachland, C.E., Town Hall, St. Helen's .....	26
Gilfachgoch—Schools at Evans Town .....		J. Rees, Architect, Pentre Rhondda .....	26
Gateshead—Post Office .....	H.M. Commissioners of Works	Hon. Reginald B. Brett, Secretary, 12, Whitehall-pl., London, S.W. .....	26
Puckstown—Eight Labourers' Cottages .....	School Board	John O'Neill, Clerk, North Brunswick-street, Dublin .....	26
Waterfoot—13 Shops and Houses, 36 Lock-up Shops .....	Corporation	S. J. Wilkins, Architect, St. James's Chambers, Waterfoot .....	26
Leeds—Additions, St. Matthew's Schools .....	Glennmoray Distillery Co.	Smith and Tweedale, Architects, 12, South Parade, Leeds .....	26
Gateshead—Post Office .....		Office of Works, 12, Whitehall-place, S.W. .....	26
Ellenborough—Additions to School .....		C. Eaglesfield, Architect, Maryport .....	26
Edinburgh—Fever Hospital, Colinton Mains .....		Public Works Offices, Edinburgh .....	26
Elgin—House .....		C. C. Doig, Architect, Elgin .....	27
Edeyrn—Calvanistic Methodist Chapel and School .....		G. H. Roberts, Glanrhyd, Edeyrn, Carnarvon .....	27
Crumpsall—Vagrant Wards at Workhouse .....		Telford, Gunson, and Son, 10, Marsden-street, Manchester .....	27
Pentre Boughton—Welsh Baptist Chapel .....		Davies and Moss, Architect, 11, Regent-street, Wrexham .....	27
Pontardawe—Business Premises .....		W. W. Williams, Architect, 63, Wind-street, Swansea .....	27
Newhaven—Extension of Premises, Chapel-street .....		E. J. Hughes, Architect, Riverside, Newhaven .....	27
Salford—Repairing Spires, Cemetery Chapels .....		Borough Engineer, Town Hall, Salford .....	27
Souham—Enlarging Congregational Sunday Schools .....		E. Pearson, Secretary, Souham .....	28
Celbridge—Additions to Workhouse .....		S. Marring, Clerk, Celbridge, Ireland .....	28
Elland—Four Huts, Gordon-street .....		R. and R. E. Horsfall, Architects, George-street, Halifax .....	28
Cashel—National School .....		Rev. Geo. Nelson, P.P., Greencastle, Co. Tyrone .....	29
Elland Edge—Stabling, &c., Royal Oak Inn .....		F. L. Horsfall and Son, Architects, Lord-street Chambers, Halifax .....	29
Thornaby-on-Tees—Tower and Spire, St. Paul's Church .....		T. H. and F. Henley, Architects, 42, Tyrell-street, Bradford .....	29
Hastings—Priory-road School, West Hill .....		J. H. Tendall, Clerk, 4, Bank Buildings, Hastings .....	31
Levenshulme—Council Office, Stables, &c. .....		J. Ogden Hardicker, Clerk, 141, Stockport-road, Levenshulme .....	31
Hornsey—108 Workmen's Dwellings, Nightingale-lane .....		F. D. Askey, Clerk, Southwood-lane, Highgate .....	31
St. Leonard's-on-Sea—Infants' School, Bopeep .....		Elworthy and Son, Architects, London-road, St. Leonard's .....	31
Hanley—New Shopfronts, Market-terrace Buildings .....		J. Lobley, Borough Engineer, Hanley .....	31
Hastings—Additions, Priory-road School .....		J. H. Tendall, Clerk, 4, Bank Buildings, Hastings .....	31
Crook—Enlargement, Boys' School, Croft-street .....		R. Dixon, Clerk to School Board, Crook .....	31
Sandhurst—R.E. Workshops, &c., at Royal Military College .....		Lt.-Col. M. H. G. Goldie, R.E., North Aldershot .....	31
Drogheda—Six Houses, Francis-street .....		P. Connolly, Town Clerk, Drogheda .....	June 1
Breckhampton—Rebuilding Church .....		Austin and Paley, Architects, Lancaster .....	1
Haverton Hill—Engine Shed, &c. .....		Wm. Bell, Architect, York .....	2
Knutsford—Additions, Workhouse Hospital .....		Geo. Leigh, Clerk, Union Offices, Knutsford .....	2
Londonderry—Premises, Ferryquay-gate .....		T. Johnston, Architect, 11, Eastwall, Derry .....	3
Canterbury—Soldiers' Institute, Northgate-street .....		Major Fox, 13th Hussars, Cavalry Depot, Canterbury .....	3
Llangolton—Additions, Board Schools .....		Davies and Moss, Architects, 11, Regent-street, Wrexham .....	4
Bridport—Fever Hospital, North Allington .....		C. G. Nantes, Town Clerk, Bridport .....	5
Morecambe—Brick Chimney 129ft. in height, Engine and .....			
Boiler Houses .....			
Balham—Branch Free Library, Ramsden-road .....		John Bond, Surveyor, Council Offices, Morecambe .....	7
Gloucester—Additions to Technical Schools, Brunswick-street .....		T. Everatt, Clerk, Tate Library, Streatham .....	8
Ireleth—School Additions .....		The Town Clerk, Guildhall, Gloucester .....	8
Clayton-le-Moors, Clubhouse .....		Rev. J. A. Roberts, Ireleth Vicarage, Askam-in-Furness .....	15
Balvicar, N.B.—Ten Houses .....		W. Hopwood, Lower Barnes-street, Clayton-le-Moors .....	—
Aberystwith—Shiloh Chapel School .....		Slate Works Office, Balvicar .....	—
Buckhurst Hill—Two Villas .....		Hippkiss and Basset, Architects, Terrace-road, Aberystwith .....	—
Kirton—Malting, Warehouse, and Six Cottages .....		J. Batting, 7, John-street, Adelphi, W.C. .....	—
		Eyre and Southall, Architects, Gainsborough .....	—



## BUILDINGS—continued.

Pontefract—Seven Villas	Tennant and Bagley, Architects, Pontefract	—
Newcastle-on-Tyne—Pulling Down 50 & 52, Northumberland-st.	Wm. Newcombe, Architect, Pilgrim-street, Newcastle	—
Pontypool—House and Shop, Crane-street	N. M. Brown, A.R.I.B.A., Somerton-road, Newport, Mon.	—
Carlisle—Stores Extensions	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	—
Chilwell, Notts—Four Shops	E. R. Ridgway, M.S.A., Long Eaton	—
Walsall—Leather Factory	Fred. W. Cross, Architect, 2, the Bridge, Walsall	—
South Meigham—All Saints' Church	Henry Hall, F.R.I.B.A., 13, Doughty-street, W.C.	—
Ballineurra—Additions to Stores	John H. Bennett, The Maltings, Ballineurra	—
Walsley—Primitive Methodist School	W. J. Taylor, Architect, 35, Bank-row, Sheffield	—
Smethcote, Salop—Additions, National Schools	A. B. and W. B. Deakin, Architects, Fride Hill, Shrewsbury	—
Rochdale—Five Houses, Dover-street	Bamford and Brocklebank, Surveyors, 53A, Yorkshire-st., Rochdale	—
Nottingham—Technical Centre, Leen-side	A. H. Goodall, Architect, Market-street, Nottingham	—
Nelson—Seven Houses, Princess-street	R. Blakeborough, 51, Wilkinson-street, Nelson	—
Darlington—House, Russell-street East	Isaac Robinson, 3, Park-place, Darlington	—
Buckhurst Hill—Semi-Detached Villas, the Drive	Edmond Egan, Architect, Loughton	—
Burnley—Three Shops, Yorkshire-street	Chas. Parsons, Architect, 9, Grimshaw-street, Burnley	—
Hobson, Co. Durham—House and Shop	T. H. Stafford, South Garesfield, Lirtz Green	—
Barwick-in-Elmet—Additions to Churchyard, &c.	Rev. Canon Hope, Barwick-in-Elmet	—
Beeston—Pair of Villas	J. Huckerby, Surveyor, 8, the City, Beeston, Notts	—
Acharacle, Oban—Manse	Rev. Neil McKinnon, Acharacle, N.B.	—
Tregony, Cornwall—Church Restoration	Rev. J. F. Reeves, Tregony Rectory, Grampound	—
Sleetburn—Additions to Primitive Methodist Chapel	Plummer and Burrell, Architects, Durham	—
Sheffield—Workshop, Saville-street	Spear and Jackson, Etna Works, Sheffield	—
Heaton Park, Prestwich—Conservative Club	P. D. Lodge, M.S.A., 5, Cross-street, Manchester	—
Pelton Fell—Shops	E. Bowman, Architect, 52, Westgate-road, Newcastle	—
Penttyrch—Two Villas	J. Jenkins, Sunnybank House, Penttyrch, Wales	—
Nelson—Four Houses and Shop	Owner, 49, Fir-street, Nelson, Lancs.	—
Middleton—Branch Stores, Higher Wood-street	F. W. Dixon, Architect, Union-street, Oldham	—
Manningham, Bradford—Three Houses and Shop	Fairbank and Wall, Architects, Bradford	—
Leith—Improvements, St. John's Church	A. and R. McCalloch, Architects, 3, Bernard-street, Leith	—
Leeds—Factory, Cooleridge-street	J. Dickinson, Cross Fountain-street, Leeds	—
High Spen—13 Cottages	Secretary Conssett Iron Co., Blackhill, Co. Durham	—
Witton Gilbert—Institute	Secretary Conssett Iron Co., Blackhill, Co. Durham	—
Hawker—House and Stables	J. J. Milligan, Architect, 77, Baxtergate, Whitby	—
Dukinfield—Offices, Half-Moon-street	John Stafford, Town-lane Ropery, Dukinfield	—
Denaby Main—100 Large and 50 Small Cottages	Colliery Offices, Denaby Main, Rotherham	—
Derby—Alterations to Vulcan Ironworks	E. R. Ridgway, Architect, Long Eaton	—
Burnley—Rebuilding Church Institute	Thos. Bell, Architect, Burnley	—
Belfast—Business Premises, Berry-street	W. J. Moore, Architect, Whitehall Buildings, Belfast	—
Sacristan—South Aisle, &c., St. Peter's Church	Oliver and Leeson, Architects, Mosley-street, Newcastle-on-Tyne	—
Penarth—Chimney Stack at Cement Works	The Works, Penarth	—
Ockbrook—Reseating of Parish Church	Rev. L. Lewis, Ockbrook Vicarage, Derbyshire	—
Norden—Liberal Club	S. Butterworth and Duncan, 4, South Parade, Rochdale	—
Newbiggin-by-Sea—Stores	Davidson and Bendle, Archts., Grainger-st. W., Newcastle-on-Tyne	—
Knocknamuckley—Parochial Hall	Wm. J. M'Keown, architect, Banbridge	—
Leeds—Villa at Roundhay	C. Fowler, Surveyor, 24, Basinghall-street, Leeds	—
Kilkenny—Cottage	Edw. Dunphy, Mount Sion, Kilkenny	—
Birle, Lancs—Vicarage	C. H. Openshaw, Architect and Surveyor, Fleet-street, Bury	—
Bolsover—Alteration to Two Shops in Market-place	Alfred Taylor, Alma Villas, Bolsover	—
Beaup—Alterations, Thorn Inn and Butchers' Arms	Charles Parsons, Architect, 9, Grimshaw-street, Burnley	—
Woking—Goldsmith Schools	G. H. White, Clerk, Woking	—
Pontnewydd—Rebuilding Three Shops	J. Poulton, Pontnewydd	—
Trudoxhill, Nuneys—Mission Church	E. H. Lingen Barber, Architect, 143, St. Owen-street, Hereford	—
Leeds—Battery Station at Kirkstall	City Engineer, Town Hall, Leeds	—
Leeds—Alterations, Entrance, Roundhay Park	City Engineer, Town Hall, Leeds	—
Holbeck—Ten Houses	F. W. Rhodes, Architect, Upper Wortley, Leeds	—
Hereford—Eight Cottages, Ryeland-street	W. W. Robinson, Architect, 10, King-street, Hereford	—
Charminster—Four Pairs of Cottages	T. Coombs, Clerk, 5, South-street, Dorchester	—
Bury, Lancs—Mission Room, Clerk-street	Thos. Nuttall, Architect, 20, Market-street, Bury	—
Eastbourne—Extension Boiler House, &c.	Mitchell and Ford, Architects, 2, Langney-road, Eastbourne	—
Dukinfield—Additions, Wellington-street Schools	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	—
Dukinfield—Villa, Higher King-street	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	—
Cheshunt—Three Villas and Offices	James Bunce, Turner's Hill, Cheshunt	—

## ENGINEERING.

Belfast—Driving 1,000 Piles	Election Committee	Græme-Watt and Tulloch, Engineers, 77A, Victoria-street, Belfast	May 22
Hull—Brick Bridge, Melwood-grove	Corporation	A. E. White, Borough Engineer, Town Hall, Hull	" 22
Portrane, Co. Dublin—Heating and Ventilating New Lunatic Asylum	Board of Control	G. C. Ashlin, Architect, 7, Dawson-street, Dublin	" 24
Tooting-grove—Heating and Water Supplies, Grove Hospital	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk-street, Strand, W.C.	" 26
Carmarvon—Sea Wall	Harbour Board	W. Bowen Jones, Engineer, Carmarvon	" 27
Marnhull—Little King's Mill Bridge	Dorset County Council	W. J. Fletcher, County Surveyor, Wimborne	" 28
Donegal—Water Supply for Callinboy Lough	Board of Guardians	J. L. D. Meares, C.E., Town Hall, Newry	" 29
Wakefield—Precipitating Tanks, &c.	City Council	R. Porter, City Engineer, Town Hall, Wakefield	" 29
Wakefield—Sewage Pumping Engines, &c.	City Council	R. Porter, City Engineer, Town Hall, Wakefield	" 29
Walsall—Gasholder Tank (152ft. diam., 30ft. 6in. deep)	Corporation	John R. Cooper, Town Clerk, Bridge-street, Walsall	" 29
Laver Bregon—Enlargement Main Road Bridge	Essex County Council	P. J. Sheldon, Surveyor, Chelmsford	" 29
Ashby-de-la-Zouch—Waterworks	Urban District Council	W. A. Musson, Clerk, Ashby-de-la-Zouch	June 1
Wakefield—Electric Lighting Plant	Board of Guardians	H. Beaumont, Clerk, Union Offices, Wakefield	" 2
Brussels—Local Light Railways, Les Engghien to Soignies	Bulgarian Government	Secretary of Local Railways, 15, Rue de la Science, Brussels	" 6
Bulgaria—Railway from Rustchuk to Tirnovo		Ministry of Public Works, Sofia	" 7
Keswick—Strengthening Middle Beck		D. N. Pope, Land Agent, Keswick	—

## FENCING AND WALLS.

Hoxton—Railing in Charles-square	Shoreditch Vestry	J. R. Dixon, Surveyor, Town Hall, Old-street, E.C.	May 22
Croydon—W.I. Fencing, Epsom-road (240 yards)	Corporation	E. Mawdesley, Town Clerk, Town Hall, Croydon	" 25
Dewsbury—Boundary Wall at Westtown		Holton and Fox, Architects, Westgate, Dewsbury	—
Denholme—Boundary Walls to Wesleyan Schools		Judson and Moore, Architects, Keighley	—

## FURNITURE AND FITTINGS.

Selly Oak—New Workhouse Infirmary	King's Norton Board of Guardians	E. Docker, Clerk, Selly Oak Workhouse	May 24
Thorpe, Norwich—Furnishing Laundry Block, Norfolk Lunatic Asylum	Norfolk County Council	The Clerk, Thorpe Asylum	June 2
Folkstone—New Board Schools, Sidney-street	School Board	A. H. Gardner, Clerk, 8, Cheriton-place, Folkstone	" 9

## PAINTING.

Macclesfield—Cemetery Buildings	Corporation	W. F. Taylor, Town Clerk, Macclesfield	May 22
Hyde Park Barracks	War Department	R. E. Office, 41, Charing Cross, W.C.	" 24
Kensington Park Barracks	War Department	R. E. Office, 41, Charing Cross, W.C.	" 24
Carlisle—Various Properties	Rev. T. M. Remington	Daniell and Binyon, Solicitors, Ulverston	" 28
South Aldershot—Periodical Painting, Wellington and Stanhope Lines	War Department	Lt.-Col. Pitt, R.E., South Aldershot	" 29
St. Alban's—Sisters Hospital, Clarence Park Buildings, and Corn Exchange	City Corporation	A. H. Debenham, Town Clerk, St. Alban's	" 31
West Ham—Painting and Repairs, Five Schools	School Board	C. W. Carrell, Clerk, Broadway, Stratford	June 16

## ROADS AND STREETS.

Bishop Auckland—New Roads and Footpaths	Co-operative Society	Wm. Perkins, M.S.A., Victoria-street, Bishop Auckland	May 25
Brighton—Wood Paving in New-road and North-street	Corporation	F. J. Tillstone, Town Clerk, Brighton	" 28
Braila—Paving Streets and Squares	Corporation	Mairie, Braila, Roumania	" 31
Tottenham—Tar and Asphalt Paving throughout District	Urban District Council	Edward Crowne, Clerk, Tottenham	June 1
Dartford—Making-up and Paving Four Roads	Kent & Essex House Investment Co.	G. W. Cobham, Surveyor, 40, Windmill-street, Gravesend	" 2
Audenshaw, Lancs—Sewering, Paving, &c., Whitehead, Church, and West-streets, Hooley Hill	District Council	J. H. Burton, 2, Guide-lane Hooley Hill	—
Blaina, Mon.—New Road through Rectory Fields	Nantyglo Ironworks Co.	Adams and Vachell, Engineers, Newport, Mon.	—

## SANITARY.

Haslingden—Sludge Pressing Machinery	Outfall Sewage Board	R. W. Bagler, Clerk, West View, Haslingden	May 22
Huddersfield—Seven Water Tanks	Corporation	Town Clerk, Huddersfield	" 22
Heywood—Brick and Concrete Culvert, &c.	Corporation	J. A. Settle, Borough Engineer, Heywood	" 25
Brighouse—Sewage Tanks and Engines	Corporation	A. M. Fowler, M.I.C.E., 1, St. Peter's-square, Manchester	" 25



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### UNPURCHASABLE ART.

AS a matter of fact, when a man pays for the professional services of an architect he pays for professional skill and experience, and not for any artistic power or feeling he may have imported into his design. Every architect knows that he competes on equal terms with another in this respect, and that if he has given to his work a character of its own, that is not a thing he can charge for. People may think that when they employ an architect to design a building they get a certain amount of taste and art. No doubt they do sometimes; but any "hall mark" of genius may not be there. A dozen architects may send in designs for a building, but only one of them may endow his work with the real quality or character of art, and for this he gets nothing. It is even possible that if a renowned architect were asked to furnish a design for a building, it might, after all, lack the real article. Art in architecture is not a purchasable quality: it is not always so in painting or sculpture. The late George Gilbert Scott, F.S.A., has said art is always so to speak "by the way," in architecture. "It is given in, it cannot be bought, and is never paid for." Truer words were never spoken, although in these commercial days, when money is supposed to buy everything, there is an idea current that the best and highest art can be obtained for money;—the man may be, but not the real thing, and that is often all the main object in view in securing the best men. How often has it happened that a poem or a piece of music written for a special occasion—for a great national event—falls short of many a chance production of the same author! Anything done on commission, painting or architecture, is often divested of the real merit which belongs to occasional production. The architect knows this as much as the painter: he cannot be always creating or turning to a happy result a new situation in design. And then he is so restricted by requirements and by material. He has very few opportunities of impressing his individuality on the design, which the painter and the sculptor have both the means of doing, as they work on their own materials. If we consider what the architect is employed to do we shall see how limited his powers are to exercise his artistic inclinations; and it seems that the more elaborate the building, the greater the degree of its complexity, the less able he is to employ those imaginative faculties or to use his taste to the best advantage. The client wants a plan which must be as perfect as possible for his particular business or accommodation, and he looks to his architect to give him something he likes in the shape of an elevation. If the architect does this he is satisfied. The absolutely necessitous demands leave the designer very little opportunity for real thought or invention. If there was anything clever or artistic in the first sketch or design, it is doubtful whether it has survived the absolute demand of the owner, the contractor, or the quantity surveyor, each of whom has something to say. In a variety of ways it has been denuded of features, or, what is worse, brought down to the level of a commonplace building. Conspicuously this is the case with the majority of works carried out by professional men. The *élite* amongst them are more fortunate; their position and reputation make them independent of owners and contractors, and if there is any art to be

obtained, they are more likely to impress it upon their works. If we go to Mr. So-and-So, he is almost sure to give us something good and artistic; but even this is problematical—he might design something that is very commonplace indeed. Men with ideas are what are wanted, and these are as much to be found among the humbler ranks of the profession as among those who have reached a position. We can certainly not say that all our eminent architects give us art; they have a lot of work thrust upon them—churches, schools, public buildings, and houses, many of which show very little above the average, and some of them are showy and commonplace, and the details exceedingly poor. They may be all very correct and proper, but still very far from having the true art quality about them. Successful architecture, in fact, is not an exclusive possession of any class; the man overwhelmed with commissions for big buildings is more likely to become mannered and lose the keener sense for art than one who has more time on his hands. Some of our very best and most spirited work has been done by the younger men while winning their way in competition, and who have not been trammelled by school or office routine. Not a few of our unsuccessful buildings have been designed by men who were overworked, or who had commissions thrust upon them, and the consequence is that the design and detail were intrusted to others. Who has ever heard of art being thus delegated?

No doubt it would be rather difficult to define the unpurchasable qualities of art, as they are not the most positive or tangible. The ordinary English employer of architects regards the very word "artistic" with dismay as a sort of expensive faddism, want of common-sense, sacrifice of comfort, and what not. And no doubt in many cases he is right according to his interpretation of the word. To him it is something super-added, a luxury which he can do without, and that costs money, and what he knows of art has justified him in this objection. As Dr. Rowand Anderson said the other day in his address before the Edinburgh Architectural Association, "the architect was the interpreter of the public idea of art at any given time, and he had to provide what the public wanted and was prepared to pay for." It was perfectly true also, as Dr. Anderson said, "that the law could not protect the public from bad art, and if it got bad art it got what it wanted, and the only thing it was able to appreciate." The one hope was an educated public, when they came to look at art not as a question of ornament and as a thing apart from structural and functional truth—then the bad architect would disappear. No doubt he would; but the ordinary employer of architects is satisfied with proof of his adviser's proficiency in those more necessary requirements for substantial and sanitary building, which proficiency can only be tested by an examination, and therefore we think the late President's remarks on the registration of architects entirely fall through. As the public go to lawyers or doctors for what they are certified to possess and to be able to do, so in precisely the same manner the public will go to architects for their knowledge of the essentials of good building. The simple fact is that while all may be made competent to build safely and well, only a few are able to design artistically. It is not admitted that registration will insure competence in art. As a matter of fact, the architect's vocation is in no sense different from those of the professions named as regards fundamentals. A man who goes to a lawyer on a legal point is bound to accept his advice, just as a man who goes to an architect accepts the experience and skill for which he pays; but in neither case is the personal ability of either guaranteed. He pays for the knowledge possessed by each; natural ability on the part of the lawyer

or artistic genius on the part of the architect is a matter of chance. What are those qualities of architecture which make for the artistic? It is not a study of details or an addition of ornament. An authority on Gothic architecture has said with truth that sections of mouldings and patterns of traceries are not the most important studies; we do not take half enough account of the general scheme of design, of the distribution of plan, and of general proportions. He was speaking of church design; but the same criticism applies to other branches as well. Art can be shown in the humblest as well as in the most costly building; but it is just this truth that the average client is unable to understand. If he wants a moderate house built, he acts on the supposition that the architect is not the right person to employ, and is unable to realise the fact that it is just in this class of building that the true architect may give him all he wants, with "art thrown in," a better grouping of plan as well as excellence of detail.

In matters of decoration and furnishing, art is a more recognised "quantity," and we find people ready to pay for it in a certain sort of way. They are ready to go to the decorator and the "art furnisher," who supply them with the "latest fashion"—Jacobean, Queen Anne, Japanese, and any other style of decoration or furniture. They pay for machine-made goods and redundant decoration often without any real art, they buy the "modern tile stove" under various fictitious names, and elaborate overmantels in any wood, and at almost any price, to meet their taste. The so-called "art" is redundant and tangible, and is worth paying for; or perhaps it is a piece of old furniture, or an imitation chair, or table, or sideboard. Again, it is considered to be a mark of taste to buy some picture by a popular painter, or to have a portrait painted by a well-known artist, while, at the same time, the most ordinary articles of everyday life—carpets and wall-papers, chairs and tables, and tea and dinner services—may be of the most commonplace design. With such people the idea underlying art is that it is something that can be purchased like anything else—pictures or furniture—but does not apply to the surroundings of daily life. Extraneous "art" cults have in this way sapped the public taste, by raising a barrier between all structural and useful and merely decorative art. The architect's skill and labour is regarded as completely outside the domain of art, as something more to do with building materials and drains; and as architectural taste is not understood, it is not thought worth paying for. And has not the mode of paying an architect by commission on outlay strengthened the popular notion? So long as the architect's remuneration is a commission or the cost of labour and material, and on no other qualification, how is it possible to expect art from the rank and file of the profession? They are not paid for it, and therefore, if the owner gets it, it is "something given in"—he cannot buy it. When a man is better paid for a factory or a prison than for a church or villa on this principle, there is little inducement for him to exercise much more than mechanical skill. Art for art's sake, the expression of a man's pleasure in his work, is not an everyday achievement. Very rarely do we find a member of the profession rise to the occasion and look upon his work as something more than so much bricks and mortar and labour, and impart to the most commonplace detail—a brick feature or a moulding, or a bit of ironwork—the vigour of his intellect or the fervour of his own enthusiasm. Only when such an expression of skill or feeling can be purchased in the market or be quoted in the stock and share list can we hope for a public recognition of the worth of the architect's work.



## CONTRACT DISAGREEMENT.

THERE is one ground on which architects and contractors are not ever likely to agree, and that is on the question of building contracts. Nor, perhaps, would it be for the best interests of the public that they should be agreed on all points. The duty of the architect who acts for the owner is, of course, to see that the builder does his work in all things up to the standard of the specification and drawings; his interest must, therefore, be on the client's side, and, to a certain degree, prejudiced. On the other hand, the builder, however straightforward and honest, is more apt to strain a point that will favour an economical view of the actual building requirements. When two courses are open, one more laborious or costly than another, he will naturally choose the easier and less costly, and he will be more likely to interpret clauses in the conditions or specification that will be for his own interests. It would be unreasonable to expect him to act otherwise. In the larger number of instances low tendering has not improved matters, and there is a desire on the part of contractors of small capital and of not very scrupulous methods to override the contract or to find loopholes. For these reasons the modern building contract has become a rather portentous document, a source of dispute containing a great many clauses which give the architect exceptional powers for the protection of his client. These powers have given offence to a large number of well-meaning builders, and have rendered it extremely difficult to bring about an *entente cordiale* between the two parties to the contract. The builders have lately determined to act independently, and have therefore adopted a form of agreement of their own to be used with the conditions of contract agreed to between the Institute and the Builders' Society in 1870. These conditions or "heads" of contract have been revised and brought up to date. On the other hand, the new form of building agreement issued by the Institute of Architects some time ago on their own account has been adopted by a few only in the profession, and the provincial architect is really worse off than before as to possession of a well-considered and materially arranged form of conditions. As our readers are aware, the builders could not agree to some of the more important clauses, and so the negotiations fell through.

To produce a form of contract strictly fair between employer and builder, is, of course, not an easy matter, and the ordinary legal mind is unable to frame a set of conditions that will be accepted. One of the points that is naturally distasteful to the builder is that the architect should become—as Mr. F. E. Weatherly said at the Guildhall, Bristol, in connection with the Master Builders' Association—architect, valuer, and judge of the work. He not only prepares drawings and specifications for its performance, but in case of disagreement about them becomes a judge and referee, whose decision must be taken as final. According to the general clause in contracts, the intent and meaning of the drawings and specification must be taken together, even should it so happen that a particular thing is not shown in the one or described in the other. Or, if the contractor finds any discrepancy between these documents, he is to refer the same to the architect for his decision. The contractor regards this clause as unfair, for he says that it may be made to cover any omission or fault on the part of the architect. Then he objects to the clause which allows the architect to hold him rigidly to the drawings and specifications, while at the same time he has the sole right to order any variation he thinks proper. The contractor cannot claim for any extra, even if so ordered, unless it be in writing. The clause of the Institute schedule is certainly an improvement on

this. It allows the contractor to give notice to the architect of any excess he may find in any of the details or instructions given to him, and to appeal to an arbitrator in case the architect and he disagree as to the point. Again, the twofold function of architect and arbitrator comes in where the architect orders removal of materials or workmanship he considers improper. The builder has no redress if he thinks otherwise, but has to carry out the order at his own cost, or to bear the expense, if carried out, if he declines to do so. Of course, no architect of any competence or repute would make such an order without due examination or consideration, unless an over-officious or exacting clerk of works tried to make it unpleasant—a thing which very seldom occurs. And it will be seen that an architect ought to possess this power, or his function of architect as judge of material and labour cannot be exercised. At the same time we must admit there are cases where some leniency on the part of the architect has to be exercised. Suppose a sub-contractor nominated by the architect, say a mason, has supplied defective stone. To call upon the builder to make it good at his own expense after the completion of the work is one of the conditions of a contract, though in some cases it would be rather hard. It is possible also for an architect to misjudge a piece of work or the quality of timber, which, though perhaps not exactly as specified, may be for all practical purposes quite good enough for its particular position. The contractor in such a case (exceptional though it be) ought, no doubt, to have some voice in the matter in dispute. The builder naturally takes exception to the employment of a sub-contractor nominated by the architect or employer; and in justice to him, he ought to have some voice in his appointment, and to obtain at least an indemnity from him for any loss or injury he may be put to through his neglect. The clause in the published schedule meets this want. Every sub-contractor should be made amenable to the terms of the general contract, and in this way alone can any injustice be avoided.

Provisional sums which are provided by the architect for certain works or fittings or special artists, are a considerable grievance to some builders, who regard these provisions as infringements on their contract rights, though on what ground we cannot see. They are specified sums to be paid at certain times to tradesmen whom the architect may select, and are therefore part of the contract. The idea of some builders is that they should bear the same discount as the other goods; but this would be to destroy the very object of their provision. The clause in the schedule fairly meets the case. The object of this provision is to give the architect some personal control over certain parts of the building, its fittings and decoration, which ought to preserve a character, and is therefore a very desirable one. The builder, however, claims to be protected from loss, as, for instance, in extra work caused by preparation, or additional labour, or in making good after the special tradesman or artist has done his work, and for this purpose provision ought to be made.

The completion of a building by the date named is another of the points about which disputes take place. There are sometimes exceptional circumstances which have to be taken into account, such as a strike. In one instance the works may be delayed owing to bad weather, frost, or excessive rain; in another instance it may be owing to difficulty in obtaining a foundation, which necessitates engineering work; in a third case time may be wasted by a delay in the delivery of goods, stone or terracotta, or ironwork; in other cases some pending decision on a legal point may be the cause. Whatever it be, the architect is called upon to extend the

time. We do not consider here the case of a builder's neglect, which is more frequently the cause of delay, and against which a stringent clause is required. As a protection to building owners such a clause is absolutely necessary. The right to refer to arbitration is the safety-valve, the Magna Charta of the contractor's right. The arbitration clause limits the architect's power, but has been one upon which the builders have not been able to agree with the profession. We are told that in Bristol and the West architects and builders work smoothly together; that the usual forms of contract cause friction and even ruin to builders, and according to the opinion of many in the trade, the architect should guarantee the correctness of his drawings and specifications, or the employer ought to do so, but this was both impossible and undesirable; that the contractor had no remedy where an architect made an error in the favour of his employer; and that he was at the mercy of the architect unless he could prove fraud, which was not easy. These are opinions which we are constantly hearing from builders, and they show how impossible it is to come to a mutual understanding. But, as a matter of fact, a building contract that is to be of any use or binding obligation between the two parties must almost of necessity appear to be a stringent document, and any relaxation of the covenants must be left to the discretion of the general agent or the architect as the interpreter of his own intentions.

## THE ARCHITECTURAL ASSOCIATION.

THE closing meeting for the Jubilee Session of the Architectural Association was held on Friday evening, the President, Mr. Beresford Pite, F.R.I.B.A., in the chair. Messrs. S. Bridges, J. S. Collings, and G. L. Elkington were elected as members, and Mr. Arthur Cates, and Mr. S. E. Baker were reinstated as members by acclamation. Mr. E. Howley Sim proposed a vote of thanks to Mr. E. T. Hall for allowing members to visit the Park Hospital on the 1st inst. This having been agreed to, Mr. B. Flight Fletcher proposed a vote of thanks to the Entertainments Committee, to Mr. G. B. Carrivill, and to the ladies and gentlemen who contributed to make the recent *soirée* at St. George's Hall a success, and this was carried amid applause. The President announced that for the sixth year in succession the council of the Royal Institute of British Architects had granted the sum of £100 towards the educational work of the Association. He proposed a vote of thanks to the council, and also for the use of the meeting hall during the past two sessions. This was agreed to.

## ELECTION OF COMMITTEE AND OFFICERS.

The scrutineers presented the report as to the result of voting for committee and officers for the ensuing session:—President: Hampden W. Pratt, 292 votes. Vice-Presidents: A. H. Hart, 295; and Banister Flight Fletcher, 288. Committee: Beresford Pite, 237; G. H. Fellowes Prynne, 222; R. Shakleton Balfour, 219; Francis G. F. Hooper, 214; F. T. W. Goldsmith, 182; W. Howard Seth-Smith, 176; H. B. Cresswell, 163; C. de Gruchy, 159; T. W. Aldwinckle, jun., 144; and W. D. Carøe, 142. Hon. Treasurer: H. W. Pratt, 297. Hon. Librarian: C. H. Freeman, 297. Hon. Secretaries: G. B. Carrivill, 295; and E. Howley Sim, 294. Other officers (301 votes each): hon. solicitor, W. H. Jamieson; hon. assistant librarian, E. W. M. Wernacott; hon. auditors, Matt Garbutt and H. P. G. Maule; assistant secretary and registrar, D. G. Driver; 305 papers were received, of which four were rejected as informal.

A vote of thanks was accorded the scrutineers, Messrs. C. H. Brooke, M. Garbutt, G. W. Jones, and H. D. Wilkinson.

## THE A.A. TRAVELLING STUDENTSHIP.

The President announced that this prize had been awarded to Mr. E. H. Evans.

## PLUMBING AND SANITARY WORK.

A lecture on this subject, illustrated by diagrams, specimens, practical demonstrations, and lantern-views, was given by Mr. S. STEVENS



HELLYER (Messrs. Dent and Hellyer, Newcastle-street, Strand). At the outset the author corrected the prevalent idea that sanitary work tended to increase year by year in costliness. Indeed, apart from the increase in plumbers' wages, which applied to all the other building trades, the sanitary plumbers' work of to-day cost but little more relatively than did the insanitary work of two or three decades ago. The additional cost for better treatment and arrangement for better ventilation of the soil-pipes and waste-pipes was largely met by the adoption of more simple methods, by the use of cheaper traps, smaller waste-pipes and soil-pipes; also by the use of fewer cisterns, and cisterns of smaller size and of a less expensive character; and, further, by the difference in the market price of materials, lead especially being much cheaper now than it was a quarter of a century ago. No doubt the many improvements which had been made in the best kinds of valve-closets had increased their cost; but this was met by the simplification of certain parts, and by the use of plainer basins, a simple white satisfying for most places now; for we no longer required to study colours in our water-closets—we had our art schools for that—nor did we now seek for closet-basins with looking-glass bottoms. Having shown on the screen lantern-slides illustrating the insanitary method of treating a valve-closet about 40 or 50 years ago and the sanitary method now practised by those proficient in their work, Mr. Hellyer continued:—There are older methods of treating the valve-closet than the one just shown, that being considered (half a century ago) an improvement upon the treatment it first received in the latter part of the last century and the earlier part of this. For instance, in the illustration just shown the waste-pipe from the safe is trapped independently of the closet-trap, a weeping-pipe from the closet service is turned into it for charging the trap with water every time the closet is used; whereas in the earlier method the waste-pipe from the safe was connected with the closet trap, as, in fact, was also the waste-pipe from the cistern. In the earliest method of all, these two latter dangers were non-existent: the closets having no safes under them, no waste-pipes were required; and as the water was generally pumped up into the closet cisterns, where situated above the basements, there was no such need for cistern wastes, especially as the water, instead of overflowing the cistern, could run away through the wire-pipe of the service box into the closet basin, and through the overflow pipe of the latter into the closet-trap and out into the soil-pipe. In the old method, the Bramah closet was supplied by means of a spring-valve, a spoon or shoe-valve, or a round drop-valve soldered to a lead service-box; but such details do not in any way upset our conclusions as to the greater amount of labour involved in the old method than in the new. That carries us a long way, for it mattered not whether a valve-closet or a pan-closet were adopted; the plumber's work was just the same in both, the service-box only being a little larger in the former case than in the latter. For good houses the best plumbers used to consider the Bramah closet the proper kind for the principal water-closets, and the pan-closet for more common use and for servants' use indoors, and sometimes also for the upper servants' use in the yard or area, though the water-closet in the latter places was generally fitted with the well-known long hopper-closet. I will say nothing about the cost of the latter, excepting to remind you that it was cheap and advertising; but the insanitary pan-closet, with its D-trap and other belongings, cost more than the sanitary pedestal wash-down closets of to-day. In this reference to the relative cost of the modern method of plumber's work with that of the old, I am not, of course, taking into consideration the additional comforts and luxuries of elaborate baths and lavatories. If people want sitz, spray, and shower-baths, they must expect to pay for them. However, I should be sorry to convey the impression that because the prices of certain materials have been reduced, and the work to certain water-closets simplified, that plumbers' work now costs next to nothing; for there is a very important factor yet to be considered—viz, the labour—the crux which generally baffles the best of estimators. Plumbers' wages in London are at the rate of about one-fifth more than they were a quarter of a century ago, and four-fifths more than when the Queen began to reign. The men do not receive this amount of increase in their weekly wage, for they do not work so many hours now. I am

saying nothing against this advance in wages. Intelligent, industrious labour should be properly paid for. The first great requisite in a house is its water-supply, for, as I said twenty years ago, no house can be considered safe to live in which is supplied with unwholesome water. Therefore, when water has to be stored, great care should be taken to see that it cannot be rendered impure by its surroundings, cannot be contaminated by the effluvia from water-closets, the emanations from ventilating-pipes, soil-pipes, and drains, or from the vitiated air of bedrooms and living-rooms. A proper cistern-room should be provided, with lights and openings to and from the external air, and the cisterns should be so arranged that they may be readily and periodically cleaned. For this latter purpose—in addition to any overflow-pipe required by the water company—a cleansing waste-pipe should be so fixed that the cistern, or cisterns, may not only be emptied, but rinsed out with clean water from the ball-valve. To prevent the possibility of such pipes becoming conductors of bad air to the cisterns, great care should be taken to see that their discharging ends are kept well away from open traps, sinks, gullies, and places where foul air could enter them. Apart from the great saving in cost by having a constant supply instead of an intermittent, enabling as it does the use of smaller rising-mains, and cisterns of a smaller size, and fewer in number, there is the great advantage of keeping the communication-pipes from the companies' mains always charged with water, and thus preventing them from becoming, in fact, air-tubes for communicating disease germs. In the case of an intermittent supply, under favourable circumstances, directly the water is turned off from the main in the street, the lower cisterns on the system would be supplied as they were drawn from by the water left in the mains; and it requires no great effort of one's imagination to conceive of streets sufficiently sloping for such pipes to be quickly emptied, and to remain so daily for perhaps twenty hours out of the twenty-four. In such cases—the rising-mains in large houses being often of 1½ in. bore, and even larger—the air, infected or otherwise, would pass at times even through such restricted passages from one part of a house to that of another; and also from one house to another under favourable circumstances. As the water subsided in the communication-pipes air would enter them through the open ball-valves, nature abhorring a vacuum. And the air which would be thus sucked into the pipes would come, of course, from the air which surrounded the cisterns, and where such cisterns were in open contact with the air from bedrooms and water-closets, it could hardly be pure, and might be dangerous. No doubt any air currents set up through the empty main in the street and the communication-pipes to the houses would be induced by the difference in the temperature of the different houses, one house being often much warmer than another. Fortunately, there is a redeeming point in most things, and notwithstanding that specifications direct that rising-mains shall be laid in a manner to empty themselves, they are not often so treated—circumstances intervene; the street main, for instance, stands higher than the point of ascension of the rising-main. But in cases where houses stand on much higher levels than the street main, no doubt such communication-pipes would empty back into the main in the street or road, and in streets or roads with a deep fall, the main with the water turned off would soon become empty. With a constant supply the main and the communication-pipes would practically remain always charged with water, and no such risk as we have been considering would be likely to take place. Cisterns with a constant supply can be of much smaller size than when the supply is intermittent; and generally one cistern in such cases suffices for a house with a fair-sized family. The size, of course, must depend upon circumstances. It should be equal to the keeping of all the services from it going at one time, or the service-pipe to it must be of a bore sufficiently large to supply the water at about the same speed that it can be drawn from the cistern. Where there is only one cistern in a house, and it is also made to supply the hot-water circulation, the cold-water services from it for all other purposes should be so connected that a body of water is always retained in the cistern to keep the hot-water system going, in case the water should be turned off from the main for a little while; especially should this be the case when the hot-water circulation is one with the tank-system.

Also, with a constant supply there is the further advantage of being able to draw directly from the company's main, and the water supplied to the table in this way will be found to be much cooler and nicer in every way, provided that the water in the company's main is pure and wholesome. For this purpose ½ in. lead pipe will be found to be quite large enough. When the water is soft, and would be likely to act on lead, block-tin, or tin-lined lead pipe should be used, or tin-lined wrought-iron pipe if the water company will allow it. Where the water would act on lead it would also act on galvanised iron, therefore the storage cisterns in such cases should be of cast iron or wrought iron limewashed inside, and the cisterns for storing water for dietetic purposes would be nicer in earthenware, white enamelled inside. Great care is required in selecting the course for the service-pipe. The pipe should never be laid under or near a soil drain, or in any trench in which bad or surface water could collect. Where such pipes cannot be kept at least 2ft. under ground, then, in positions where they would be liable to very severe frost, they should be laid in a trough or box made of creosoted wood filled up to the top edges of the sides with hot pitch, with which might be mixed a little Stockholm tar and some sharp sand. No lead or iron pipe should be allowed to come in contact with lime, and when such pipes pass through clay soil they should be well tarred over or be imbedded in ashes or cocoanut fibre, which will also be helpful in protecting them from frost. If plumbers' work inside our houses ended here we should not have much to fear from noxious gases in our homes; but civilisation calls for certain conveniences to be placed indoors. Now, I know of no reason beyond that of incapacity why a water-closet should not be fixed inside a house with absolute safety—safer and sweeter, in fact, than a night-stool in one's bedroom. But it is not so much a question of a night-stool v. a water-closet, or a privy or water-closet situated out of doors v. a water-closet indoors. The important question is: Can a water-closet be so fitted up that it may be used with absolutely safety in any position or place it may reasonably be required, either outside or inside a house? If I could not answer that question in the affirmative, I should not be here to-night. Living on an island, we naturally believe in isolation. We isolate all clean water pipes, such as safe-wastes, cistern-wastes, and overflow-pipes, by making them discharge into the open air. We also isolate all dirty-water waste pipes, such as bath-wastes, sink-wastes, and lavatory-wastes by exposing their discharging ends to the air outside the house, and in this matter we stand ahead of all other nations, not excepting even America. In some cases we also isolate soil-pipes, by "disconnecting" them from old and filthy soil drains, safeguarding them from the air in the drain, and giving to each soil-pipe a separate inlet and outlet for continuous ventilation. We go further than this, for we not only isolate the drain of one house from that of another by disconnecting both from the common sewer, but in some cases we disconnect one section or wing of a building from that of another, excluding any infected air which may be in one section from another, and providing independent ventilation to each section, taking care, however, that no length of drain shall remain unventilated. And we not only isolate the main carriers, the sanitary wings are now isolated from the general building. And the water-closet apartments are not only isolated, but the water-closets. The "Corbel" and the "Bracket" closet have been speedily introduced to isolate them from the floor as well as from the walls. But isolation is not everything. A water-closet may be as isolated as a sentry-box, and yet be dangerous; for in this sanitary age no water-closet can be pronounced sanitary in the highest degree which cannot be used and left in itself and in all its parts as clean and wholesome as it was before usage. To compare various points and features of the great variety of water-closets and flushing-cisterns which now exist would require several evenings, and to attempt this to-night would only tend to the confusion of our minds on a subject simple enough in itself, but which, owing to the multifarious patterns of the many manufacturers, has become a little complicated. In passing over many water-closets which have been introduced during the last ten or twenty years we shall not miss much, for the majority of them are as noisy and as unsightly as



some of the new motor-cars, and to the olfactory nerves are just as objectionable as the pan-closet they were meant to supersede. I propose, therefore, to confine my remarks to a few kinds—viz., the valve-closet, the "Syphonic," the "Wash-down," and the "Wash-out"; but before doing so, let me mention the several points which I consider essential to a good water-closet.

- (1) It should hold a body of water large enough and deep enough to quite submerge the faeces.
- (2) It should have no parts or places in it where faecal matters could cling to or accumulate upon.
- (3) It should have a water-seal of at least 1½ in. for trapping off the soil-pipe.
- (4) It should be so constructed that the whole of its contents may be changed by a flush of two gallons of water, and its interior parts well washed.
- (5) And in the case of earthenware closets having their basin and trap in one piece, its connection with the soil-pipe or drains should be readily seen.

Now, if we examine the general kind of "wash-out" closets, we shall see that they all, more or less, fail in some one or more of these important points. In the majority of such closets, if not in all of them, it will be found that the water held in the bottom of the basin is too shallow to cover the faeces, the consequence being that the portion which is not submerged throws off a vapour—its temperature being generally greatly higher than the air of the apartment—which soon fills the place with an odour, objectionable to the then occupier, and most repulsive to the next comer immediately following. So pronounced is this, that on making an examination it is rarely necessary for a sanitarian to do more than put his head into an apartment where this kind of closet is fixed, to know that it is a "wash-out." Then in this kind of closet the flush of water is made to break up the faeces in the best possible way for throwing their odours into the apartment, and instead of spending its full force upon the sides of the basin and upon the trap, it is chiefly spent in clearing the bottom of the basin. There is also the evil of a large exposed surface between the weir of the basin and the water-seal of the trap, a part which will generally be found to be in a filthy state. Having dismissed the "wash-out" kind of closet, let us now see what can be said for its next of kin, the pedestal "wash-down" kind. There is a very great variety of them with several points common to them all, and yet they differ so much in certain essential features that, like Jeremiah's figs, "the good are very good indeed, the rest are not fit for pigs." In one particular they all stand at a disadvantage with the "wash-out"—viz., that their exposed surface of water is smaller. But the best of their kind may be said to pretty well embody the points required in a good general sanitary water-closet. They are to be had of many a manufacturer, each one claiming some feature or advantage not possessed by others. In the example before you my assistant will soil over the whole of its interior exposed surface and will test it with a dozen pieces of paper, using only two gallons of water, and you will see that the closet and trap will be left free of the matters put into them. And as it is more difficult sometimes with such closets to wash out a few pieces of paper of the size of postage stamps, he will try it again and show you that the closet stands both tests equally well. Several variations of "Syphonic" closets are now in the market, the main object with them all being to provide a larger exposed surface of water than can be given to the "wash-down" kind; but though such closets excel the "wash-down" closets in this particular, they are not so satisfactory in some other points. The majority are not so simple, nor so reliable in their action with only a two-gallon flush of water, and some of them are complicated in their supply and discharge arrangements. In testing such closets with a pailful of water emptied quickly into them, I have seen them left with a much reduced water-seal even when they have not been attached to a soil-pipe; and how they would withstand the action of siphonage when fixed in about the middle part of a stack of soil-pipe 80ft. or 100ft. high, I should hardly like to say, but I should be apprehensive of the result. I know of an instance where a syphonic closet was put into use during the time its soil-pipe was under a smoke test, and the smoke escaped through it into the water-closet apartment. But, perhaps, this is hardly to be wondered at, for under certain conditions, the contents of the closet are siphoned out very vigorously, so much so that the water-seal of the trap would often be broken in the action. The emptying of a pailful of slops into such

closets not only siphons out their previous contents, but the added slops as well, leaving the basins practically empty, in which state they would at times be used, when the faeces would fall upon dry basins; for, no doubt, the servants would not always remember to pull the flushing handle after emptying the slops, especially as there would be no necessity to do so to get rid of the liquid. Then, unlike a valve-closet, the water held in the basin is in continuous contact with the air in the soil-pipe; but this is the same in "wash-down" closets. Then when the water is limited to two gallons, it is important that the whole of such a flush should be utilised for washing down the walls of the basin and cleansing the trap; but in the majority of the syphonic closets it will be found that part of the flush is used for starting the siphon in a compartment outside the basin. Then a close examination of the majority of such closets when in action will show that their sides are not properly rinsed, and that, in consequence, particles of matter are left adhering to the surfaces, and that even some of the rinsed water is returned back into the closet when the syphonic action has been broken. But, of course, a second flush would make this all right. It is better that such closets should have a flush of not less than about three gallons. Before I pass away from the classes of water-closets which may, and which often are, connected to soil-pipes and drains by imperfect joints, I should like to say, as strongly as I can, that no closet or trap having a breakable outlet—such as earthenware—should be connected to a soil-pipe or drain in a manner that will not admit of a ready inspection. I now come naturally enough to valve-closets, the prince of water-closets for private use, and for places where such a convenience is not used for several days together and when the supply of water is not limited to two gallons. The "Bramah" valve-closet was invented by Joseph Bramah, of London, in 1778; but it has been much improved upon since then, especially during the last ten or twenty years. In turning out some drawers recently, I came across a printed circular of a valve-closet, by the founder of my business, which was established upwards of a century and a half ago, and I have thought it of sufficient interest to reproduce upon the screen to-night for you to see. It was printed by T. Bensley in about 1790, I think. His printing press was next to Dr. Johnson's house in Bolt-court. If you look at the type you will see that the long S is used—and the Caslon Foundry abandoned that form of letter in 1785. The illustration shows a D-trap under the closet; but, according to the text, this trap was at that time called an "Air" trap, and although they seem to have preferred that its position should be immediately under the floor of the closet, they do not seem to have been very particular about this, for in the directions for fixing, it is specified to be "fixed under the floor of the closet, if the joists are of sufficient depth to allow it; if not, it may be fixed at the bottom of the funnel-pipe." It is interesting to notice that at this time the soil-pipe was called "funnel-pipe"—the name by which it is still called by some old plumbers—and what is still more interesting, as shown by the circular, the conservatism of that day was very strong, for they stored the sewage in cesspools built at the bottom of funnel-pipes inside their houses. But they saw a danger in this, unless matters were well suppressed, for the specification states that "great care must be taken to make properly good round the bottom of the 'funnel-pipe' where it enters the drain or cesspool so as to entirely prevent the foul air from being emitted." There is nothing said about the ventilation of the soil-pipe or of the cesspool; the authorities were content to "bottle up" such matters, and there was wisdom in this with so much storage of sewage in closet-trap and cesspool. But I must return to my subject. I have called the best kind of valve-closets the prince of water-closets, and I have done so because I know of no other which embraces so many good points. It has a larger and deeper body of water than any other closet, for receiving a motion, submerging it, and carrying it away in a water envelope; whilst the valve which keeps the water in the basin enables its sides to be so extended that they are practically protected from the dejecta, no matter what state the body may be in. And to protect the flushing rim of water-closets I have recently introduced a receding rim. Then, with the attached supply valve, at the same moment of time the closet is discharged, a very vigorous flush of water is made to cleanse

the whole of the interior of the closet together with its trap; and not only so, the sides of the basin are rinsed down at the same time, so that not a vestige of foreign matter may remain behind. Then the valve-closet is superior to all other closets, whether of the "wash-out," "wash-down," or "syphonic" kind, in that its basin water—the water which is open to the apartment and the house—is separated from the water which stands in the closet trap, in fact is "disconnected" from the water which is exposed to the air in the soil-pipe, as shown in section upon the screen, which is an illustration of a valve-closet which I have had specially made for fixing upon fire-proof floors, and places where it is desirable that the floor under the closet should remain intact. There is also another great advantage attending a good valve-closet—viz., with an efficient lead trap under it having a wiped soldered joint to the lead soil-pipe there will ever be a reliable connection with the soil-pipe, and a reliable water-seal—so reliable, that the trap and its jointing may be depended upon for many generations. In the case of earthenware closets with earthenware traps in one piece—the pedestal kind—or in two pieces, it is not so, for there is not only the risk of a breakdown of the connection with the soil-pipe, but there is also the risk of the breakage of the closet itself, its trap, or its basin part, which would mean a defective water-seal or no protection at all from the soil-pipe air, pending the changing of the closet for a new one. I know that some authorities have been content to fix valve-closets without a trap between the closet and the soil-pipe; but it is astonishing what may be done in the name of sanitation. Now, though something may be said in favour of fixing a valve-closet without a trap on a very short length of soil-pipe which has its discharging end open to the air, what can be said in favour of such a closet fixed upon a long length of soil-pipe into which other valve-closets discharge, with no trap to any of them? And yet scores have been so fixed. Only within the last few months I know of such cases where the closets have had to be resanitated. I will not insult you by arguing in favour of fixing traps under water-closets—that is a sound principle conceded by us all; but I shall be glad of your attention whilst I demonstrate the fact that a round pipe-trap—the siphon trap, the kind often fixed in ignorance of its behaviour—under certain circumstances loses its water-seal, and for a time ceases its work of safeguarding the house from the soil-pipe, and perhaps the drain as well. With a round-pipe or siphon trap the discharges pass through it in so unbroken a form and with so much momentum—gained in the fall from the closet basin—that the combined action of siphonage and momentum is not arrested in time to leave sufficient water in the trap to reseal it. With an "Anti-D trap" the water is just sufficiently broken up at the outlet of the trap to retard both the action of momentum and siphonage, for insuring the retention of an efficient water-seal, no matter how small or how large a body of water may be sent through it, whilst to insure an entire change of the previous contents of the trap its body part is purposely made smaller than its inlet; and as it holds about 40 per cent. less than a 4in. siphon-trap, I need hardly say which is the more wholesome of the two, although both kinds may be considered as self-cleansing. By the favour of the Worshipful Company of Plumbers I have here an apparatus which the company fitted up at King's College in connection with their museum and workshops—these for the extension of the technical training of student plumbers. Next to the importance of an efficient trap to a water-closet is an efficient water supply, for the best closet in the world may not only be marred, but may be ruined, by the want of either. To expect two gallons of water to carry a motion through the closet, trap, branch soil-pipe, the vertical stack, and a long length of branch drain to reach the main carrier, and not leave a vestige of filth behind, is expecting too much. The fact is, if the water-flush is to be efficient it must be made to depend somewhat upon circumstances, upon the necessities of the case, and that only where water is scarce, or where it is imperative to economise its use in order to maintain a general supply to the house, should it be limited to two gallons. Two gallons of water with an efficient flushing cistern may fairly suffice for the best kind of wash-down pedestal closets with small water areas, when they are situated near to the main carriers with a general flow of water in



them, or into which copious flushes are automatically and frequently delivered. But two gallons of water are insufficient for water-closets which hold a good body of water, especially when they stand or are fixed at any great distance from the main drain—that is, if the soil-pipes, drains, and ventilating-pipes are all to be kept clean and wholesome. In my own house—I pay by meter—I have valve-closets for the best closets with the water supply so arranged that each user may give a flush of two, three, or four gallons very rapidly and at pleasure, and during the thirteen years that I have occupied the house I have never had to pay extra on that account. I say this to encourage water companies in giving a larger license to consumers. As only, however, two gallons of water are allowed by most companies, it is most important that this quantity should be utilised in the best possible way, and as there are flushing-cisterns and flushing-cisterns, only the most efficient should be used. You all know well enough what difference there is in their discharging power; I have here one taking not quite five seconds to discharge, the size of the flushing pipe being 1½ in. and the cistern being nearly noiseless. A properly-fitted valve-closet, with an attached supply-valve and bellows regulator, is the least noisy of all water-closets, and when it is so fitted up that the lid of the inclosure can be put down before the handle is pulled, it is practically noiseless in its action. It is so arranged in my house, where, for the sake of convenience and for good general flushing when necessary, the service to it is taken from the general service-pipe to other fittings. When this is properly done, I do not see how any contamination can take place; but, as it is most difficult to always rely upon things being properly done, it is better to separate the water-closet supply from all other services. When the cistern for this purpose would have to be fixed in the water-closet apartment it should be kept as small as practicable, holding only about half-a-dozen gallons of water, so that its entire contents may be frequently changed, for, notwithstanding any lid it may have, the effluvia of the apartment would gain access to the water and taint it. Where a good flush is desired, and the head of water would be under 5 ft. or 6 ft., the service-pipe to the closet should be of 2 in. bore. If we were not influenced by fashion, or carried away by the current of things, I should wonder much why pedestal closets with narrow ring seats ever came into vogue for the best closets in private houses, especially for ladies' use, for I suppose the least observant must know that it is cleaner and nicer for a lady's dress, especially with a long skirt, to rest upon the dusted seat of an enclosure rather than upon the floor, remembering what closet floors are like at times. With a table-top closet basin projecting the inclosed space, and with an air-tight joint to the top of a nicely-fitted inclosure, not only is the vapour excluded from the space inside the inclosure, but dust, and the sweepings of the apartment, as well. And with such an arrangement no cold draughts can blow upon the person using the closet. And even for the use of men, when they are feeble or advanced in years, a table-top pedestal closet affords a better means for raising themselves from the closet than the ring-seat, allowing them, as it does, a firm place to rest their hands upon. Before leaving the subject of water-closets, I ought to say something on the apartments in which they are fixed. The apartment in itself, apart from the closet, may become an accumulator or disseminator of disease. Dark and dangerous water-closet apartments may be found with the aid of a candle in the interior parts of old mansions with no natural light or ventilation. The vapour generated in them, or escaping from the closet apparatus, may be as difficult to remove as air out of a bottle. One side of a water-closet apartment should at least stand next the external air, having a window in it reaching up to the ceiling. Where it would be much used it should be provided with independent ventilation—should have, in fact, an air inlet and an air outlet. It is important that the walls and ceiling should be made practically air-tight, and that there should be no places or parts about them where dust could collect and accumulate. And in public water-closets, and in water-closets which would be liable to be used as urinals, the floors should be impervious. For the best water-closets with inclosures, and for table-top valve-closets in private houses and important positions, a floor of solid marble from wall to wall, or to a point 6 in. or so beyond the sides and front of pedestal closets,

is very desirable. The marble is sunk a little to catch any little leakage of the supply-valve, should such ever occur, and carry it away by an overflow pipe fixed to the floor, and discharging into the open air. Where marble cannot be afforded, the boarded floor inside the inclosure should be protected by a lead safe to which the lead trap under the valve-closet should be soldered. The overflow pipe from the safe being a clean-water pipe can be utilised for introducing a constant stream of fresh air into the apartment; but when this is done in exposed positions, the grated opening in the marble floor should be kept outside the inclosure, so that the incoming air, when frosty, may not come directly in contact with the service pipe, service valve, or closet basin. I now come to soil-pipes. According to the by-laws of the London County Council, under seal dated June, 1893, all soil-pipes in buildings erected after that date are to be outside. Now, although I have done, perhaps, as much as anybody to encourage the fixing of soil-pipes outside, and still prefer such pipes to be outside, I have never slavishly chained myself down to such a restriction, and I think it is a pity the by-law should be so stringent, or that architects and plumbers should be so hampered, for it requires no great imaginative power to conceive of circumstances where the disadvantages would be greater than the advantages. If it is a question of durability and sanitarianess, in certain cases a soil-pipe fixed inside a house would be more durable and more sanitary than if fixed outside. When they are situated on south fronts, where no shadow protects them, they often become so hot that the naked hand cannot be kept upon them; and their variation in temperature from mid-day to midnight in the summer months would be three times greater than upon pipes fixed inside or with a northerly aspect. The strain upon the joints of iron pipes and the unequal expansion and contraction of lead pipe would tell much upon their durability. And, of course, in such cases, sewage matters would adhere and dry upon the soil-pipe in a different manner to that upon a pipe which did not become so heated, and it would, therefore, be less sanitary, unless, indeed, the water-closets upon it were well flushed at every usage by more than the water companies' restricted two gallons. Then, in certain cases, it is most difficult to find a good course for an outside pipe, free from a doorway or a pilaster, free from mouldings and enrichments; difficult to prevent it disfiguring the building. So ugly are they at times that they must lower the value of the property on which they are fixed. They are to be seen here, there, and everywhere in hideous fashions, being fixed neither vertically nor horizontally, nor in any pleasing line, crossing chimney breasts, coming out over stringings, cornices, roof-gutters, and parapets, going up to the roof o'er all the obstacles of their course victorious. Then often no attempt is taken to disguise their purpose. Branches from water-closets are brought out, and carried along on the face of the wall to the main pipe; whereas, a little alteration of the water-closet apartment, or a little shifting of the water-closet, or a little graceful bending of the main pipe, or a dexterous treatment of the branches, and they could have been brought through the wall, and soldered to the back of the pipe, where they would never be seen. Now as to the material of which soil-pipes should consist. For my own house, though I were as rich as Croesus, I should be content with lead pipe, and I should prefer it to any other kind of pipe that I know. I should be satisfied that the pipe was more wholesome than iron, being easier cleaned, and more durable, being less corrosive, and that its wiped soldered joints could be more relied upon than even the caulked lead joints of cast-iron pipe, and remembering that they are much fewer in number, there being at least two more joints with iron pipe than with lead in every closet branch. In fact, when the main pipe is of iron and the branches of lead, there would be four joints to every junction, as shown; for the London County Council rightly enough require such connections to be made with a brass ferrule on the face of the external wall. But whether the branch be of lead or iron the joint with the iron junction should never be allowed to come into the wall as shown in the next photograph. Then, with iron pipe there would also be more joints on the main pipe; lead pipe being made in 10 ft. or 12 ft. lengths to suit circumstances, and the iron pipe as generally used in 6 ft. lengths. Then the character of lead pipe compels the

plumber to connect the ends neatly and nicely together, if he is to make a well-wiped soldered joint upon them, and with such yielding material as lead he has no difficulty in doing this, for he can bend or boss or alter either end at will, and rasp them to a great nicety; whereas, with a rigid spigot or socket end of a cast-iron pipe, what can he do when the two pipes do not come together in true correspondence in their interior surfaces, or when he has been a little out in his measurements? The pipe may be a little too long, or too short, but he cannot alter the socket, nor can he tamper with the spigot without destroying the bead or shoulder which is to keep the caulking material from getting into the interior of the pipe. Indeed, he may aggravate the case in caulking in the lead, by shifting the upper pipe away from its true bore with the lower pipe, and so leave a shoulder inside for matters to catch and collect upon. In my house in Newcastle-street there is a stack of 4 in. soldered seam lead soil-pipe which was fixed more than a century ago, and I see no reason why it should not last as long again. It is made of cast sheet lead about ¼ in. thick. The exterior is splashed over with the many whitewashings given to the cellar during the century, but the pipe is quite sound and good, and fairly clean in its interior. A Bramah closet discharged into it on the second floor, and was, I expect, in daily use for three-quarters of a century, when it was changed, together with its D-trap, for a "Vortex" closet, since when it has only been in use six days out of seven. But we all know how well lead pipe stands the London atmosphere. I will show you a photograph of a lead R. W. head and pipe which was fixed on the old Dining Hall of Staple Inn in 1655, and also of another head and stack which was fixed on the chambers in the same Inn in 1729, both being in very good condition today. I will also show you a photograph of a stack of lead soil-pipe, fixed in 1881, and that of another fixed in 1883, both being straight and good to-day, and showing no sign of deterioration. To prevent sagging and "telescoping," lead soil-pipes should be well supported about every 5 ft. with a pair of tacks, and the strength of the pipe should be equal to sheet-lead weighing 8 lb. to the superficial foot. For every unsound soldered joint on lead soil-pipe, I should expect to find a thousand unsound cement joints in cast-iron pipe, and even when a joint is made with great care in iron pipe, after a time it is liable to breakage by the expansion and contraction of the pipes as shown. The pipe generally used is of insufficient strength, and is liable to fracture. But I have no desire to unfairly decry iron soil-pipes, especially when such pipes are of good strength (½ in. metal for outside situations), and the joints are well and carefully made with blue lead or Spence's metal. In fact, where hot water is discharged into a soil-pipe, lead pipe with soldered joints would not stand the continual strain of expansion and contraction; and, therefore, iron pipe would be much preferable in such cases. But hot water ought never to be discharged into soil-pipes. In America, not only are the baths and lavatories discharged into soil-pipes, but also the sinks; but we can afford to treat plumbers' work more sanitarily: we can carry the waste-pipes from such fittings through the open air and discharge them into intercepting traps, for we are not subject to such severe frosts. All soil-pipes, no matter of what material they are made, should be carried up at least full-bore to the highest parts of the roof, where the air coming out of them would have no chance of getting into the house, and where the wind from any point would blow over them to carry the bad air away. Now, as to the size of a soil-pipe. Before determining the size of the pipe, it is important to know what it has to do. If, in addition to its work of carrying away the discharges of a tier of water-closets, it has also to act as a ventilator to the drain, it ought not to be less than 4 in. And if no siphonic action is to take place in it, that is, if no anti-siphonage pipe is fixed to its trapped branches, it should be of larger bore still—5 in. or 6 in. pipe. And even this size would not be large enough to prevent siphonage when the air had to come down a long length of piping, as in the case of a very high building, unless its upper part—the ventilation pipe—was of a bore still larger, for the air to pass down the pipe free from friction and in a body sufficiently large to prevent a vacuum. When no anti-siphonage-pipe is fixed, and the main soil-pipe is only 3½ in. or 4 in. bore, it is of paramount importance that only water-closets which have special traps should be fixed



which means a deeper seal and a larger body of water. Now, except in the case of valve-closets, the water-seal of a closet is in open contact with the air in the soil-pipe and the drain; and where the closet is not in constant use the water held in its trap would become tainted and surcharged with gases. It is, therefore, important that the whole of this water should be changed every time the closet is used, and I do not see how this is to be done satisfactorily with a two-gallon flush, if the water-seal of the closet-trap is to be of a depth great enough to withstand the action of siphonage without the aid of an anti-siphonage-pipe, and the closet is to be left with its full water-seal. Moreover, without anti-siphonage pipes there would be no ventilation of the closet branches no matter how long they might be. The ocean of air surrounding every house ought not to make it too difficult to give full and free ventilation to every soil-pipe, waste-pipe, and drain; and in such a manner that no air coming out of either outlet or inlet of the system should enter the house or be breathed before it has been well broken up and purified. When many stacks of soil-pipe are directly connected to one large system of drains, having only one low-level inlet upon it—viz., at its "disconnection chamber" with the sewer, the several stacks will not have such currents of air in them as they would if each drain into which each stack discharged had its own independent inlet, especially when all the stacks are of equal height, and the air in them is about equipoised, though there is generally some different influence acting on one pipe more than another. I say no more on ventilation, except to remind you that, like money, there can rarely be too much of it where it is most needed. The by-laws of certain district councils require the waste-pipe from every bath, sink, or lavatory, the overflow-pipe from any cistern and from every safe under any bath or water-closet, and every pipe for carrying off waste water, shall be taken through an external wall, and discharge in the open air over a channel leading to a trapped gully grating at least 18in. distant—that is, such authorities prefer insanitary methods to sanitary ones, for such treatment is sure to lead to a nuisance. Soap-suds and bits of soap will generally be found decomposing and throwing off bad air, and often bits of paper, orange-peel, hair, and the like will also be there, blocking up the grating, offending the eye, and needing almost daily attention to keep clean. The ground, too, surrounding such gullies will often be found to be quite sodden with splashings and overflows. Whereas, with such waste-pipes made to discharge into self-cleansing intercepting traps just under the grating, no mess would be made, and no attention needed to keep the surroundings clean. And when such waste-pipes were properly trapped and ventilated their air disconnection would be all that could be desired. No doubt some years ago there was a reason for keeping the discharging ends of the waste-pipes well above a gully when the latter was generally a little cesspool in itself, and when waste-pipes were often fixed without traps, in which condition they acted as ventilators to the house. But no such reason exists now that self-cleansing intercepting traps are generally fixed, and that the waste-pipes are trapped. And yet only the other day a board surveyor, against his own judgment, caused some waste-pipes to be altered, because they delivered under the grating of a drain interceptor, instead of over it; that, too, notwithstanding the fact that each waste-pipe was trapped. A soil-pipe may discharge directly into a drain, which may have no air disconnection within several hundred feet of the soil-pipe, although there be but the water-seal of the closet trap between the drain and the house; but for a waste-pipe to have its air disconnection under a grating—oh, blissful ignorance! No sink, bath, lavatory, or other fixture through which dirty water may be emptied, should be fixed without a trap of a self-cleansing kind, and one that will, when properly ventilated, retain an efficient seal no matter how large the body of water may be which is sent through it. And to prevent the discharges of one fixture backwashing up into the waste-pipe of another and fouling it, each fixture should have its own separate trap, which should be situated as close to it as practicable, so that the piece of outlet pipe—standing between the house and the seal of the trap—may be as short as possible. As only a very short of length of unventilated waste-pipe is sufficient to cause siphonage, the upper ends of

such pipes as well as their discharging ends should be carried through the external walls to the open air. To show how small a fall suffices for this, I have here a little lavatory with 1½in. siphon trap and a short length of 1½in. waste-pipe, with its discharging end standing only a little below the bottom of the lavatory trap, and yet the drop is sufficient to set up siphonage and to leave the trap practically unsealed with but a small discharge from the basin. Opening up the upper end of a waste-pipe to the air not only prevents siphonage, it also ventilates the pipe and keeps it wholesome. Where more than one trap is connected to a waste-pipe through which quick discharges may pass, it is not sufficient for the upper end of the main pipe to be carried through full bore to the open air to prevent siphonage; each individual trap must be ventilated—must have an anti-siphonage pipe, in fact. Most authorities are now alive to the value of providing quick discharging arrangements to baths, sinks, and lavatories, though only the other day I came across a small wash-hand basin which took nearly one minute to empty. A 5ft. 6in. bath ought to empty under two minutes, and where it would be in daily use, and was situated near the head of the drain, as the chief means of flushing it, it might be made to empty in one minute, a 3in. waste-valve being fixed to the bath for the purpose, and the trap and waste-pipe of equal bore. When circumstances require a soil drain to be fixed inside a house, or outside it, where a leakage from it would find its way into the house or under the footings, I should strongly prefer it to be of cast-iron, with caulked lead joints, rather than of stoneware—whatever kind of joint might be adopted—the thickness of the cast-iron pipe being not less than ¾in. in its thinnest part for 4in. or 5in. drains, and greater still for drains of larger size. Some authorities still prefer stoneware drains to iron, even for fixing inside a house. It would be almost impossible to find anywhere a stoneware drain of any great length inside a house absolutely water-tight from end to end, which has been in use for, say, fifteen years. Even when every precaution has been taken, and a stoneware drain has been very carefully laid, and its joints specially made, one could not be certain how long it would remain perfect. And the misfortune in such cases is that such leakage or leakages are generally difficult to repair, and are practically impossible of repair without danger of doing further injury to the drain. I have just had a cast-iron soil drain examined which was fixed inside a house in the City 26 or 27 years ago by my firm. The pipe is of water-main strength, and is suspended from the ceiling joists in the basement. Both the pipe and the caulked lead joints were found in excellent condition, nothing having been done to them from the time they were executed, except that in whitewashing the basement the drain had also been whitewashed from time to time. In 1881 I had some manholes built in brick and cement on the first floor of my offices as examples, together with some sanitary fittings, and a specimen length of iron drain. I had a photograph taken of certain parts before their removal last year, and the iron pipe and the caulked lead joints are quite good, and show no sign of wear, though they were experimented with for fifteen years. Also, though apparently no action has taken place between the lead and the Portland cement, which connected a piece of lead soil-pipe to the stoneware drain, the cement joint shows that there was no real adhesion of the cement to the glaze of the stoneware socket, and this accounts for the leakage which quickly showed itself when tested with water. Notwithstanding that many authorities require that even cast-iron drains should be imbedded in concrete, I consider such treatment a wicked waste of money, for with a pipe of proper strength all the support it needs is from its underside, except in very exceptional cases, and this is best done by brick piers built on concrete bases, with a stone or concrete resting slab for the pipe to nicely fit in, or by making a continuous bed for the drain in Portland cement concrete. This arrangement readily admits of the removal of the earth surrounding the drains and the joints for any future examination of the pipe, and for recaulking of the joints when necessary. When such drains are incased in concrete the cost of cutting away the concrete to find out a leakage, or to get at the joints, would lead to great expense, and do damage to the drain. Where practicable, instead of laying an iron drain in the ground, where it is inside a house, it is better that it should be

carried on the face of some wall, or be suspended from a floor, or be carried in a subway, or have a tunnel or creeping trench specially built for it, in brick and cement, with openings into it only from the external air, so that the drain may be readily examined, and in the latter case be completely isolated from the house. The many improvements in sanitary plumbers' work which I have brought before you to-night, or to which I have alluded, as well as many others which I have had no time even to mention, have almost entirely been made during the latter half of the long and magnificent reign of her Majesty. And when writing the finishing words of this paper, it occurred to me that instead of attempting any kind of peroration, the better thing to do would be to drop the pen for the pencil, and portray in a sort of transformation piece, the progress of plumbers' work between 1837 and 1897. Before showing this set-piece, I should like to remind you of the great power you possess for raising and maintaining the standard of plumbers' work. Other authorities may desire it, may even expect it; but architects, from their privileged position as advisers, and as the designers and directors of building works, can demand it—can to a large extent secure it, by providing for it in their specifications, and by being prepared to properly pay for it. And though plumbers may not everywhere throughout the country be equal to the demand for very high-class work, they will be much stimulated by the desire of architects for such work. At any rate, more than any other class, more even than medical men, can the architect aid the plumber in making our homes healthy to live in. When the hand-worker—greatly interested in his work—produces with skill and intelligence what was required of him, what was portrayed to him by the head-worker, he is ever so much helped by some appreciative acknowledgment, however slight; and a word of praise to the deserving—how good it is! Like mercy, it is twice blessed. Gentlemen, in your works may it be your privilege to make the workers happy in their work.

At the close of the paper a vote of thanks was cordially passed to Mr. Hellyer on the motion of Messrs. FRANCIS G. F. HOOPER and G. H. FELLOWES-PRYNNE, supported by Messrs. W. E. BLAND, of Newcastle-on-Tyne, OSBORNE SMITH, and the PRESIDENT.

#### "BUILDING NEWS" DESIGNING CLUB.

A DISTRICT COUNCIL HALL.

**S**UITABLE buildings, or at any rate special buildings, sooner or later will have to be built more or less over the whole of the country where District Councils are elected, as accommodation is demanded to provide for the local district work which these bodies have to see carried out. County Council buildings have been in some places projected, but not yet built; in many they have been completed and opened long since. Not a few councils, County as well as District, are housed in offices quite inadequate for the purpose; and consequently the public work is not carried on to the best advantage or convenience of the ratepayers, who, not infrequently, to keep down the rates, and acting with short-sighted narrowmindedness, prevent improvements of the kind being realised, or they agree to a half-and-half compromise to avoid expense, whereas, in the end, a far greater outlay is the consequence. The accompanying design, which we have placed first in our monthly competition, aims at providing the sort of accommodation required by a District Council for a county district. We cannot illustrate the second design because it seems hardly to merit publication, and the first design by "The Dingo" is by no means an ideal scheme. "Nap" is the motto of the design to which we have given the second position, and "Nut" comes third. "The Dingo's" building would probably look better in execution than it does here, in spite of the decidedly poor details and indifferent grouping which mar the design. The conditions were as follows:—A District Council Hall for a Country District with moderate requirements. The buildings to comprise an assembly-hall, 70ft. by 30ft., with two retiring-rooms and a recessed stage or platform, 20ft. wide by 12ft. deep, adaptable for dramatic performances as well as public meetings. A council chamber, capable of seating 18 members, two officials, as well as the chairman at a horseshoe table. A separate table for the convenience of



the Press is necessary, and a small gallery for the public, with a distinct entrance. The offices to consist of two rooms for the clerk's department, and two rooms for the surveyor's department; a public inquiry counter in both cases to be provided, screened off from, but forming part of, the clerks' rooms, which should measure 360ft. super each. The surveyor's and clerks' private rooms will be about 14ft. square. A strong-room, 6ft. by 4ft., wanted in both departments, but no separate drawing office. The rate-collector's office and the sanitary inspector's office, each about 12ft. square, should also be approached from the main entrance vestibule. A cloak-room in connection with the hall is desirable, and there must be a lavatory and cloakroom, &c., for the use of the council, and another ditto for the staff. A waiting-room, too, is to be provided adjoining the council chamber, which is to be on the first floor. The porter's office is to be near the main entrance. His living-rooms may be located on a second floor if desired, but a separate staircase in that case will be necessary. Three bedrooms, a living-room, scullery, and larder, &c. Style optional. The site is a corner one in the main street, and has a frontage of 80ft. facing south, and a depth of 150ft., with a side entrance on the east return front. No projections beyond the south frontage line, so that the façade wall may be set back not more than 6ft. if desired. Economy to be observed. Materials, brick and stone. Sufficient drawings to show the design properly. Scale 8ft. for the elevations, and 16ft. to the inch for plans.

There is no endeavour in "Dingo's" design to utilise the main entrance of the building as the approach to the great hall; indeed, the offices and hall are intentionally isolated, and that so effectively as to make the only means of access through the caretaker's entrance and staircase-way. The arrangement has its advantages, and the exits are direct on to the street, but all this sort of thing could have been managed without ignoring the becoming dignity of a main entrance through the front block of buildings. The surveyor's office is too much out of the way of the main entrance, and the general "hang" of the official part of the plan is not so convenient as could be wished. The first floor is fairly convenient, the council chamber marking the centre of the façade, which is broadly and quietly handled. The stage to the big hall is not adapted for theatrical performances, and the L-shaped public entry to the hall round about the cloak-rooms is not the best form to employ. "Nap" hits off his plan in a much more businesslike way, and puts his emergency exits towards the inside of the site area, so that every street ruffian cannot knock at the doors as he passes along the street, disturbing the audience or meeting inside. His offices are better, too, in their arrangement, but his design is commonplace and uninteresting in its architectural limitations. "Nut," the third man, aims at picturesque breadth and simplicity, marking his fenestrations with a sort of Gothic suggestion in the shaped heads and mullions. His drawings are crisp and clear, the ground floor is passably moderate in merit, the first floor is bad—bad because of the waste space to landing, the wrong way of seating the council room with the hen-coop of a recess for the reporters, and bad because of the ill-contrived quarters for the caretaker. "Pickles" leaves out dormers in the view when he finds those shown on the elevation do not come quite as he expected. This is fudging. He is the first, however, who has made a good crush-space and dignified entrance to the big hall. The town clerk is located upstairs, and the council chamber is cramped and not well arranged. This competitor ought to do better, and he should observe more economy in corridors. "Pantile's" elevation is distinctly pleasing and cleverly balanced, with two oriels of lofty proportions out of the council chamber; but—and here comes in the vexatious part—the plans are ill-considered in their details and wasteful in passages space. The central hall below the open area above would make a good crush-room, of course; but the arrangement is an expensive one. The two chief officials' public offices are not in evidence enough, poked away round behind the strong-rooms. The private rooms of these two worthies are too much in evidence. "Pantile's" drawings are neat, but not effective; their author devotes thought and taste to his work; he needs must give more study to his planning if he would succeed. "Agon" is crude and commonplace; though in an unambitious kind of everyday

way he has produced a well-balanced elevation, but an ungainly plan. "Orb" comes next with projecting porches, intruding on the pavement beyond the frontage-line, and competing for prominence so that each entry, when all four are so nearly identical, would have to be labelled. His plan is not a good one. "Leonard" is beyond easy reformation seemingly, working so much as he does without method. To scheme his perspective, he sticks it in on end in the corner of his sheet. The entrance doorway is by far the best part of his scheme; indeed, it shows what this contributor can do if he likes. Perhaps he copied it. "E. G." is very ordinary, and his design is wanting in style and character, a remark which applies to his plan as well as the elevations. "Look" should learn perspective drawing, and let him look up drawings and photographs of "Late" Renaissance work before scheming such doorways and windows as these. "Percy" is better in his detail, but he hardly can claim grace or good proportions for his façades, over which he has expended the greatest care, for which we praise his endeavour, and would advise him to sketch old work and visit the best examples of new buildings that he can find. A London student has no excuse in this respect. "Manxman" puts his stage end of the big hall on to the main building, and the landing over the square entrance hall has a circular well-hole in it for light. His elevations are not characteristic of a District Council's premises. "Tyke" flanks his council-chamber by two shaped gables in the front, and a portico porch leads into a very spacious central hall, into which the main staircase awkwardly projects. "Geisha" is fantastic, and manages his ornamental gables in a high-shouldered way, while his porch is as squat as a squat can be. The rusticated blockings and flyaway keystones give the effect of a windmill, if we may speak thus airily of so ponderous and heavy a conception. "Ulan" comes next, and then "Kwajee," done in brown with an odd hexagonal turret as a sort of belvedere at the corner. The big hall has a flat over it. "Mammoth" designs in the simplest elementary way, and hardly does so with any method. The series for this subject is concluded by "Mist," who favours high mansard roofs, and has a fancy for modern French post-offices. He has not given his name and address on the drawing, which is an oversight he must make good.

#### TALL CHIMNEYS.

AT the quarterly meeting of the Grimsby Master Builders' Association, held on Tuesday week, Mr. A. F. James, the president, in the chair, a paper on "High Chimneys" was read by Mr. H. Marrows. After referring to the different local high chimneys, Mr. Marrows added:—We have some well-built and medium-sized chimneys in Grimsby, but none worth mentioning beside those to be seen in our large manufacturing towns. The highest we have does not exceed 159ft. Bradford has one 240ft., another 256ft., and then 300ft. Huddersfield has one 315ft. Dundee has perhaps the finest, architecturally speaking, which is 300ft. Edinburgh gasworks chimney (now about to be demolished and replaced by a less lofty structure) is 329ft. Messrs. Dobson and Barlow, of Bolton, have one 367ft. Our own hydraulic tower here, at Grimsby, is 320ft., but the one I have in view is very much higher than any of these. It is that of Messrs. Townsend, of the Port Dundas Chemical Works, Glasgow, and is now the tallest chimney in the United Kingdom, if not in the world. A neighbouring one in the same city, also at a chemical works, St. Rollox, belonging to Messrs. Tennant, was for some years the largest, but is now overtopped by its neighbour by 18ft. I am told there is a chimney in Saxony slightly higher than this, but as this was made in Germany we will not trouble about it, we may leave it for President Kruger, knowing the fondness of the Dutchman for a long pipe—especially if it is a German one—so long as the "old woman" does not sneeze down it. The chimney of Port Dundas was designed by its builder, Mr. Robert Corbett, of Glasgow. Its purpose was to collect the fumes and gases from all parts of the works, covering more than four acres of ground, as well as the smoke from the furnaces, and to lift them clear of the city and its environs. The total height of the chimney, from the bottom of the foundation, is 468ft. Of this 14ft. is below the ground line, leaving a clear height of 454ft. The foundations are laid on the

blue clay, found at a depth of 12ft., and which is as hard and firm as a rock. No piles or even concrete were needed, and the bottom courses consist of 12ft. of brickwork circular on plan, commencing with a diameter of 50ft. and stepped up to 32ft., all built solid except that four flue ports are formed in it at right angles, elliptical in section, and about 6ft. by 7ft. 6in. in area. The chimney is circular throughout its entire height and without pedestal or projection of any kind, except the coping. It has a batter of 9ft. 4in., or about 1 in 48. The walls for the first 60 in height are 5ft. 7in. thick, standing 9in. clear of the outer wall and covered over at 60ft. high. The upper 4ft. of this lining is pigeon-holed to prevent explosion of any overheated gases which might accumulate between the inner and outer walls and the covering over to prevent dust falling down. The next section, for a height of 30ft., is 4ft. 10in. thick, followed by 40ft., 4ft. 5in.; then 40ft., 4ft.; 40ft., 3ft. 7in.; 40ft., 3ft. 2in.; 40ft., 2ft. 7in.; 52ft., 2ft. 4in.; 52ft., 1ft. 11in.; 52ft., 1ft. 7in.; and 20ft., 1ft. 2in. The total weight of the materials used is estimated at 8,000 tons. The bricks were made of clay, ground with 10 per cent. of clinkers; they weighed 5 tons per thousand. The shaft alone, without flues, contains 1,142,000 of these bricks, and the flue brick lining took 157,000 bricks. The mortar was made from Irish lime and sharp sand mixed—1 of lime to 3 of sand, and about 3 per cent. of red oxide of iron added. The bricks were all carefully wetted, and were grouted in at every course. Iron hoops  $\frac{3}{4}$ in. thick by  $\frac{1}{2}$  broad were built in on their edges  $\frac{1}{2}$ in. from the outer face of chimney at every 25ft. The whole of the work was done by the day, and was carried on during three summers from the beginning of June to the end of October. The total time worked by the bricklayers was equal to 1,171 days of 10 hours each, and the average quantity of bricks laid was 1,200 per man per day. The coping of the chimney is of fire-clay, specially modelled, and in section is a flat-topped roll, flanged down over the inside and outside of brickwork 3in. This coping was struck by lightning on one occasion, and a portion fell to the ground, but without breaking it—a splendid testimony to its hardness. The chimney is 13ft. 4in. outside diameter at the top. The building was done from inside, on scaffolding consisting of ledges built into the walls every 6ft., and floored over, with two holes left for the passage of men and materials, which were worked by a double-friction hoist and cages. The ledges were further supported by strong uprights firmly halved in between the ledges right up from the bottom, and these eventually nearly caused the collapse of the whole structure, as they took a great deal of weight, owing to the compression of the mortar joints, and during a severe north-east gale, those on the lee side gave way, being ground into one another by the extra stress, and caused that side of the chimney to settle until the top was 7ft. 9in. out of perpendicular. This was quickly noticed, and steps taken to counteract it. The bend commenced about 150ft. from the ground, and holes were cut through the chimney on the weather or high side, at twelve different heights from the ground, and saws inserted cutting out the joints both right and left of the holes, the proprietor all the time watching the result from a temporary room behind two plumb-lines, suspended from the roof, and by these alone guiding the sawyers. As the cuts were made the stack oscillated slightly, alternately gripping and releasing the saws. The men worked continuously for twenty days at the sawing, with others to water the saws, and although during the early stage of the work the inclination increased, yet eventually it was brought back perfectly upright. The cost of this straightening was £400. There is no doubt that the chimney would have fallen, had not these measures been promptly and vigorously carried out. Two lightning conductors of  $\frac{3}{4}$ in. copper rope connected with two spires 8ft. above the top of chimney, which are also connected together by a copper ring, running round the top of the cap, are brought down into a well, and also connected to a bar of iron 3in. square, driven 8ft. into the ground. The cost of the chimney, including foundations and brickwork, was £6,000, for iron hoops and machinery £1,300, scaffolding £700, making a total of £8,000. Professor Rankine estimates the stability of the structure or its power to resist wind-pressure at 71lb. per square foot of surface on the average, the point of greatest resistance being 90lb. at 360ft. high, and the smallest, 63lb. at a height of 200ft. The chimney being circular,



the wind-pressure is very much less in a gale than on a square chimney of the same diameter. The best practice, as adopted in nearly all the largest chimneys in the country, is to build with mortar in preference to cement, though in some cases the few topmost feet are of cement. The experience of the past favours fireclay tops rather than stone or iron, as in many cases the gases and acids quickly destroy the latter. Messrs. E. Brooks, of Huddersfield, have spent over £700 on the ornamental stone cap of their large chimney, and after having had portions of it fall at different times, have now taken it down and replaced it with specially-made fireclay sections. Iron lightning conductors, too, have been proved failures. One chimney in Birmingham so fitted has been struck by lightning on five different occasions, and each time it was found that the acids had eaten the iron rod into two pieces. A platinum one was then substituted, and it has not since been damaged. The bond of brickwork employed in chimney building varies very much; but the general opinion is that a chimney has a tendency to burst or expand laterally, and so a large proportion of stretchers are generally used, varying from old English bond of every fourth course headers to as low as every tenth course. The almost universal practice is to scaffold inside the chimney, but a few large ones have been built entirely from the outside. One near London for the old Metropolitan Board of Works, which is 206ft. above ground, cost for outside scaffolding £600, while the inside scaffolding used on Samuel Fox's work at Deep Car, Sheffield, 186ft. above ground, only cost £20. Considerable difficulties are sometimes met with in taking down tall shafts if the surroundings are built up. A very ingenious and successful contrivance was invented and used some time ago at Middlesbrough for this purpose, the bricks being wanted for another purpose. An iron box or bin was placed in the bottom of the chimney, and to this a wooden spout, made air-tight, was continue up to the top of the shaft inside it of a size about  $\frac{1}{2}$ in. larger each way than the end section of a brick; they were then dropped down it, the air forming a cushion. When the box become full, the door, which closed on an indiarubber strip, was opened, and the box emptied; the spout was shortened from time to time at the top as the chimney was lowered, the spout itself also serving as a ladder by steps nailed to it.

A discussion followed the reading of the paper in which Messrs. Rushforth, Goodhand, and others took part.

## STABLE CONSTRUCTION AND SANITATION.—XVI.\*

### PIGGERIES.

AS a rule, very little attention is given to the general construction of this class of building; in fact, judging from appearances, it would seem as if the owner considered filth, fetid air, and excessive damp or moisture to be congenial to pigs, if not absolutely favourable to their welfare. Swine may be comparatively gross and dirty in their habits of feeding, but this trait is unfortunately often aggravated by making them perform the duties of a domestic scavenger, inasmuch that garbage of all kinds is given them for food; it is very probable that preconceived ideas of this description account in some measure for the lack of attention which is given to the proper housing of these animals.

The piggeries are seldom or never thoroughly cleansed, and it is frequently considered quite sufficient if any excess of manure is removed at irregular and infrequent intervals; considering the circumstances, it speaks volumes for the average vitality of pigs that they are able to thrive at all when kept in confinement under such unfavourable conditions.

Insanitary surroundings, combined with improper and unwholesome food, are undoubtedly largely responsible for the epidemics which often occur amongst these animals—viz., swine-plague, typhoid, &c., and also to the presence of such diseases as trichina, and the various other parasitic worms with which they are oftentimes infested. The prevalence of tapeworm and trichiniasis in the human intestines is largely due to the consumption of unsound and insufficiently-cooked pork. Considering that pigs are kept for the purpose of ultimately becoming human food, it is important that they should at least be main-

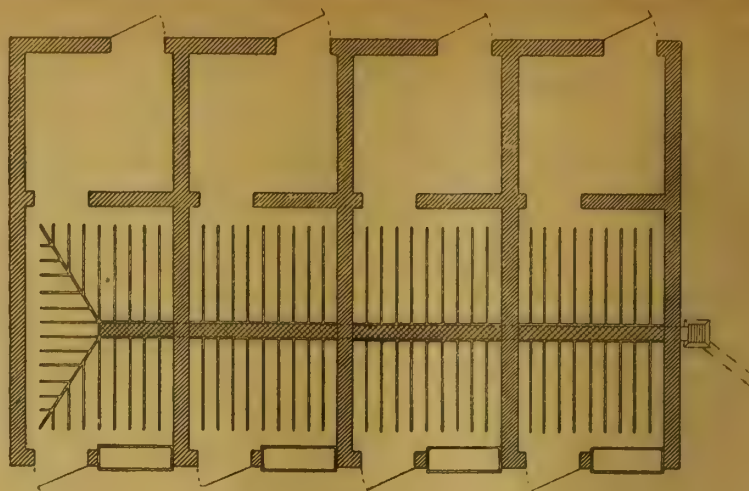


Fig. 174.

tained under such conditions that their physical well-being may not be detrimentally affected. Even from a monetary point of view, it is advantageous to provide properly-constructed buildings and maintain them in a sanitary state; for, not only are the swine less subject to disease, but they thrive better and are altogether more healthy, and consequently more marketable than when living amidst dirt and putrifying refuse.

Fig. 174 is the plan of a range of four piggies

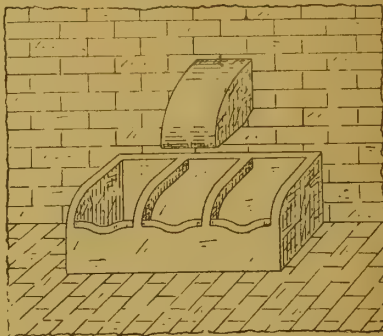


Fig. 175.

or pens. Each sty consists of a covered sleeping-place or "box" with an open run or feeding-yard attached; the walls are of brickwork 9in. thick, and the roof covered with slates or galvanised corrugated iron. To insure adequate ventilation a course of ventilating air-bricks (similar to those shown in Figs. 13 and 14) should be inserted at the eaves-level in the front and rear walls, whilst a small wooden louvred ventilator is provided at the ridge; the door at the rear of each box should be hung in two heights, so that the upper half may be opened and the interior inspected at any time without disturbing the swine.



Fig. 177.

Another advantage is that in fine weather the upper portion of the door can be fastened back against the wall, thus allowing a free circulation of air to take place within. A sliding door or falling shutter may be provided to the opening between the "box" and the yard, so as to confine the animals to the building when necessary. An entrance door to each yard is also provided, as indicated on the plan.

The floor of the piggery, both of the yard and box, should be of some hard, non-absorbent material, in order that it may fulfil the same conditions as already laid down for stable paving; any of the bricks mentioned as suitable for the floors of stables and cowhouses may be used; but for general purposes it is considered that the most satisfactory results are obtained with concrete paving of good quality, as there is an entire

absence of joints. The paving, whether of brick, concrete, or other material, should be laid on a layer of well-rammed, hard, dry rubbish; by this means the under surface of the paving is rendered comparatively dry, and any rising of ground moisture or damp will be largely prevented. The floor of each box should be slightly raised above that of the yard, and well-currented to proper falls, so that the whole of the surface drainage of the interior is discharged directly outside through the door opening.

No trapped gullies should be allowed inside the

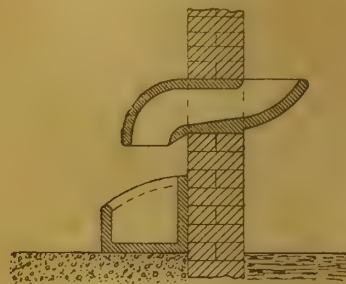


Fig. 176.

boxes or yards of the piggeries, the liquid sewage being entirely removed by surface channels to one or more gullies placed immediately outside the inclosure. In Fig. 174 a surface channel is shown passing through the centre of each yard, the paving being properly currented towards it; the main channel may be left quite open, or covered with a perforated grating, as indicated on the plan. Where it passes through the outer wall an iron grating is provided to keep back pieces of straw, &c., and to prevent the entry of vermin; a trapped gully, similar to that shown in Figs. 106 and 107, receives the liquid discharge from the main channel.

The inclosure walls of the yards are sometimes constructed with galvanised corrugated sheet-iron or iron standards and plates, instead of brick or stone. Where the latter materials are used the walls should be finished with a Portland cement skirting,  $\frac{1}{2}$ in. thick and about 12in. high, in order to prevent the lower portion of the walls becoming impregnated with sewage; the upper edge of the skirting should be weathered or chamfered, and the entire surface trowelled perfectly smooth so that it may be easily cleaned. Walls built with a facing of salt-glazed bricks also provide an impervious and easily-cleaned surface.

Feeding-troughs of iron or glazed earthenware are generally used. Figs. 175 and 176 show the elevation and section of a strong, self-glazed earthenware pig-trough, with a food-shoot built into the wall, so that the trough may be conve-

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niently filled from the outside. The ordinary form of portable cast-iron pig-trough is illustrated in Fig. 177. An improved type is shown in Fig. 178, having the trough fixed between two iron standards; the lower half of the front over the trough is hinged, and provided on the outside with a handle and sliding bolt. The trough is filled from the outside by pushing forward the

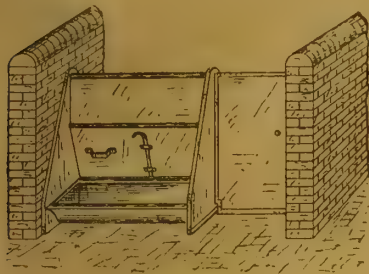


FIG. 178.

swing shutter, and securing it in that position by the bolt so that the swine cannot reach the trough during that time; after pouring in the food the shutter is drawn back and fastened to the opposite side of the trough, in order to give the animals free access thereto. The illustration also shows an iron door hung to one of the standards.

Fig. 179 shows another arrangement, differing slightly from that just described, the trough

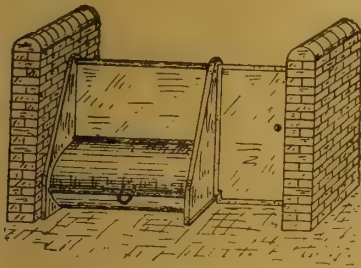


FIG. 179.

shutter or cover being made to partially revolve, instead of swinging from its upper edge.

Piggeries designed to accommodate one or two pigs each should have boxes not less than 6ft. by 6ft., the size of each yard or run being about 6ft. by 9ft. When it is intended to house a greater number of animals in each piggery the size of the

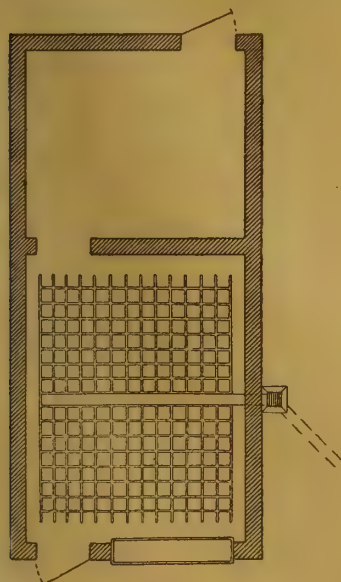


FIG. 180.

boxes and yards should be proportionately increased; for breeding purposes the boxes should be about 9ft. by 8ft. with a yard inclosure of 9ft. by 12ft. (Fig. 180), so that the young litter may have plenty of space.

A complete and self-contained piggery should include a food store, placed in some convenient



FIG. 181.

situation, fitted with a boiler for cooking the food, together with a tank in which the prepared food may be stored until required for use.

#### KENNELS.

Buildings intended for housing dogs differ somewhat in design and general arrangement according to the breed which it is proposed to accommodate. They may vary from the simple and inexpensive hutches which serve for the shelter of domestic pets and watchdogs to the extensive range of buildings required for a pack of harriers or fox-hounds. The following remarks will, however, be confined to the general details of construction respecting the erection of kennels for dogs which are kept in comparatively large numbers for sporting purposes.

Fig. 181 is a typical plan for a range of kennels suitable for a small pack of harriers or fox-hounds. The centre block comprises a feeding and boiling-house, together with extra rooms or stores on the first floor. At one side is placed two large kennels for dogs, the other side being arranged with three small houses for bitches in whelp, and a sick-box at the extreme end. All the boxes or kennels are conveniently reached from the feeding-house by means of covered passages. An inclosed and paved run is provided to each kennel, whilst beyond these a good-sized field or extensive grass run should be available in which to exercise the dogs at stated intervals.

Wherever practicable, the buildings should be erected on high and dry ground, but sheltered from prevailing winds, the runs being arranged with a south aspect.

The kennels must be paved with some non-absorbent material, possessing a smooth and easily-drained surface. Stable-paving bricks, asphalt, pressed tiles, or concrete may be used. It is desirable to lay the paving on a concrete foundation laid on 6in. of well-rammed broken-brick rubbish, so as to insure a dry surface. The whole of the floor should be laid to proper falls, together with the provision of such surface-channels as may be found necessary for the complete removal of waste liquids.

Nothing but surface-drainage should be permitted either within the boxes or paved runs. Trapped gullies must be conveniently placed outside the kennels, in order to receive the discharge from the surface-channels.

A dwarf wall about 2ft. 6in. high, surmounted by a wrought-iron railing 4ft. or 5ft. in height, incloses each of the paved runs, whilst a small gate at the further end provides a means of access from the kennels to the field or grass-run beyond. The railing must be strong, and should have  $\frac{1}{2}$ in. diameter wrought-iron vertical bars spaced  $2\frac{1}{2}$ in. apart, with  $1\frac{1}{2}$ in. by  $\frac{1}{2}$ in. horizontal upper, middle, and lower rails, the whole being secured to the coping of the dwarf wall with stout intermediate iron posts spaced about 6ft. apart. The gates are of wrought-iron bars framed together so as to correspond in general appearance with the railing. The paved run attached to the sick-box is separated from that of the adjacent kennel by means of a brick wall carried up to a height of 6ft. The paved runs are all finished with a  $\frac{3}{4}$ in. cement skirting, chamfered on its upper edge.

An enamelled iron trough containing drinking water (soft water for preference) for the dogs should be provided to each kennel in some convenient position. In the foregoing plan an angular drinking trough is shown at the extreme end of each paved run.

In Fig. 181 it will be observed that the roof over the bitch-houses and sick-box projects beyond the front wall for some considerable distance, so as to cover in a portion of the yard, thus forming a verandah. When rearing litters of young puppies, and also for invalid or sick dogs, the extra protection against the weather which is obtained by this means is of great benefit.

The kennels should be thoroughly well lighted and ventilated, for an ample supply of light and air is as essential to the physical well-being of dogs as of men. The walls should not be less than 7ft. 6in. in height, so as to afford adequate internal cubic space. Low-level fresh-air inlets should be provided near the floor, together with a



continuous ventilating course near the eaves. The warm vitified air can be simply and efficiently removed by means of continuous ridge ventilation, or by using a good type of exhaust ventilator.

A small window (size about 2ft. 6in. by 1ft. 7in.) inserted in the front and rear walls of each box will generally be found to give sufficient light. Where large-sized houses or kennels are built, additional windows must, of course, be provided. In all cases it is desirable that the windows be made to open so that the interior may be well flushed with air at any time.

It is a good plan to have the doors at the front and rear of the boxes made and hung in two heights. At night time the upper portion of the front door may be closed, the lower half being left partly open and secured in that position by means of a hinged stay-bar, so as to give the dogs free access to the paved run when necessary; whilst in the day-time the whole of the door can be thrown back and secured to the face of the wall.

The angles of the door-jambs of large dog-kennels are provided with metal rollers revolving loosely on pivots, in order that the dogs may not be bruised or injured when rushing out in a body. A similar device consists in threading a number of porcelain or metal balls (about the size of a billiard ball) on an iron bar as indicated in Fig. 182, as that each ball is free to revolve on its own axis when touched.

#### THE LONDON COUNTY COUNCIL WORKS DEPARTMENT.

THE London County Council discussed on Tuesday the report of the Special Committee on the Works Department, to which we referred last week, p. 760, giving the half-yearly return of works completed by the department up to September last, which exhibits a loss of £7,557, and also a further return just presented by the Works Committee, in which they submit the cost of certain estimated works which have been completed, but the accounts for which have not been presented to the Council. The discussion was ultimately adjourned to a special meeting to be held to-day (Friday).

The latter return deals with 14 estimated works, seven of which have been completed and certified, whilst the remaining seven have been completed and the accounts sent to the supervising officers, but have not yet been certified. On the seven works certified no large deficiencies were disclosed, whilst in five cases the work had been completed below the revised estimate. Among the works which had been completed, but not as yet certified, two or three show serious deficiencies. The most important of these was the work on the foundations at the Asylum at Bexley. The revised estimate for this work as undertaken by the department was £31,833, whilst the actual cost had been £37,578, showing an excess of cost over estimate of £5,745. Mr. Adams, the manager of the Works Department, reporting upon the causes of this large excess, pointed out that it was another case of work having been estimated under a schedule of prices far too low. The preliminaries were not priced, as they should have been, but a lump sum of £300 was put down for the clerk of works' office and men's conveniences, whereas the actual value was some £1,000 more. The preliminaries omitted were such as planking and strutting, water for works, formation of roads and temporary buildings. The prices were in many cases inadequate. The digging generally summed up to about £2,000 below what would be a fair average price. Brickwork was the cause of £1,300 excess. The way in which the works were hurried also tended to increase the expenditure considerably.

The work on the Vauxhall temporary bridge piers, the revised estimate for which amounted to £10,832, has actually cost approximately £12,590, or an excess of £1,758. There is an excess of cost over estimate of £97 on some paving works at the central depot, Belvedere-road, estimated to cost £1,583. Another large excess is shown on the Wandale branch sewer, the work in connection with which was estimated to cost £9,670, whilst the actual cost was £11,873, showing an excess cost of £2,203. The manager of the department states that the cause appeared to be due in a great measure to the extremely low prices accepted by the department. The revised estimate for the whole of the 14 works shown in this table

amounted to £61,701, whilst the actual cost was £70,782, or an excess of cost over estimate of £9,081. This actual cost included charges for plant and 6 per cent. for establishment charges.

In a further table the committee submitted a list of nine estimated works which are completed or nearly finished, and accounts for which are in the course of preparation. Here, again, some large deficiencies were disclosed. The Camberwell Coroner's Court, for which the approximate amount of revised estimate was £2,430, has cost £2,872. For work on new offices and fittings at the central depot the department accepted an estimate of £12,400 under a schedule of prices, but the work cost £14,579. One of the super-structures in the Boundary-street area, estimated at £28,168, cost £29,140. A wall connected with the Boundary-street work was estimated at £527, but cost £797. The largest deficiency is shown in the Fulham sewer work, which was estimated to cost £21,560, but actually cost £29,151. On the Whitefriars Fire Station, which was estimated to cost £20,725, there is an excess of £890. On the other side of the account there had been a saving of about £500 on the work on the central laundry at Boundary-street, and of between £700 and £800 on some temporary road work at Boundary-street. For these nine works the balance of excess over estimate amounted to £10,311, which, added to the excess given on the works in the other table of £9,081, showed the total excess of cost over estimate on these 23 works to have been £19,892. Adding to this the excess of £7,557 disclosed in the previous return, the total loss or excess of cost over estimate during the past year had been £27,449.

On the other hand, a return of the jobbing works completed by the department during the year ended March 31, 1897, showed that the schedule value of the work was £26,658, and the actual cost £24,284, a saving of £2,374.

#### BERKELEY HOTEL, PICCADILLY.

THIS commodious and old-established hotel and restaurant has been reopened, after undergoing structural alterations, and the addition of a new portion seven stories in height, on the site of 73 and 74, Piccadilly, from the designs of Mr. Robert Griggs, architect, Gray's Inn-square. The improvements include the enlargement of the restaurant on the ground floor, and a re-arrangement of the basement offices, an electric passenger-lift, and decoration. In the new part an entrance-hall has been formed, spacious lounge and cloak-rooms on the ground floor, and suites of reception, bed, and dressing-rooms, bath-rooms on the upper floors. Externally the architect has reproduced the details of the old building, with a stone portico in Piccadilly. The general contractors are Messrs. Kirk and Randall, and the constructional steel-work has been done by Messrs. Reade and Reilly. Messrs. Dennett and Ingle carried out the fireproof floors, Messrs. Campbell Smith and Co. the general decorations, and the lifts were constructed by the Otis Elevator Company.

The whole of the electric lighting, cooking apparatus, and fittings, the steam and hot-water services, have been carried out by Messrs. Strode and Co., of 48, Osnaburgh-street, and Piccadilly, the well-known electric light and heating engineers. The wiring has been partly arranged on the new patent conduit system so successfully fitted up by this firm in other hotels. No fewer than 1,000 lamps have been fitted throughout. The fittings are exceedingly elegant in appearance, and convenient for use, and have been designed by Messrs. Strode and Co. In the new restaurant in front, the chandeliers, brackets, and standards of bright-polished iron are in the Jacobean style, freely treated. These lights are in five and three groups. The table standards are very elegant with suspended lamps, the lights being manipulated from the table. The entrance-hall is similarly fitted, and the reception-room is provided with Louis XIV. gilt candle sconces. This firm have also supplied and fixed two vertical steam-boilers which supply steam to the cooking apparatus, and for heating. By an ingenious automatic arrangement these boilers provide a hot-water supply for the hotel of over 1,000 gallons per hour. The heating apparatus for steam cooking, the roasting range in the kitchen connected to a spit driven by an electric motor, gas-stoves and hot plates, cold-water supply, are other apparatus carried out by Messrs. Strode and Co. The sanitary and plumbing fittings have

been done by Messrs. Dent and Hellyer. The work has been satisfactorily carried out under the supervision of Mr. T. S. Inglis, clerk of works, within the short space of five months.

#### CHIPS.

A new organ which has been erected in the Primitive Methodist Chapel, Montague-street, Blackburn, by Mr. Edwin Smith, of Darwen and Blackburn, was opened on Thursday night in last week. The cost of the instrument was £300.

H.R.H. Princess Louise, Marchioness of Lorne, has graciously promised to open, some time in July, the Convalescent Home at Cranbrook, given by Mr. J. Passmore Edwards to the Metropolitan Hospital, London, N.E. Mr. Charles Grieve was the architect, and the builders were Messrs. Wood and Son, of Boughton Monchelsea, near Maidstone. We illustrated the building in our issue of October 16, 1896.

The late Mr. George Bridge Hilliard, the agent for the English estates of St. Bartholomew's Hospital, and one of the founders of the Surveyors' Institute, has left personalty valued at £37,187 gross and £34,638 net.

A public inquiry was held at the Municipal Offices, Harrogate, on Tuesday in last week, by Mr. Rienzi Walton, on behalf of the Local Government Board, with respect to the application of the corporation for the loan of £22,500, with which to purchase the Spa Estate.

The new union infirmary, Portsmouth, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The directors of Stuart's Granolithic Stone Co., Ltd., Regent Dock, London, Birmingham, and Edinburgh, recommend a dividend of 10 per cent. for the year ending 1896.

At the Guildhall, Peterborough, on Thursday in last week, Mr. W. O. E. Meade King, Local Government Board inspector, held an inquiry with reference to the application of the town council to borrow £28,145 for the redemption of the mortgage upon the sewage farm.

A meeting of the Housing of the Working Classes committee was held at Tunbridge Wells on Friday, when Dr. Stamford, the medical officer of health, reported that he had inspected the cottages at Harvey Town, Ely-lane, Golding-street, and Varney-street. As a result of his investigations, he reported unfavourably upon 80 cottages, and 24 cases of overcrowding as regards the air-space required by law; while as regards 50 of the cottages, he recommended that they should be condemned as unfit for human habitation. The 50 cottages are occupied by 250 people, who would thus be displaced, and it did not appear that there were anything like 50 untenanted cottages in the borough to which these people could go if these habitations were demolished. It was decided to recommend the town council to adopt Part III. of the Artisans' Dwellings Act, which would enable them to erect houses of the class required.

An inquiry was held at Watford by Colonel Marsh at Upton House on Thursday in last week into the application of the urban district council for sanction to borrow £3,700 for the purpose of purchasing "Watford-place" for a technical college and school of art.

The fine Perpendicular parish church of St. Clement, Leigh, Essex, was struck by lightning on Tuesday afternoon. The turret and belfry were entirely wrecked, and the church was filled with smoke, while the clock was demolished. A large quantity of debris blocked the steeple stairs. Three large stained-glass windows were broken. The damage is estimated at £1,000. The flag turret is in a very unsafe state, and the whole of the ivy on the north side of the building was burned away.

At Westminster Abbey, on Friday, a bust of Sir Walter Scott was placed in Poets' Corner, and unveiled by the Duke of Buccleuch, the head of the Scott family. The bust is a copy of Sir Francis Chantrey's well-known portrait, by Mr. John Hutchison, R.S.A., of Edinburgh, and has been subscribed for, at a cost of 550 guineas, by British and American admirers of the poet-novelist. It bears the inscription, "Walter Scott, 1771-1832," and is erected close to the monument to John, Duke of Argyll.

The widow of Walter Thomas Digby, who was suffocated in a sewer, where he was at work, brought an action for compensation last year against the East Ham Urban Council; but she was non-suited by Mr. Justice Cave. The Court of Appeal ordered a new trial, which took place on Monday before the Lord Chief Justice and a special jury, when a verdict for the plaintiff, with £225 damages, was returned.



## OBITUARY.

WE regret to announce the death of Mr. CHARLES JAMES PHIPPS, F.S.A., the well-known theatre architect. Mr. Phipps, who was sixty-two years of age, had been suffering some time from a complication of affections of the heart and kidneys; but as he lived above his offices at 26, Mecklenburgh-square, he was able to continue his work almost until the last, and felt, indeed, sufficiently strong to run down to Dover on Saturday, to inspect the new Tivoli Theatre there, approaching completion from his designs—his seventieth edifice of this class. During the journey he took a severe chill, which compelled him on Sunday to keep his bed, and death took place on Tuesday morning. Born in 1835, he was articled to Messrs. Wilson and Fuller, of Bath, with whom he remained till 1857, when he commenced practice in his native city of Bath. His first great work was the rebuilding of the theatre in that city in 1862, after its destruction by fire, a commission gained in competition, and one which gave a turn to all his future practice. In 1866 he removed to London, and he has since enjoyed for many years the foremost practice in theatre work. Among his buildings in the Metropolis may be named Her Majesty's Theatre in the Haymarket, opened less than three weeks since, and illustrated by a signed double-page perspective from his own hand in our issue of the 14th inst.—the Carlton Hotel adjoining is still in course of erection from his plans; the Lyric Club and Prince of Wales's Theatre in Coventry-street, forming externally one block of buildings; the Gaiety, Savoy, Comedy, Shaftesbury, Princess's, and many other theatres; the Devonshire Club, St. James's-street; the Savoy Turkish Bath; extensive flats in Portland-place; and the pavilion buildings and cloakroom at the Star and Garter Hotel, Richmond. He designed and carried out between 40 and 50 theatres in the Provinces, including the Royal and Lyceum at Edinburgh, and others at Dublin, Belfast, Cork, Londonderry, and Bristol, Plymouth, Exeter (the scene of a disastrous fire some years past), Northampton, Nottingham, Worcester, Liverpool (two), Swansea, Torquay, Leicester, Portsmouth (two), Brighton, Eastbourne, South Shields, Leamington, &c. His practice was not confined to this class of work, for he also rebuilt Lea church and added the schools; schools and a mortuary chapel at Pewsey; Leinster Hall, Dublin; the militia barracks and stores at Bath; and the Assize Courts and Guildhall extension at Swansea. Until the death of Sir Augustus Harris he held the appointment of architect to the Company of Proprietors, Drury Lane Theatre. Mr. Phipps joined the Royal Institute of British Architects as an Associate in 1860, becoming a Fellow half-a-dozen years later on his removal to London; he had read several papers before that body, and served for two years on the council. He leaves a widow, three married daughters, and one son, Mr. A. Rashleigh Phipps, the well-known electrical engineer (Rashleigh Phipps and Dawson, Gray's Inn-road). Mr. Arthur Blomfield Jackson, who has been in partnership with deceased, and who has been associated with him in his more recent works, will carry on the practice at 26, Mecklenburgh-square. We gave a portrait and biography of Mr. Phipps in our issue of April 18, 1890.

SIR AUGUSTUS WOLLASTON FRANKS, K.C.B., President of the Society of Antiquaries, died in London on Friday, after some weeks' illness, in his 72nd year. Sir A. W. Franks was the elder son of Captain Frederick Franks, R.N. He was born in 1826 at Geneva, and was educated at Eton and at Trinity College, Cambridge. At the age of three-and-twenty he published a volume of "Ornamental Glazing Quarries," containing many drawings by his own hand. At the same time he began his extensive collection of rubbings of monumental brasses which was eventually presented to the Society of Antiquaries. He acted as secretary of the Exhibition of Mediæval Art held at the Society of Arts in 1850, the first of many similar displays, and in the following year he entered the British Museum as an assistant in the Department of Antiquities. The Department was then a mere collection of odds and ends; when Sir A. W. Franks retired, it occupied more than one-half of the upper floor of the building. The post of Principal Librarian of the Museum was offered him, but he declined it, feeling that his proper vocation lay in his own department. He was not infrequently requested

by Government to give his judgment on proposed purchases for other departments besides his own. As soon as his retirement from the Museum became inevitable under the Order in Council, he was placed on the Standing Committee, and took up to the time of his death an active part in the business of the Museum. He was for some time director of the Society of Antiquaries, and editor of the society's publications, and in 1891 he was nominated president for the usual period of seven years. His chief collections are of Chinese and Japanese porcelain and English pottery and porcelain (both presented to the British Museum); drinking vessels of all materials, and Japanese works of art (both on loan at the British Museum); Continental porcelain (now exhibited at the Bethnal Green Museum); rings and gold ornaments; and book-plates. At the Fountaine sale Sir A. W. Franks joined the syndicate of gentlemen who secured for the nation the objects now in the South Kensington and British Museums. In order to give the trustees of the British Museum a lever to use with the Government, he offered to give objects equivalent in value to the special grant asked for. The works of art he then presented were worth about £3,000. His principal discovery in archaeology was to separate the work of the age which produced what he called "Late Celtic" antiquities from that of the age which preceded and followed it. He had in hand at the time of his death a catalogue of the enamels in the British Museum. Among his published archaeological works are: "Medallie Illustrations of British History," which he edited with Mr. Grueber in 1885, an edition made in conjunction with Dr. Latham of Mr. J. M. Kemble's "Horse Ferales," and a treatise on glass and enamel. The funeral took place at Kensal Green Cemetery yesterday (Thursday).

MR. GEORGE ORRELL, A.R.I.B.A., a surveyor employed in Her Majesty's Office of Works, Whitehall, London, son of the late Mr. Oliver Orrell, contractor, of Darwen, died last week at the early age of 30, at his residence 42, Studley-road, Stockwell, S.W. He served his articles with Mr. Birtwistle, architect, Blackburn, and afterwards obtained an appointment in Her Majesty's Office of Works, in which capacity he had the superintendence of the erection of large Government buildings in London. Mr. Orrell had passed the Intermediate Examination for the B.A. of the London University, and was hoping very shortly to present himself for the final examination. He qualified by examination for Associateship of the R.I.B.A. in 1889. The deceased had only recently been married. The funeral took place at Tooting Cemetery. Amongst those present were Mr. Thos. Orrell, contractor, Darwen; Mr. Lewis, contractor, Blackburn; Mr. James Cooper, clerk to Mr. Hindle, solicitor, Darwen; and a deputation of seven gentlemen from the Office of Works.

SIR JAMES CLARKE LAWRENCE, BART., the senior Alderman of the City of London, died on Friday afternoon after a long illness, surviving his elder brother, Sir William Lawrence, by a month, and his sister, Miss Lawrence, by a fortnight. He was the second son of Mr. Alderman William Lawrence, and was born on September 1st, 1820, being therefore in his 77th year. The business career of Sir James Lawrence was identified with that of his brother, with whom he was in partnership as builders in Bread-street and at Pitfield Wharf, Lambeth. On their retirement some years ago, the business, instead of being converted into a limited liability company, was handed over, under the most generous conditions, to the principal employés, by whom it is still carried on under the style of Hall, Beddall, and Co. He was elected Alderman of Wallbrook Ward on December 4, 1860, and represented that constituency until three weeks ago, when he succeeded his late brother as Alderman of the sinecure ward of Bridge Without. In 1862 he served the office of Sheriff of London and Middlesex, and was Lord Mayor in 1868-69. During his year of office he opened the Central Meat Market at Smithfield, and laid the foundation-stone of the Middle Class Schools in Cowper-street, Finsbury. He presided over the preliminary investigation at the Mansion House Justice Room of the charges against certain directors of Messrs. Overend, Gurney, and Co., whom he ultimately committed for trial. At the close of his year of office he was proposed for re-election, but was defeated by Mr. Alderman Besley. Three days before his mayoralty expired, the Queen opened two of the greatest works

undertaken and carried out by the Corporation, costing them over £3,000,000—viz., Blackfriars Bridge and Holborn Viaduct—and the Lord Mayor received the honour of a baronetcy. Sir James Lawrence was a magistrate for London, Middlesex, and Surrey; he represented Lambeth in Parliament as a Liberal from 1865 to 1885 (with a short break in 1868-74), and he was also president of the Royal Hospitals of Bridewell and Bethlehem. He also served as Prime Warden of the Fishmongers' Company and Master of the Carpenters' Company. He married, in 1887, Agnes, elder daughter of Mr. Michael Castle, of Hatherleigh-house, Clifton, by whom he leaves a daughter. The baronetcy becomes extinct.

THE death occurred at Swanage, on Tuesday week, of Mr. JAMES STIFF, of London Pottery, Lambeth, and Suffolk House, Clapham-road. Mr. Stiff, who was in his 89th year, was the head of the well-known pottery works in the High-street, Lambeth, which he carried on in conjunction with his sons. He had for many years been a member of the Loriners' Company, of which guild he had served the office of master. He always actively promoted the prosperity of the company, and some years ago, when Sir Henry Isaacs was Lord Mayor, he contributed the sum of £100 to enable the company to take part in the Lord Mayor's Show. Mr. Stiff took a great interest in educational problems, and was a member of the first London School Board, on which body he served for some time. The interment took place at Norwood Cemetery on Saturday.

MR. DAVID GREIG, senior partner of the firm of David Greig and Co., builders, Spitalfield-crescent, Edinburgh, died late on Thursday night, in last week, after a short illness. He had been in business in Edinburgh for many years, and made a speciality of the alteration of shopfronts to meet modern requirements. He was also known as a sagacious and fair valuer of house property, and in that capacity he was employed by the city in connection with the valuation of slum property taken under recent Improvement Acts and the North Bridge-street tenements. He was also a member of the Dean of Guild Court, and had frequently presided over its meetings during the absence of the Dean.

## CHIPS.

A five-storied building at the junction of Monument-street and Pudding-lane, designed by Mr. Delissa Joseph, architect, of Basinghall-street, and built by Messrs. John Allen and Sons, of Kilburn, is approaching completion. The premises are intended for mercantile offices, and are furnished with lifts.

The Bishop of Liverpool and others, with funds raised by public subscriptions, have effected the purchase of a site in Liverpool for a church-house in which the business of the diocese may be conducted. The site chosen is a block of property (about 1,060 square yards) at the corner of Lord-street and North John-street, and having a frontage also to Cable-street. It is one of the principal thoroughfares of the city, and convenient to both the cathedral church of St. Peter and the town-hall. The price paid was £48,000.

A great improvement has been effected in the dome of the Council House of Birmingham by the regilding of the lantern. The Estates Committee have discussed the desirability of gilding the ribs of the dome, which are about 100ft. in length and 14in. wide. The cost would not be very heavy—probably not more than £200, and there is no doubt it would be accepted by the citizens as a great public improvement, and add to the picturesqueness of the dome, rendering it an additionally prominent object viewed from both near and afar.

The Local Government Board have appointed Mr. James Green, F.S.I. (Weatherall and Green), arbitrator, for the purpose of settling the amount of compensation to be paid by the Vestry of the Parish of St. George's-in-the-East in respect of claims arising from an improvement scheme made under the Housing of the Working Classes Act, 1890.

A large timber structure containing tiers of seats is being erected on the steps of St. George's Church, Borough High-street, Southwark, for the Diamond Jubilee. Sir W. D. Pearson, M.P., has undertaken to erect the stands and hand over all the profits (which he guarantees shall not be less than £2,000) to the rector and churchwardens. The whole sum thus acquired will be expended on the following objects:—(1) The restoration of the church, which urgently needs repair; (2) the rebuilding of the voluntary schools of the parish; (3) the acquisition of a site for the public library, for which Mr. J. Passmore Edwards has promised suitable buildings.



## Building Intelligence.

**BODMIN.**—The free library given to Bodmin by Mr. J. Passmore Edwards was opened on Monday by the Right Hon. W. L. Courtney, M.P., who was accompanied by the donor. It is situated at the junction of Fore-street with the Beacon-road, is two stories in height, and built of local stone, with Bath stone dressings. A feature of the interior is a broad and lofty tiled corridor. This is reached from the main entrance through a small lobby, separated from the corridor by a glass screen with swinging doors. Spanning the central lobby are a series of intersecting arches, supported on pilasters of Bath stone, with moulded caps and keys. On the right of the lobby on the ground floor is a reading-room, lighted by two windows on the north and west. Further along the corridor is the lending library. The lending counter runs the whole length of a small tiled lobby, which leads out of the central lobby. On the other side of the smaller lobby is a reading-room for boys. Opposite the principal reading-room is the magazine-room. All the rooms are paved with wood blocks. From the central lobby a broad staircase leads to the floor above, on which are a museum, reference library, reading-room, a periodical-room, and a committee-room. The library has been erected by Mr. S. Trchane, contractor, Liskeard, from the designs of Mr. Silvanus Trevail, architect, Truro, at a cost of about £2,000. We illustrated the building in our issue of May 1, 1896.

**GUY'S HOSPITAL.**—The new medical schools attached to this institution, and built from designs by Mr. J. H. T. Woodd, were opened by the Prince of Wales on Wednesday. The entire building will provide under one roof all the accommodation required by the medical school, with the exception of the chemical and physical, public health, and bacteriological laboratories recently erected in association with the dental school buildings. The part of the building just opened forms about one-third of the whole structure, and consists of the three lower floors of the south wing. The lowest floor is a half-basement, 7ft. of the walls being above the ground. To the left of a corridor running the length of the building is the lecturers' room, and opposite to it the lecturers' entrance to the theatre. The theatre provides for an ordinary lecture audience of 100 compactly arranged, and in which, on rare occasions, 400 or 500 persons could be comfortably accommodated. This has been accomplished by the provision of a deep gallery, which is supported without pillars. The space beneath the upper tiers of seats has been utilised to provide three dark rooms. One of these is for the spectrophotometer, polarimeter, and spectroscope, for the use of those engaged in chemical work. The other two rooms are intended for galvanometric and photographic work. In the basement are also two classrooms, each of which will accommodate about 40 students. The rest of this floor is occupied by store-rooms and by the heating-chamber. On the main floor are the laboratories and preparation room for physiological and pathological chemistry. The students' laboratory is 70ft. by 30ft., and is fitted with transverse chemical benches with sinks and stands for reagents. On the same floor are three small rooms, specially fitted up as a balance-room, a calorimeter-room, and a gas-room. On the top floor the whole of the front of the building is devoted to the laboratory and preparation room for normal and morbid histology. Here the preparation room is smaller than that in the chemical department, and the students' laboratory is 80ft. long. On this floor there is also a small workshop, to be fitted with lathe and carpenter's bench, adjoining the histology room. These buildings have entailed an expense of about £12,000. A further sum of £35,000 will be required for the completion of the scheme.

The town council of Launceston discussed at great length last week the question of the site for the Passmore Edwards Free Library. The choice lay between Church-street and Westgate, and by a majority of one the former situation was finally chosen.

Dr. Ernest Hugh Snell has been selected by the sanitary committee of the Coventry Corporation, from 41 candidates, for the post of medical officer of health for the city. Dr. Snell was the special medical officer appointed by the London County council in connection with the Blackwall Tunnel.

### COMPETITIONS.

**ENNISKILLEN.**—Mr. Thomas Drew, of Dublin, president of the Institute of Architects of Ireland, made his award on Thursday night in last week in the competition for the new town hall. He stated that he had never before known a competition carried through with such perfect fairness, but not one of the designs could be carried out for the £7,500 limit required by the commissioners. The plans, 19 in number, were known by mottoes, and the award having been adopted, the seals of the envelopes were broken, and it was found that the successful competitors were: First premium (£50), "Black and White" (Messrs. A. Scott and Sons, Drogheda); second premium (£20), "Ulster" (Mr. W. R. Perry, 35, Dame-street, Dublin); third premium (£10), "Axiom" (Mr. T. Rowe, 1, Lombard-street, Belfast). The first premiated design has a tower rising from the angle on the diamond. The chief entrance is in Town Hall-street, with another principal entrance in Water-street. There is a spacious corridor running from the main entrance in Town Hall-street, through to the back of the building, and this is bisected by another corridor running from the Water-street entrance directly up to the grand staircase. In the provision of exits the plan, Mr. Drew pointed out, is very superior to all the others. Mr. Drew reported: "I have placed 'Black and White' first, and wish to distinguish it apart from all others as a design of pre-eminent merit. It is planned in a skilful and masterly way, such as no other design approaches, and with some modifications in detail would be a nearly perfect plan for the purpose." The Commissioners have adopted the plan, and have instructed the author and Mr. Drew to confer with them with a view to carrying out the work.

**GLOUCESTER.**—At Tuesday's meeting of the city council the question of providing a site for a free library, to be erected by public subscription in commemoration of the Queen's reign, was under discussion. A committee recommended the appropriation of the Spa Pump-room site, but this did not meet with approval, and eventually it was determined to find a more central site, if possible, in Brunswick-road, the site of the city weights and measures office being named. It was decided to invite architects to send in plans when the site is finally selected, the cost of the building and fittings not to exceed £5,000.

**GUERNSEY.**—The competition of the States' Halls has been settled since we mentioned the matter last week. The premium of £100 was awarded by the referee, Mr. Aston Webb, to the author of the design with the motto "V. R.," Mr. R. Frank Atkinson, architect, Athenæum, Liverpool, and that of £50 to the author of the design with the motto "Saumarez," Mr. A. J. Rowley, architect, 132, High-street, Oxford. After the States of Guernsey have approved and sanctioned these awards, we are promised the loan of the drawings for illustration.

**DARWEN.**—The Jubilee Committee, of whom Mr. Charles Costeker, the town clerk of Darwen, is hon. secretary, recently decided to invite competitive designs for a tower, only 50ft. in height, to be erected just above Red Delph, on the highest point of Darwen Moors, and offered premiums of £5, £2 10s., and £1 1s., for the three selected designs, all of which were to become their property. It was announced that the competition was limited to inhabitants of the borough, and further, as "one of the intentions of the committee in arranging the competition is to afford an opportunity for the encouragement of the students of the technical and other schools in design and construction, professional architects in practice on their own account will be debarred from entering the competition, but the *bona-fide* designs of their assistants or pupils will be accepted." The idea took, and money came in so much more freely than was at first anticipated, that it was decided to raise the height of the tower to 100ft., and to increase the outlay from an estimated £600 to no less than £1,250. Stone for the edifice was given by the lord of the manor from Red Delph quarry, free of cost, as well as a donation of £200, and Mr. Graham Fish has further promised to give the Corporation a telescope, valued at £100, to be placed in the tower, which will be fitted up as an observatory. On Thursday night in last week a meeting of the sub-committee was held, when Mr. J. Herbert Stones, F.R.I.B.A., of Blackburn, who had been appointed as assessor to award the prizes for the best design of a tower,

sent in his report. He stated that he examined the series of designs hung for inspection in the council chamber. The designs were twenty in number, and included one exceedingly well drawn, several fair in draughtsmanship, and a majority betraying the absence of the power of properly representing the various authors' desires. After comparison, he concluded that the choice of the three designs deserving premiation lay amongst the following: "Strong and Durable," "Ozone," "Lancastrian," "Darwen," "Stability," and "Utility"; but in his opinion none could be carried out without some excess of cost beyond that named in the conditions. He recommended that the first premium be awarded to "Darwen," the second to "Utility," and the third to "Stability," the last-named being, as a drawing, by far the best one submitted, although the planning was not equal to the elevation. Mr. Stones added that he should be happy to make a donation to the commemoration fund of the amount of his charges as assessor. The report was adopted, and it was found on opening the envelopes that "Darwen" is by Mr. David Ellison, of the borough surveyor's office; "Utility," by Mr. J. W. Holden (Messrs. Sames and Green); and "Stability" by Mr. F. J. McColl (Mr. J. B. Thornley).

**WANDSWORTH AND CLAPHAM UNION.**—The nurses' home competition has been settled this week with the following results:—The winner of the first premium (50 guineas) was the design bearing the motto "Nightingale," by Messrs. Lansdell and Harrison, of 12, Compton-terrace, Highbury, N. The winner of the second premium (20 guineas) was the design bearing the motto "Florence Nightingale," by Mr. F. T. W. Goldsmith, of 1, Verulam Buildings, Gray's Inn, W.C. The winner of the third premium (10 guineas) was the design bearing the motto "Victoria," by Messrs. Gould Wills and Bulman, of "Inglebrook," 48, Sister's-avenue, Clapham-common, S.W. The number of designs sent in was 16. The plans of the selected design are now before the Local Government Board. Messrs. Lansdell and Harrison's designs for the reconstruction of Chelsea Workhouse at a cost of about £68,000 have been approved by the guardians.

### CHIPS.

Mrs. Creighton, wife of the Bishop of London, will lay the foundation stone of the new Church of St. Peter, Hornsey, on Saturday, July 3. The church, of which Mr. James Brooks is the architect, was illustrated by a perspective and plan in our issue of the 14th inst.

The infirmary at Stockport is about to be extended, from plans by Messrs. Woodhouse and Willoughby, of Manchester, by the addition of a north wing, at an estimated cost of about £6,000.

On Friday evening, at the Marine Hotel, Llandudno, a banquet was held to celebrate the granting of a provisional order by the Board of Trade for the erection of the Victoria Pier. The toast of the evening was acknowledged by Mr. J. P. Harker, the engineer, who gave a description of the contemplated works.

The London (Clare Market, Strand) Provisional Order Bill was read a third time in the House of Lords on Monday.

Dr. Bilsborrow, Bishop of Salford, opened on Sunday a new Roman Catholic church at Colne. The building, which is at present only partially complete, has cost £2,500.

A large number of persons on Saturday visited the works of the new Roman Catholic Cathedral now in course of erection at Westminster from designs by Mr. J. F. Bentley, and were conducted round by Mr. Oates, private secretary to Cardinal Vaughan. The construction is making satisfactory progress, and will, it is hoped, be completed within two years. The foundations have been finished (at a cost of £15,000), and the granite façade is gradually mounting. The funds in hand will, it is expected, be absorbed by another year's work.

A new cross, with square gabled head and octangular shaft of solid Portland stone, was last week erected in Hartland Church on the old foundation of the ancient churchyard cross. The cross, including the three steps and the base, is 15ft. in height, and was carved by Messrs. Farmer and Brindley, who took for their base of operations, "The History of Hartland: Its Church and Abbey," by the Rev. T. H. Chope, vicar of Hartland. The subjects chosen for the front panel are the Crucifixion and the figures of St. John and St. Mary standing at the foot of the cross. The first step rests on the original base of the altar slab on a new block of cement concrete.



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ILLUSTRATIONS.

"THE ADORATION," BY N. H. J. WESTLAKE.—ST. MARK'S CHURCH, HARROGATE.—SECOND PREMATED DESIGN FOR THE NEW TOWN HALL, GOVAN.—THE PASSMORE EDWARDS CENTRAL TECHNICAL SCHOOL, TRURO.—DESIGN FOR A DISTRICT COUNCIL HALL.—NEW PREMISES FOR MESSRS. PHILLIPS AND TRIBE, HOSIER LANE, E.C.—PROVINCIAL FURNITURE OF THE STUART PERIOD.

Our Illustrations.

"THE ADORATION": THE CENTRAL PANEL OF A TRIPTYCH.

THIS painting, from the Arts and Crafts recent exhibition, has been designed and executed by Mr. N. H. J. Westlake, F.S.A., assisted by Teresa Westlake. The richness and elegance of the design can only be realised, of course, in the original; but the relative force and general arrangement of the composition is well rendered in the photograph which we have to-day reproduced. The artist has realised the scene in a thoroughly decorative and suitably dignified way, ecclesiastically considered, with due regard to its setting and surroundings.

ST. MARK'S, HARROGATE.

THIS church, illustrated to-day from the architect's drawing now on view at the Royal Academy, has been designed for a part of Harrogate which is rapidly extending. It is on the Leeds-road, and will occupy an excellent site on high ground, visible from most parts of the town and surrounding country. The church will hold 800, and, without the tower, is estimated to cost about £12,000. The style is Flowing Decorated. A good local stone of a red tone will be used, and it is hoped that the walls externally will be faced with ashlar. A leading feature will be the large clerestory from which most of the light will be obtained. The architect is Mr. J. Oldrid Scott.

SECOND PREMATED DESIGN FOR GOVAN TOWN HALLS.

IN this design, for which the second premium was awarded to Messrs. Dykes and Robertson, of Glasgow, the determination as regards plan has been a rigid adherence to the printed conditions of competition, and as regards the exterior to produce a building at once dignified and expressive of its purpose and importance. Thus absolute intercommunication betwixt all parts of the building is maintained, together with the desiderated grand staircase, for which an obvious *raison d'être* is sought, through placing directly in touch with it the principal hall and the more important official departments. On the ground floor, accommodation, at the main entrance from Govan-road, is provided for the burgh officer or janitor, where, in addition to the exercise of effective general supervision, he could have control of the telephonic switch-board for placing the several official departments in instant communication. The provost's rooms are placed to front Govan-road and Summer-ton-road, while the town clerk's department occupies the opposite corresponding corner at Merryland-street. Ready access from these departments and from the council chamber and committee-rooms (which might occasionally be

used as reception-rooms) is provided to the platform of principal hall by way of two stairs leading up to it or otherwise, as, when on special occasions it became desirable to use the grand staircase as an approach to both halls, the platform would be conveniently reached by flights of steps communicating therewith from the first-floor landing of grand staircase. This arrangement would admit equally of communication betwixt the platform areas and balconies of the two halls in the event of both being used conjointly. The large hall is placed in the centre of the plan, the entrance to the best seats in area and galleries being from the main entrance-hall and grand staircase, while the platform is equally served alike from ground and first-floor level. Two entrances, one from each side-street, serve the back portions of main hall, the corridors at these entrances affording shelter for an assembled crowd awaiting the opening of the inner doors and preventing obstruction of the pavements. The burgh treasurer's department is in Summer-ton-road, with an entrance special to itself. The department of weights and measures is entered from Merryland-street, and has the operative portion kept a little apart to prevent disturbance from noises. On the first floor are placed the lesser hall, with appurtenances, the burgh surveyor's and sanitary inspector's departments, and a dwelling-house for the burgh officer. The area under dome of grand staircase is well suited as a promenade on occasions. Three spare rooms on east front are available for such expansion or future department as the development of the burgh may render necessary. Lifts, convenient to the entrances to the several departments, are provided in connection with corridors running continuously round the large hall. Emergency exits are available from galleries in connection with each of the side staircases. The galleries are constructed on the cantilever principle, and have no obstructing columns. Third floor.—So much being asked for on the ground floor, only the cleansing inspector's department, the kitchen and scullery and the gallery of smaller hall are available, according to this plan, for a third story. The heating is by low-pressure steam pipes in ducts, fresh air being introduced to these ducts at suitable points, and sent heated into the large hall on the walls near the level of area and gallery floors and in the council chamber and smaller hall, coils would be placed in the window bossings where heated fresh air would be admitted. Radiators would be placed near the entrances, at the staircases and in the corridors, while the smaller rooms generally would be heated by ordinary open fires. The extraction of vitiated air would be effected at or near the ceilings, and be assisted by electrically-propelled fans, which, when the heating was unnecessary and not in operation, would still serve to induce the necessary change of air.

THE CENTRAL TECHNICAL SCHOOLS FOR CORNWALL.

THE memorial stone of the Central Technical Schools for Cornwall, forming a memorial to the late Sir Charles Lemon, was laid on Tuesday by Mr. John Passmore Edwards, the donor of the buildings. The site adjoins the Free Library, also given by Mr. Passmore Edwards, and Mr. Silvanus Trevail, of Truro, is the architect of both buildings. When the schools are erected there will be an imposing range of façade extending from Pydar-street to St Mary's Wesleyan Chapel, with the chief elevation fronting to the Royal Institution of Cornwall. The schools will be in the Tudor Renaissance style, harmonising with the library, although not quite in the same style. The inscription on the existing building is "Passmore Edwards Free Library," and this will be extended along the main frieze, which will be continuous in the whole length, by the addition of "and Central Technical Schools for Cornwall." The walls will have a granite base, corresponding with the library, Bath stone dressings, and Plymouth limestone filling, and there will be mullioned transomed windows towards the front. Over the chief pediment will be placed the arms of the city of Truro. On either side will be the arms of the county and of the late Sir Charles Lemon. A *flèche* on the roof will ventilate the building. The woodwork of the interior will consist of varnished pitch-pine, as in the library. A perspective drawing of the building by Mr. Trevail is hung in one of the best places in the present Royal Academy exhibition. The length of the new building will be about three times that of the frontage of the existing library. There will be a central entrance with porch and vestibule 10ft. wide, opening into

a 6ft. corridor running right and left. On the ground floor to the right will be a physical laboratory measuring 20ft. by 14ft. 6in.; a photographic dark-room; at the end of the corridor a general chemical laboratory, 37ft. by 20ft., fitted at first with benches for 20 students; a metallurgical laboratory, 20ft. square; a general store-room, balance-room, and a managers's room. To the left of the main hall will be a general lecture-room, 30ft. by 20ft. Immediately opposite will be a science-room, 21ft. by 20ft., and a class-room, fitted up as a kitchen, for instruction in cooking, nursing, and dress-making, with scullery and stores opening therefrom. The first floor will contain seven classrooms for scientific instruction, ranging in dimensions from 29ft. by 22, in the case of the mechanical drawing school, to 20ft. square, and a secretary's room. Residential provision for the caretaker and sanitary conveniences will also be placed on the first floor. The story above will be devoted entirely to the purposes of art, and will include a figure and cast-room, 30ft. by 20ft., advanced painting-room, 20ft. square; elementary art-room, 29ft. by 22ft.; modelling-room, 21ft. by 20ft.; art-master's room, 21ft. by 20ft.; and art gallery and general examination-room, 50ft. by 20ft. The rooms will be arranged so as to work *en suite*. All the chief lights will be to the north and ranged high. At this level the free library will be extended by the addition of a floor, which will be effected by lifting the roof and adding to the walling. This addition will provide a residence for the librarian and extra storage capacity.

"BUILDING NEWS" DESIGNING CLUB: A DISTRICT COUNCIL HALL.

(For description and awards see p. 768.)

NEW PREMISES, HOSIER LANE, E.C.

THESE buildings have been erected by Messrs. Phillips and Tribe, and are to be used as warehouses, bacon-drying stoves, and general stores. The bacon-drying stoves in rear are capable of drying 1,000 sides of bacon, besides about 400 hams, at one operation. The inside boards of roof are pitched, to prevent smoke from escaping through joints. A galvanised iron tray is suspended in roof by chains to prevent the tar which accumulates in the flues from falling on the bacon. Oak sawdust is the fuel used, which is spread over the floor about 2in. deep. Mr. Thos. Wallis, of York Buildings, Adelphi, was the architect. The contractors were Messrs. Heinemann and Brown, of Balham. The constructional ironwork was carried out by Messrs. Dennett and Ingle. Cost of building £3,370.

PROVINCIAL FURNITURE OF THE STUART PERIOD.

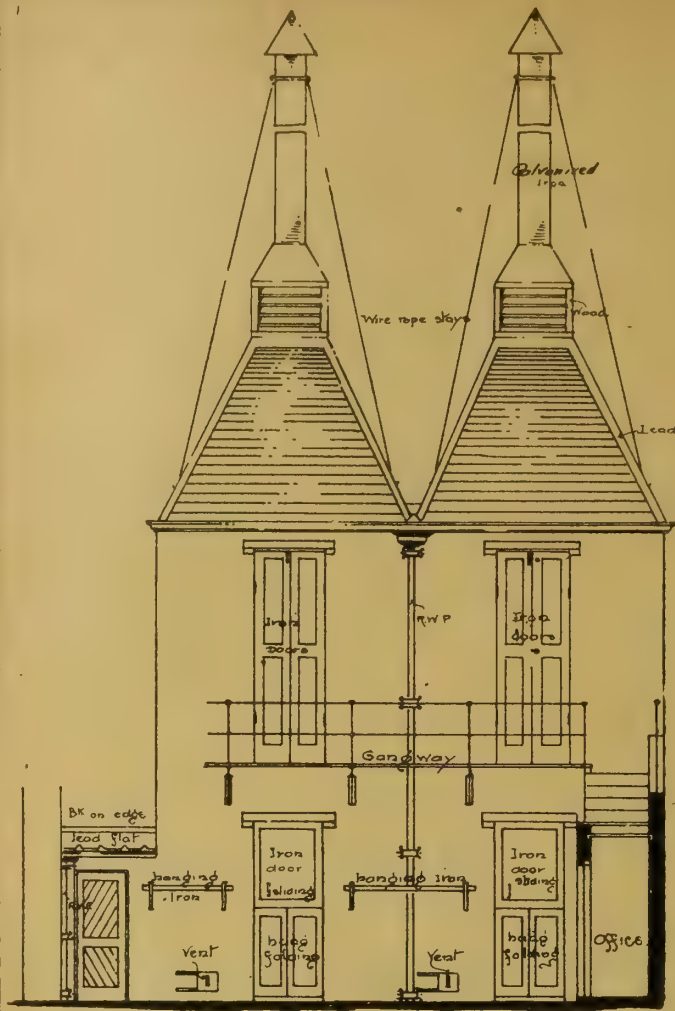
THE little Court Cupboard, which holds the central position on our sheet of sketches, stands only 3ft. 6½in. high, is 2ft. 5in. wide, and 1ft. 5in. deep. It is in oak, carved in a typical manner, and has been slightly restored. The Derbyshire single Chair possesses the effective arched work common to that and the adjoining county of Yorkshire, in the 17th century. The back is high for the size of the chair, imparting a quaint appearance. The total height of chair is 3ft. 9in. The solid-back chair, belonging to much the same period, is very curiously carved in the back. Its total height is only 3ft. 2in. They are all at the South Kensington Museum. The cabinet was purchased for £15, and the chairs for £5 each.

The veteran landscape painter M. Harpignies has received the medal of honour at the Champs Elysées Salon for the two canvases, Nos. 817 and 818, "Solitude" and "Bords du Rhone."

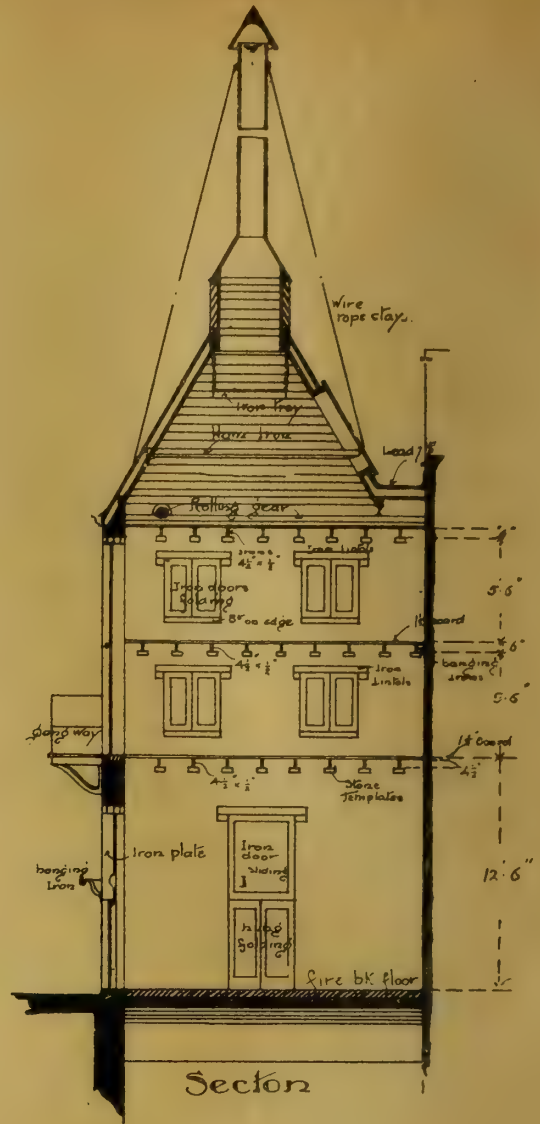
The trustees of the late Mr. James Holden, of Marland, Rochdale, have presented to the Rochdale Infirmary, in commemoration of the Diamond Jubilee, £18,000. The intention of the trustees is to endow a wing lately added to the building, which is to bear the name of the Holden wing. It will contain twelve beds for men, the cost of endowing which is £1,000 each, and twelve cots for children at £500 each.

A *rearedos* of Caen stone and alabaster has just been erected in Finsall Church, near Bromsgrove, to the memory of the late Rev. J. H. Bainbridge. It consists of three arcades with gable tops supported by pillars of green marble. The centre panel has a large figure of our Saviour as the "Good Shepherd," and the two side ones the "Alpha and Omega," with floriated decoration. The work has been carried out by Messrs. Jones and Willis, 79, Edmund-street, Birmingham.



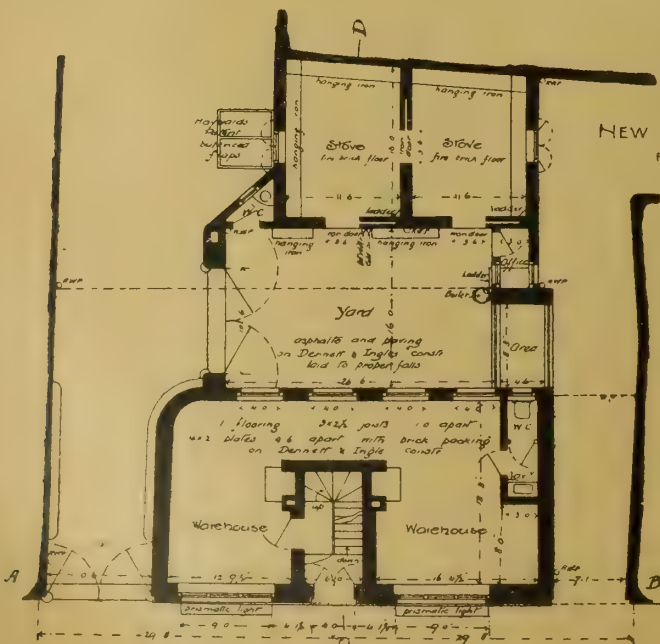


Front Elevation



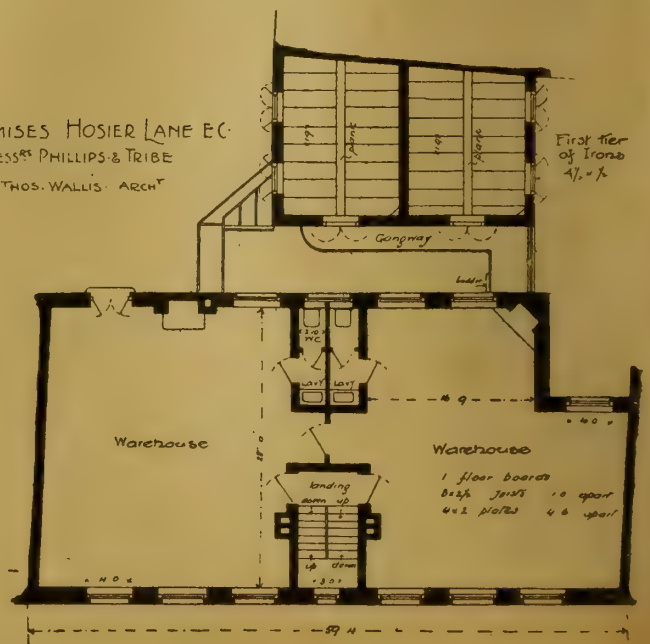
Section

BACON DRYING STOVES.



Ground Floor Plan

NEW PREMISES HOSIER LANE EC.  
FOR MESSRS PHILLIPS & TRIBE  
THOS. WALLIS ARCHT

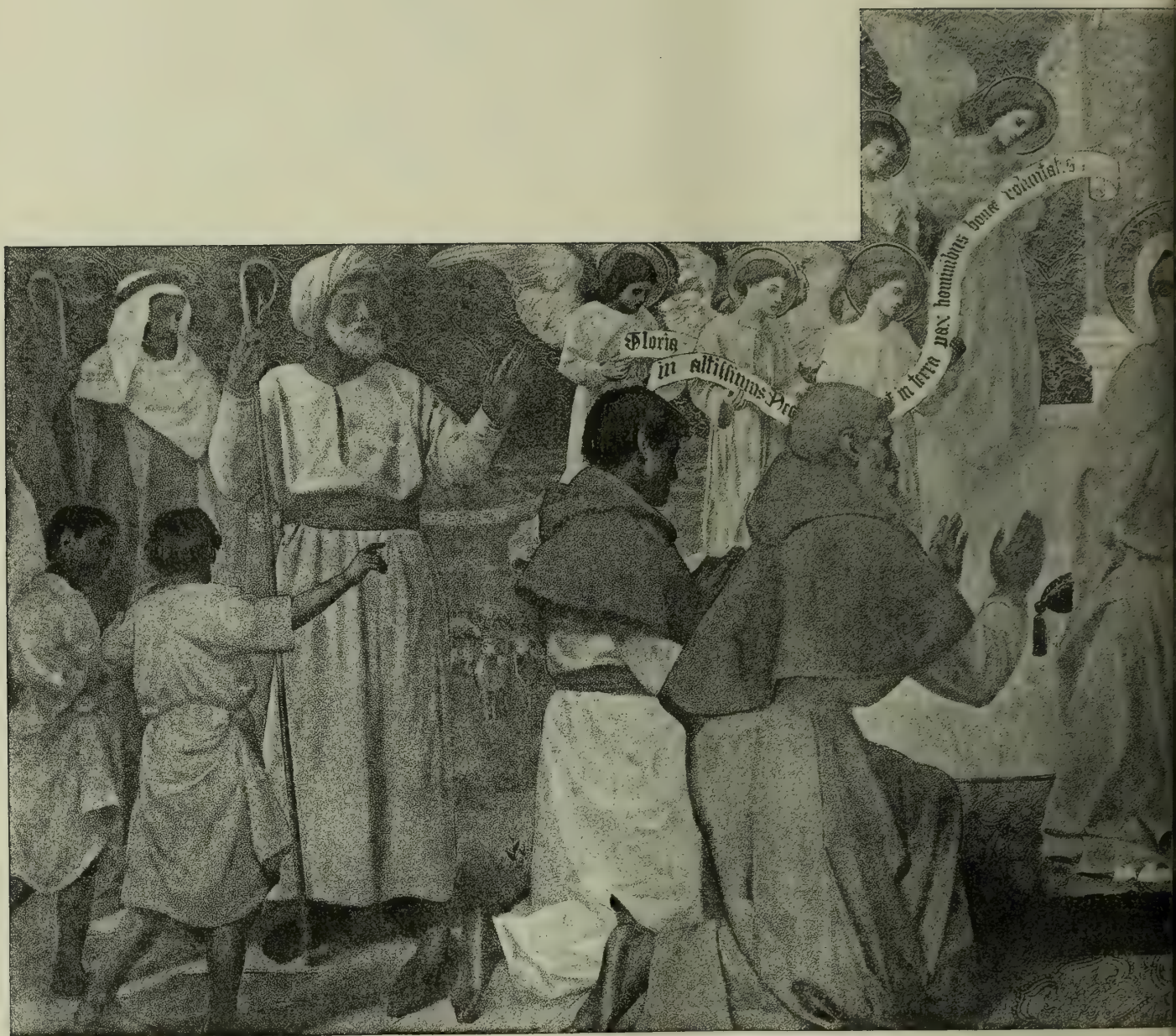


First Floor Plan







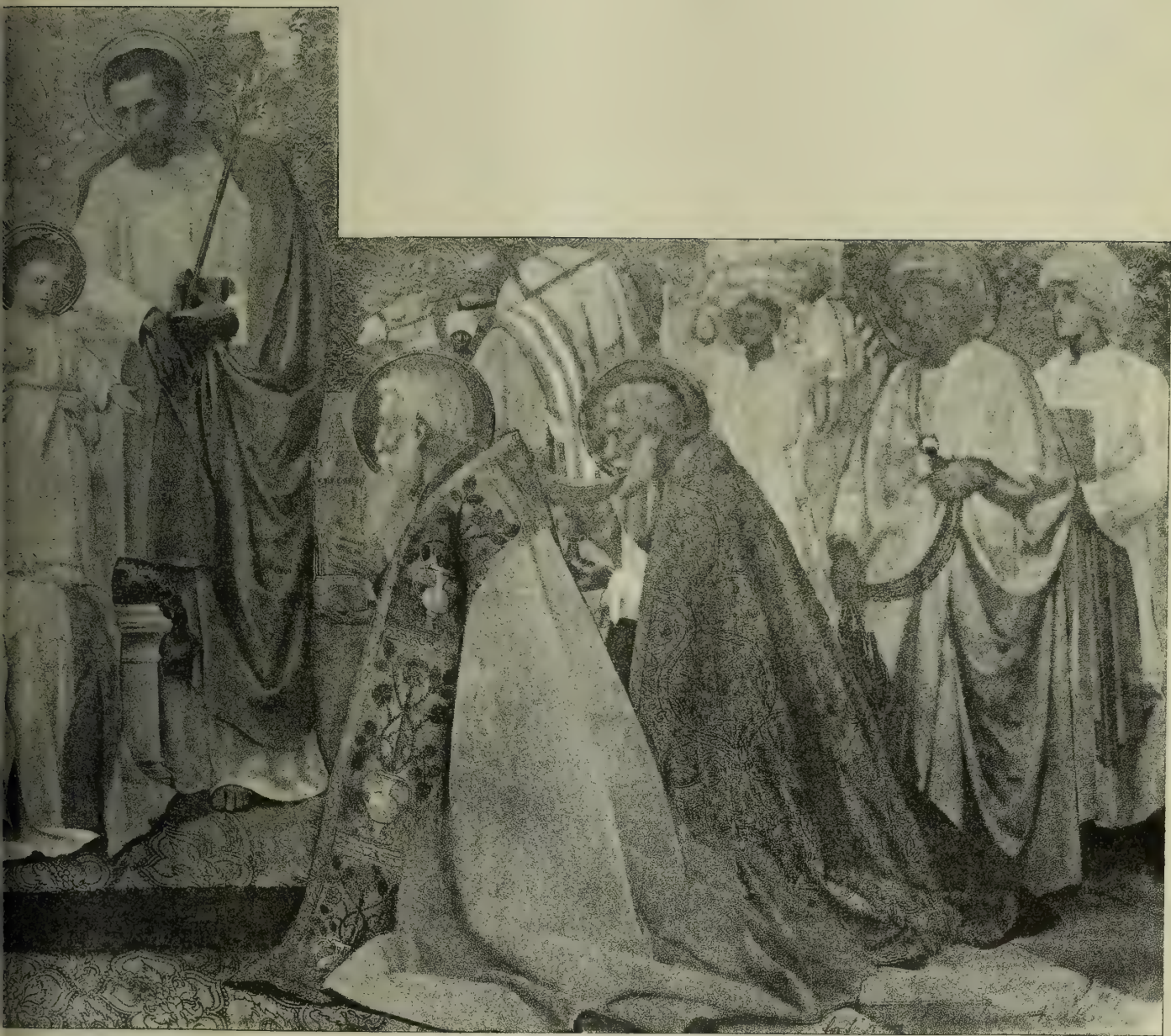


FROM THE ARTS & CRAFTS EXHIBITION

"THE ADORATION" · DECORATION FOR THE



S. MAY 28, 1897.



"PHOTO-TINT," by James Akerman 6 Queen Square, London, W.C.

TRAL PANEL OF TRIPTYCH · BY N.H.J. WESTLAKE ·









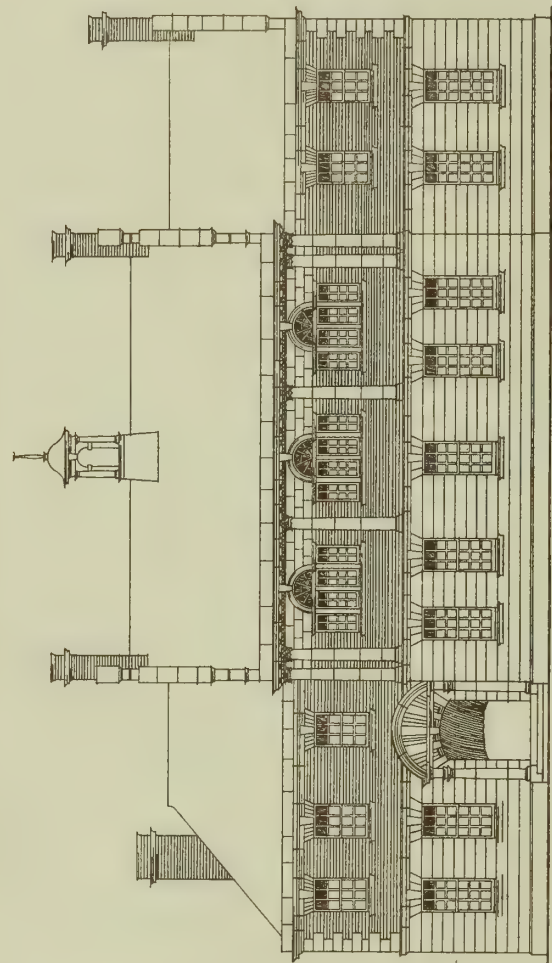


APRIL 1897

THE BUILDING  
NEWS DESIGN-  
ING CLUB. A  
DISTRICT COUNCIL  
HALL

BY THE  
DINGO

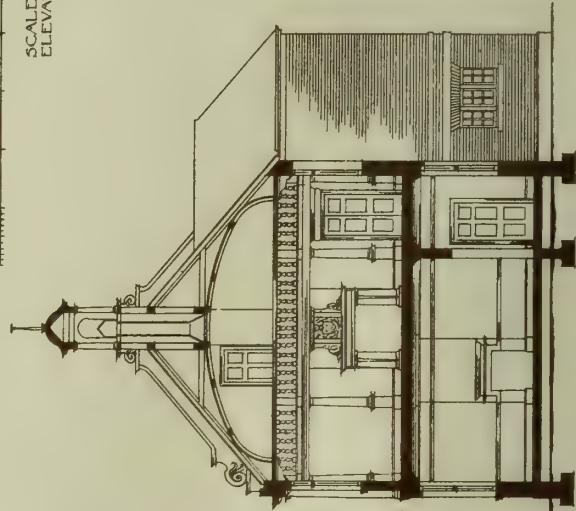
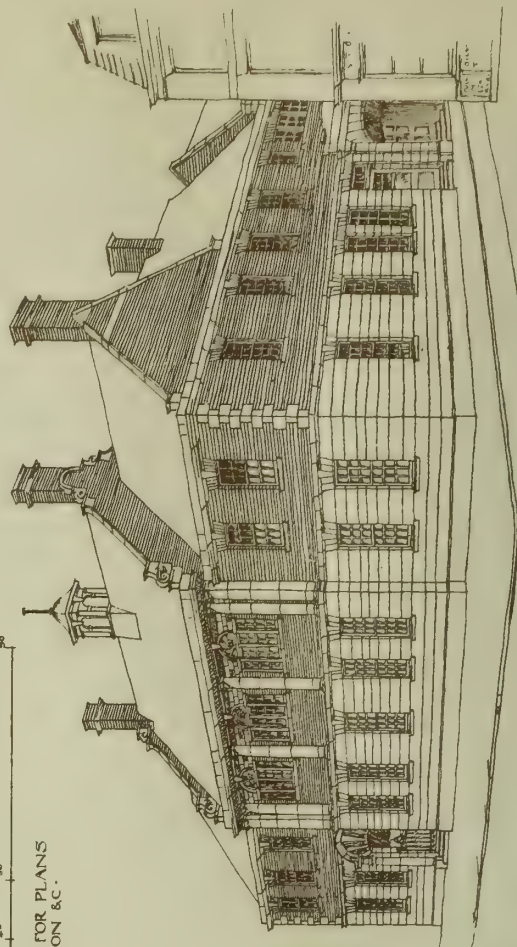
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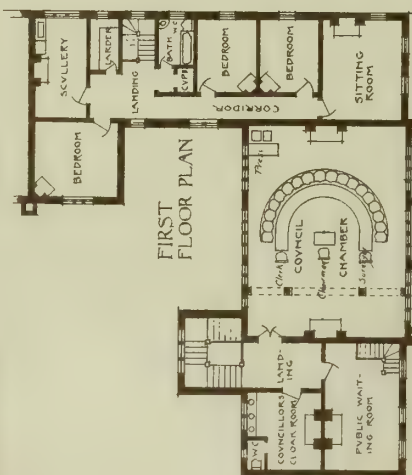
ELEVATION



SCALES FOR PLANS  
ELEVATION & C.



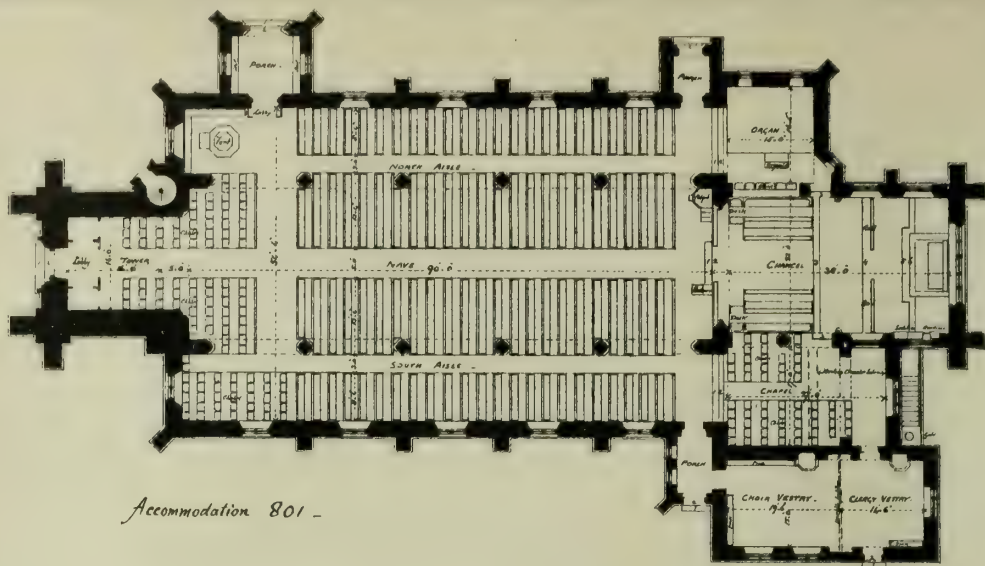
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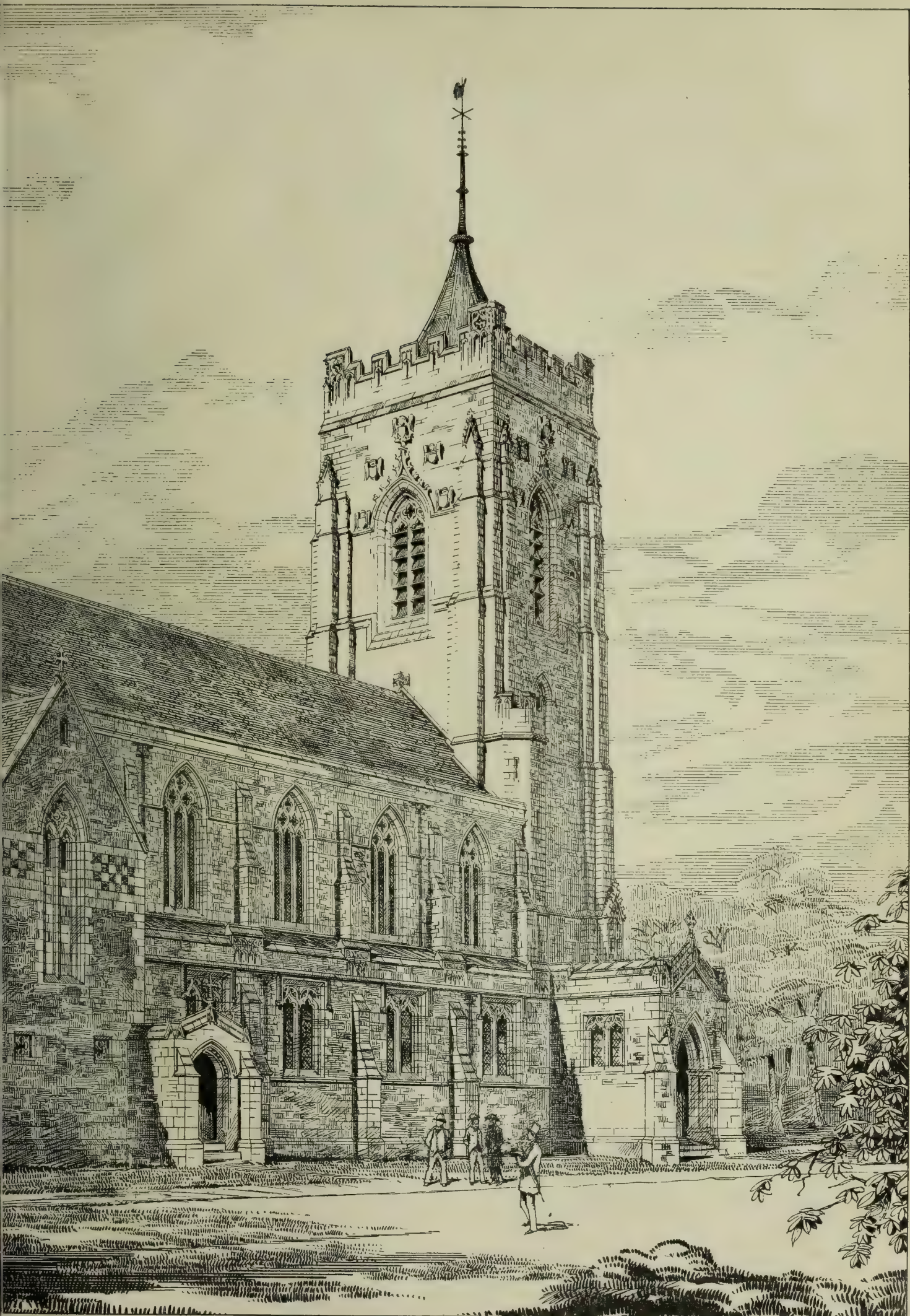


Accommodation 801 -

Feet 0 5 10 20 30 40 50 Feet.













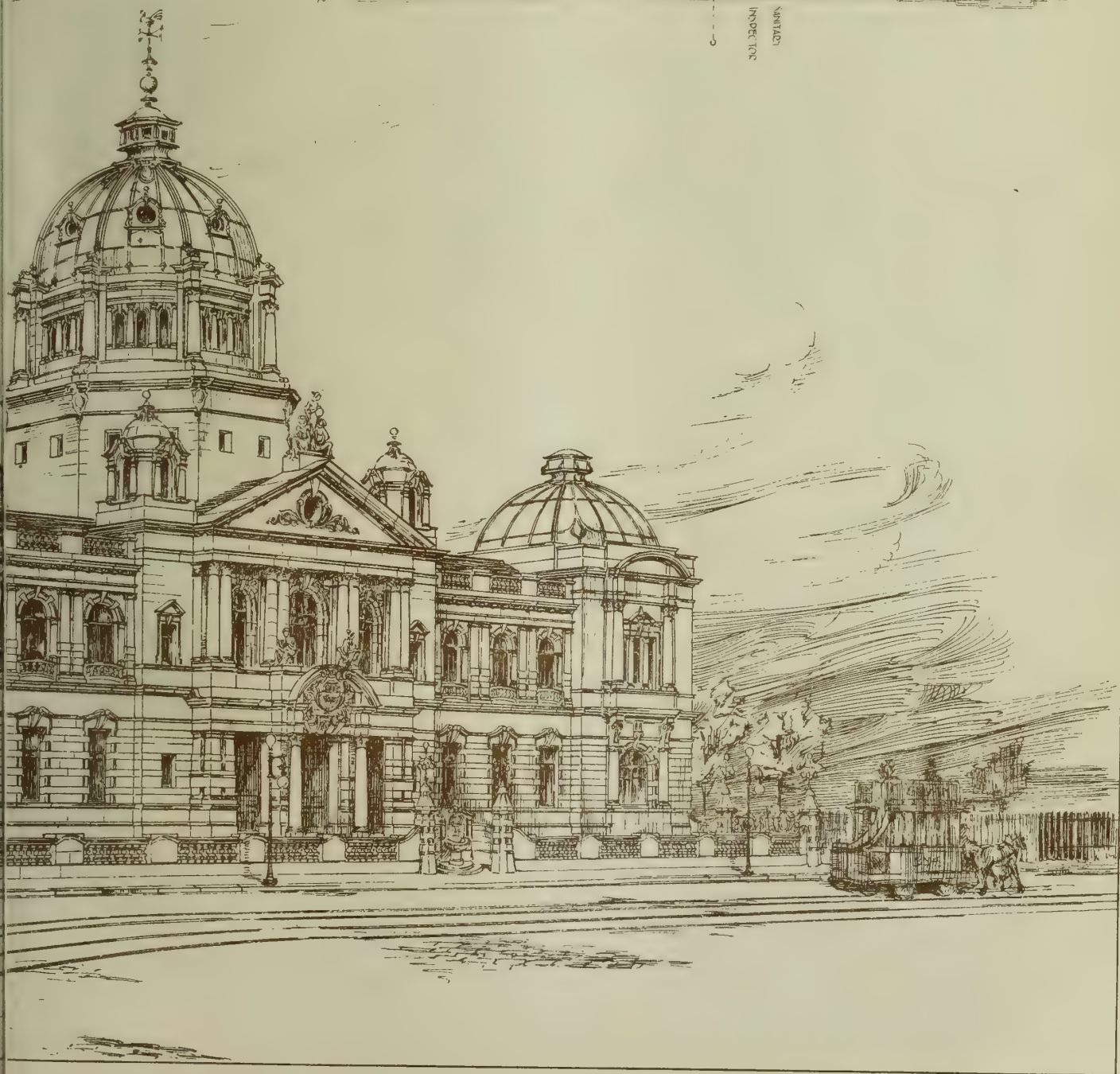
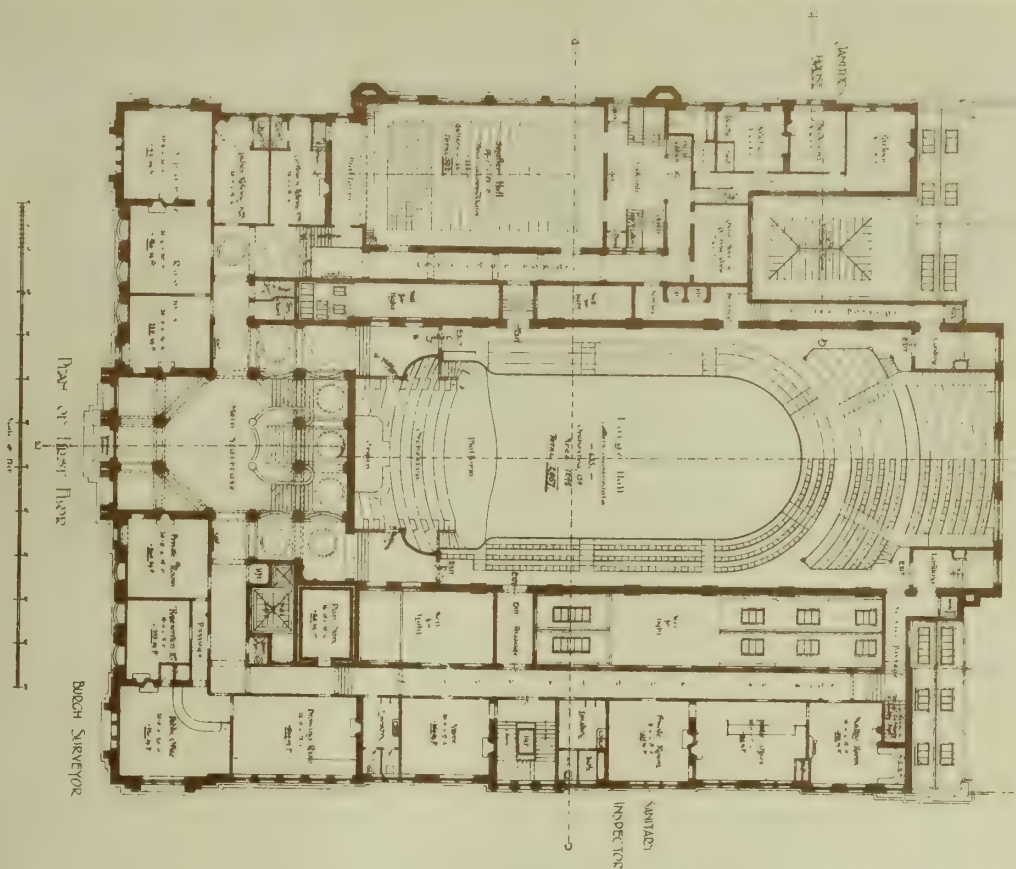




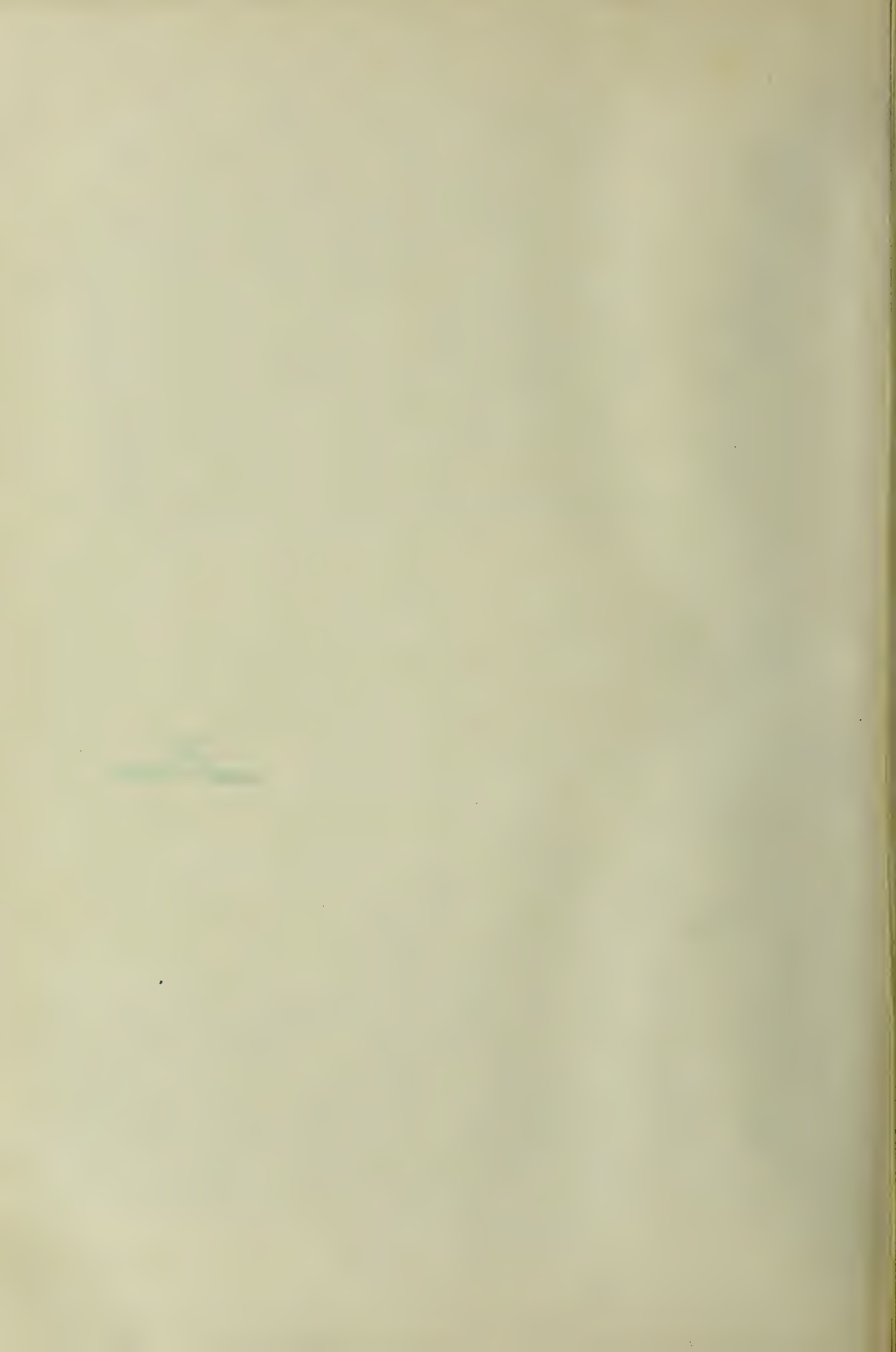




ND PREMIATED DESIGN.  
N, ARCHITECTS.



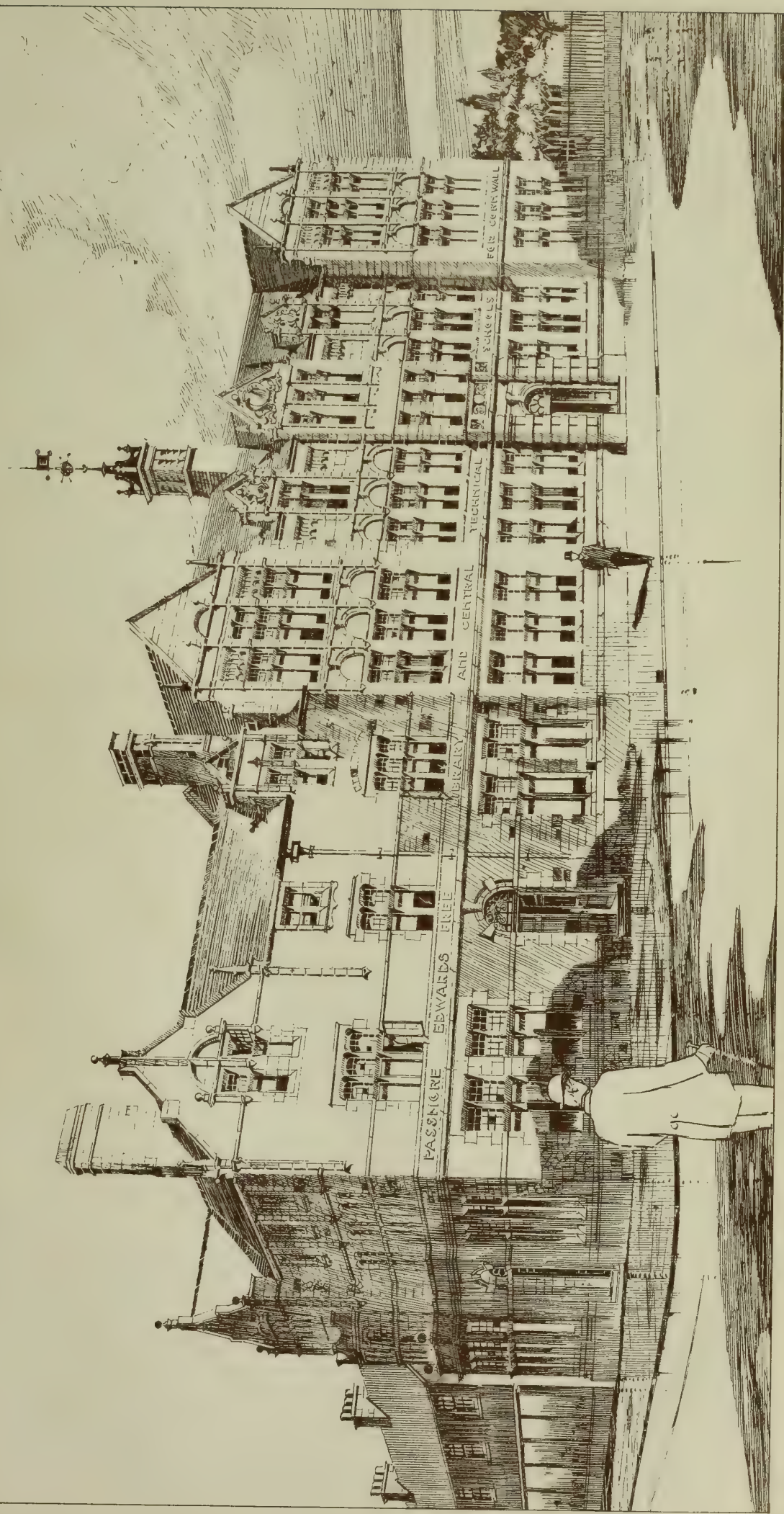






"CORNWALL CENTRAL TECHNICAL SCHOOLS, TRURO."  
(ERECTED BY MR J PASSMORE EDWARDS.)

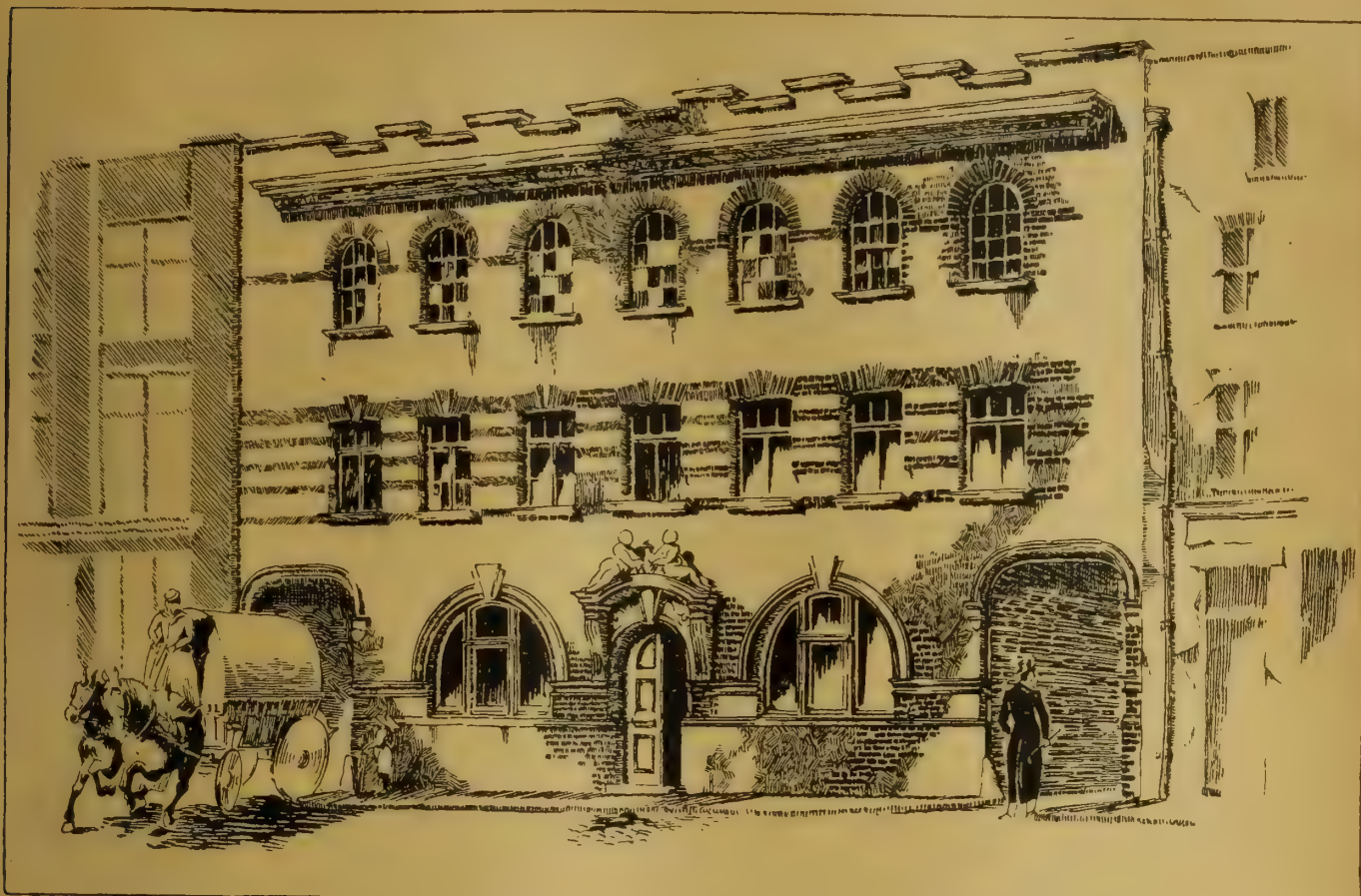
SILVANUS TREVAIL FRIBA.  
ARCHITECT



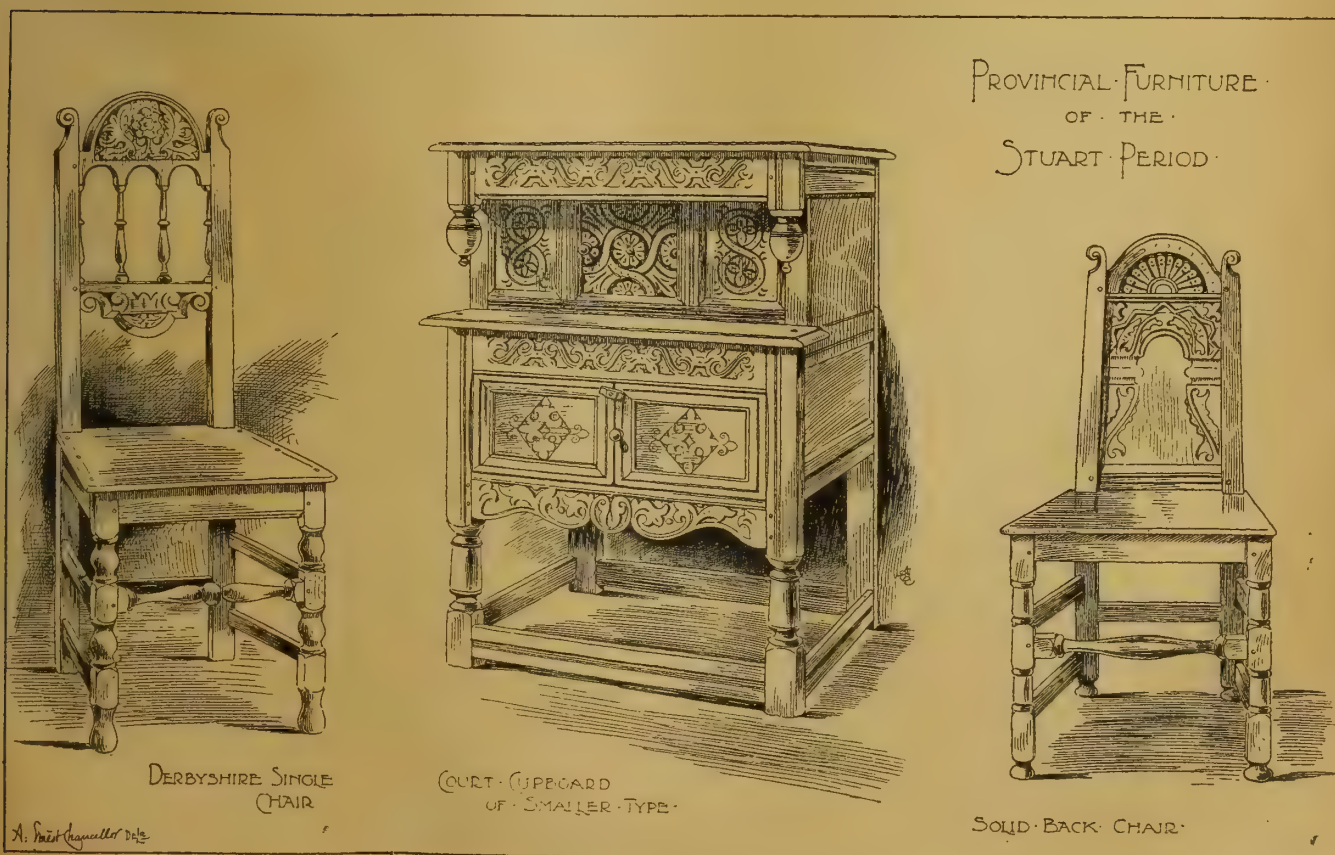








NEW PREMISES FOR MESSRS. PHILLIPS AND TRIBE, HOSIER LANE, E.C.

THOS. WALLIS, *Architect.*



## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**ARCHITECTURAL ASSOCIATION OF IRELAND.**—The closing meeting of this association was held in the Grosvenor Hotel, Dublin, the president, Mr. R. Godfield Orpen, in the chair. The meeting was held for the purpose of receiving an interim report from the committee, and arranging business details. The report read dealt with the work of the winter term of this, the first, session, and was of a very satisfactory character. Statements were made dealing with the progress of the various classes established, and with the work of the association as a whole, which has now a membership of over 100, eight new members having recently been elected. A vote of thanks was passed to the council of the Royal Hibernian Academy for their kindness in granting the use of the Academy house for the annual *conversazione*. It is intended that the work of the association shall not entirely lapse during the summer months, as a sketching class will be formed for the purpose of visiting buildings and places of architectural interest in and around Dublin.

**A SOCIETY OF ORDAINED SURVEYORS FOR EDINBURGH.**—A meeting of ordained surveyors of Edinburgh was held on Friday night in Dowell's Rooms—Mr. P. Laurence in the chair—when the question of forming an institute or corporate body of the profession was considered. After full discussion, it was decided to take steps to form such a society, and the following committee was appointed for this purpose—viz., Messrs. P. Laurence, A. Laurie, T. Fairbairn, A. K. Smith, and W. Ormiston, with Mr. F. H. Lightbody as secretary.

**BRIGHTON MASTER BUILDERS' ASSOCIATION.**—The annual dinner of this association was held on Thursday night in last week at the Clarence Rooms, Hotel Métropole, Brighton. Alderman Botting, J.P., chairman of the association, presided, supported at the head table by A'derman Davey, J.P., Councillor Wilson, Mr. J. K. Nye, Mr. Howard F. Gates, Mr. G. S. Godfree, Mr. Sadler, and Councillor Carden. The vice-chairs were occupied by Mr. C. Lynn, Mr. T. Garnett, and Mr. F. Parsons. Those present also included Councillor Brown, Mr. Frank Botting, Mr. Herbert Botting, F.C.O., Mr. Barnes, Mr. A. Emary (secretary), Mr. Pierce, Mr. Winter, and Mr. Willner. Mr. J. K. Nye proposed "The Mayor and Corporation." Alderman Davey acknowledged the toast. Mr. G. S. Godfree proposed "The Brighton Association of Master Builders." The chairman, in responding, said the association was not formed for the purpose of fighting the workmen of the town. On the contrary, he believed no body of masters ever were on better terms with their workmen than the master builders of Brighton. He thought it possible they might have a repetition of strikes in the country, because the union leaders watched for prosperity and regarded the time when workshops were full of work as the proper one for a strike. The master builders must, therefore, be prepared, for it was where they were not ready that strikes were declared, and if they kept together as they had done during the past four years he did not think there would be any trouble in Brighton. Referring to the new Employers' Liability Bill, he hoped the Association in London, of which theirs was a branch, would be very firm and determined in resisting the extension of the Bill to the building trade. The Bill was now restricted to what were called dangerous trades; but in committee a very strong attempt would be made to make the building trade also responsible for all accidents. Where there was carelessness on the part of the master builder he ought to pay, for every precaution should be taken for the safety of the men, and in Brighton generally that was done, but an attempt would doubtless be made to saddle the employer with all responsibility, however much the workman was to blame for carelessness. Councillor Wilson proposed "The Visitors," for whom Mr. Howard Gates responded. Mr. Parsons proposed "The Chairman." Alderman Botting replied. Councillor Holloway proposed "The Vice-Chairmen." Mr. Lynn, Mr. Garret, and Mr. Parsons responded.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The Edinburgh Architectural Association visited on Saturday afternoon The Binns and Midhope, Linlithgowshire, by permission of Mr. J. Cornwall Dalryell and the Earl of Hopetoun. Mr. Thomas Ross, F.S.A. Scot., in describing The

Binns, said that it occupied the summit of a low ridge of hills to the south of Blackness Castle. On plan it formed three sides of a square, the east wing being the oldest part, and probably dating from the 16th century, and the north and west wings from the 17th century. One, at any rate, of the fine plaster ceilings seemed to be by the same hand that executed those at Moray House, Edinburgh. The Dalryells of The Binns were descended from the Dalryells of Dalryell, and they acquired The Binns towards the end of the 16th century. General Dalryell took a most prominent part in the events of the 17th century, dying a very old man in 1685 in spite of a large reward being offered for him, dead or alive. Mr. Ross, in his description of Midhope, said it was a lofty mansion-house situated in a picturesque dell, and quite hidden from view till one was almost within call of it. Oblong on plan, it was erected at three distinct periods. The whole basement was vaulted, and a small newel stair in the older part and a fine oak stair in the later gave access to the upper floors. Alexander Drummond, second son of Alexander Drummond of Earnock, was the first laird of Midhope, and in the beginning of the 17th century the property passed into the hands of the Livingstone family, who probably built the eastern parts. On the motion of Dr. Rowand Anderson, a vote of thanks was passed to Mr. Dalryell, the Earl of Hopetoun, and the leader of the visits, Mr. Thomas Ross.

## CHIPS.

The 50th anniversary of the foundation of St. Peter's College, Radley, will be observed on St. Peter's Day, June 29. The council have decided to mark the occasion by extending the big school in a manner which will provide additional accommodation and still preserve those features with which Radleyans are most familiar. The plans are being prepared by Mr. T. G. Jackson, R.A.

An exhibition of fireproof materials made from asbestos is to be opened in the large hall of the Society of Architects, St. James's Hall, Piccadilly, at one o'clock on Monday next. The exhibition has been organised in order to demonstrate means of assisting in the prevention of loss of life by the use of non-inflammable decorations in our homes and public buildings.

The secretary for Scotland has issued a provincial order on the application of Bo'ness Burgh Commissioners empowering them to put into force the provisions of the Lands Clauses Acts in respect to the purchase and taking of lands situated in the parishes of Torphichen, Linlithgow, and Bo'ness and Carriden, for the purpose of providing an additional water supply for the burgh. It is proposed to impound the Wardlaw and Kippis burns on the estate of Lochcote, about six miles to the south-west of the burgh. A reservoir covering about 30 acres will be constructed, receiving the water from a drainage area of about 500 acres.

The Joseph Thomson Memorial is now nearly completed, and it will be unveiled by Sir Clements Markham, K.C.B., president of the Royal Geographical Society, at Thomson's native town, Thornhill, near Dumfries, on Tuesday, June 8. The memorial, which has been designed by the sculptor, Mr. Charles M'Bride, of Edinburgh, is of Classical design, and is in the form of a truncated obelisk pedestal, raised on three steps into a moulded base and cornice. The four sides are panelled. One is occupied by a bas-relief representing a female figure of fame upholding a map of Africa, with palm-trees, and Mount Kilima-Njaro in the background. The pedestal is further decorated with masks representing the heads of lions. The whole is surmounted by a bust in bronze of Joseph Thomson.

Recent excavations for building purposes in Queen Victoria-street, near the corner of Walbrook, have resulted in the discovery, about 26ft. below the surface, of several relics of the Roman occupation of the City, including a Laguna, a bronze balance, and a large iron nail. The Laguna is a two-handled vase of fine buff ware, about 8in. high by 7in. at its greatest diameter. The balance is of yellow bronze, and is about 14in. in length. At each end of the beam is a double hook, from which the articles to be weighed were suspended, while at the centre is a small loop for the handle. One half of the beam is divided into fractional parts, like a steelyard; but the sliding weight is unfortunately wanting. While in use the balance was subject to rather rough treatment, as the original loops through which the double hooks pass have been broken off, new ones being riveted on in their place. The iron nail measures 12½in. in length, the head being 2in. in diameter. Similar specimens were obtained from some piling of Roman date in the Thames near Dowgate, and are preserved in the City Museum, Guildhall, where the above-mentioned relics are also to be seen.

## WATER SUPPLY AND SANITARY MATTERS.

**A RESERVOIR ON BARE BEACON.**—The South Staffordshire Waterworks Company are constructing a capacious reservoir on the summit of Barr Beacon for the purpose of supplying the higher parts of West Bromwich, Walsall, and adjacent towns. Within the past two or three years the company have sunk new wells near Bourne Pool, and have found a good supply of water. It is proposed to pump this water into the new reservoir, and lay pipes to the places mentioned, so that the higher points may have no reason to complain, as they have heretofore, of an inadequate water supply. The reservoir is being constructed from the designs of Mr. H. Ashton Hill.

**BRADFORD.**—Mr. Rienzi Walton, C.E., inspector under the Local Government Board, held an inquiry in the council chamber, at the Bradford Town-hall on Monday, into the application by the Bradford Corporation for sanction to borrow £50,000 for works of sewerage and drainage. The town clerk (Mr. Geo. McGuire) said the proposed sewers would comprise new ones required for the drainage of districts in the borough, new sewers to replace old sewers which were no longer suitable, and special relief sewers for the carrying off of storm water. From time to time £282,000 had been expended in the construction of sewers alone, in accordance with the main sewerage scheme of Bradford, and these works were distinct from sewage disposal works. That total amount had all been expended, and £50,000 was required to go on with the scheme. The total amount which the corporation were authorised to borrow under the provisions of the Sanitary Acts and Public Health Act was £1,593,680. Nearly the whole of that amount had been borrowed from time to time, while £474,462 had been repaid. Evidence was given by Mr. J. H. Cox, borough surveyor, and others.

**POCKLINGTON.**—The Pocklington Rural District Council have instructed Mr. D. Balfour, M.Inst.C.E., of Newcastle, the engineer for the urban scheme of main sewerage and sewage disposal for the town of Pocklington, to prepare plans and report on a scheme for the drainage of Barmby Moor district to be connected to the above by arrangement with the urban council, who have given the engineer instructions to have the Beck running through the town substituted by an arch of suitable size.

On Sunday the solemn function of laying and blessing the foundation-stone of the new church of St. James took place at Ballintubber. The Most Rev. Dr. Clancy, the Bishop of Elphin, performed the ceremony. The building is in the Italian style, and will consist of nave, transepts, chancel, sacristy, and organ gallery. The measurements comprehend a building of 102ft. by 61ft., and 27ft. across the transepts. There are, in addition to the high altar, two side-altars, a three-light chancel window, and ten windows at each side of the nave. The plans have been prepared by Mr. J. Scannell.

The Metropolitan Bank of England and Wales, Limited, opened yesterday (Thursday) the new offices which have been erected at Mostyn-street, Llandudno, on the site of the old premises. The reconstruction has been carried out from the design of Mr. Humphreys, the resident agent of the Mostyn estates, Mr. T. Jones being the contractor.

The Liverpool Select Vestry held a meeting on Tuesday to consider the question of workhouse accommodation, which has become urgent. After a long discussion, the recommendation of a committee was adopted—namely, that the only course open to the board was to provide accommodation for the bed-ridden infirm upon a site other than Brownlow-hill or Kirkdale, and authority be given to the committee to find a suitable site for buildings to accommodate 500 or 600 inmates.

The Southport Corporation have purchased from their spring exhibition "Mists Lifting off Dartmoor," by E. M. Wimperis, V.P.R.I., the catalogue price of which is £315, for their permanent collection in the Atkinson Art Gallery.

The Countess of Chichester has opened the convalescent home which has just been erected at St. Leonard's in connection with the Railway Mission. The building is of red brick with stone dressing, and is in a situation overlooking the sea. The total outlay has been £7,000, not including the value of the site.

The Marquis of Londonderry opened on Friday a new school in Page's-walk, Old Kent-road. The school adjoins the Guinness Trust Buildings—four huge blocks of model dwellings containing nearly 600 tenements—and has accommodation for 358 boys, 353 girls, and 453 infants. Lord Londonderry said the school was the 413th school opened by the London School Board. The site had cost £13,769 and the building £19,489. The total cost per head was £23 6s. 6d. The buildings included a schoolkeeper's house, a laundry centre, and a manual training school.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 6s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 6s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIII., LIV., LV., LVI., LVII., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

\* In response to complaints from readers that they are unable to get the BUILDING NEWS at Messrs. W. H. Smith and Son's bookstalls, we can only suggest that they should order the paper of some other newsagent. Messrs. W. H. Smith and Son recently requested us to allow them an extra discount beyond that allowed to the general trade, and because we declined they have ceased to send the paper out to their bookstalls. We have, of course, no remedy; but we do not think the demand was a fair one.

RECEIVED.—A. D. S.—F. W. C.—H. H. and Co.—M. E.—A. R. L. and Son (Belfast).

## "BUILDING NEWS" DESIGNING CLUB.

B. DRAPER. (The 30ft. depth from the street frontage for the upper part of the building means that the rear frontage of these premises and those adjoining it is 30ft. from the front or street line.)—L. W. ENSOR. (Pencil will not do. The scale for the elevation would be 8ft. to the inch, and plans 18ft. to the inch if desired. Drawings sufficient to illustrate scheme.)—B. PROCTOR. (28ft. is the width of the frontage, not 25ft., which, from the other dimensions, is obviously a misprint. There is no road at rear.)

## Correspondence.

## MONDAY'S MEETING OF THE R.I.B.A.

To the Editor of the BUILDING NEWS.

SIR,—Allow me, through your columns, to call the attention of members of the Institute to the importance of the issues raised by the report of the special committee on election of Fellows, which comes before the meeting on Monday evening next; and to earnestly request all those who have the interests of the Institute at heart to attend this meeting.—I am, &c.,

H. V. LANCHESTER.

Hon. Sec. R.I.B.A. Associates' Committee.

## R.I.B.A. ELECTIONS.

SIR,—With regard to a letter published last week by one of your contemporaries, in which reference was made to me, kindly permit me, through your columns, to state that I gave up practice in 1888, and not two years ago, as

alleged; and further that I am not, as stated, engaged by the London County Council in a capacity inconsistent with the profession of architecture. Were it otherwise, I might have become liable to suspension or expulsion under the provisions of by-law 22 of the R.I.B.A.

The Register of Fellows and Associates contains the names of about sixty architects who are officials in Her Majesty's service, or engaged upon the staffs of County Councils and other public authorities (exclusive of Metropolitan district surveyors and members in public employment who give private addresses); it is not unreasonable, therefore, to find that some of these prefer to be represented by one of themselves on the R.I.B.A. Council, rather than exclusively by practising architects.

Two allied societies of the R.I.B.A. have only three members of the Institute each, and yet each society may return a member for the Council. Architect-officials in public service, therefore, require further representation.—I am, &c.,

GEORGE H. BIRBY.

North End, Hampstead, May 22.

## CHIPS.

The will of Mr. Edward Baxter Langley, of 83, Stapleton Hall-road, Stroud Green, and formerly of Compton-street, who died on March 23rd, has been proved, the value of the personal estate being £2,997 18s. 2d.

A new English Congregational Church was opened at Penarth on Wednesday week. The building is Perpendicular in style, and has a tower and spire rising to a height of 112ft. The building is of Newbridge stone, with dressings and tracing of Bath stone. Messrs. Habershon and Fawcner, architects, Newport and Cardiff, prepared the designs; and Mr. D. G. Price, Penarth, carried out the work. The entire cost of the building, which seats 600 persons, is about £6,500.

The aggregate of the sales effected at the Auction Mart last week was \$135,420, as compared with £265,763 officially registered in the corresponding week of last year. The discrepancy between the figures of the two weeks affords no indication of the state of the market, which is quite as healthy now as it was then.

Mr. H. B. Gleason, at one time a well-known architect of Rochester, N.Y., committed suicide on May 10.

The arrangements for the laying of the foundation-stone of the new Marine-drive at Scarborough have been completed. The event will take place on Friday, June 25.

In the Court of Appeal, on Monday, before the Master of the Rolls and Lords Justices A. L. Smith and Chitty, an appeal was heard of the London Tramways Company from a judgment of a Divisional Court, upholding a refusal by Sir F. Bramwell, the arbitrator with regard to the purchase of the company's undertaking by the London County Council, to receive evidence as to present profits. It was admitted that the Court was bound by a previous decision of the House of Lords, on which the arbitrator has based his refusal; but a decision was asked for to allow of an appeal to that House. Their Lordships dismissed the appeal.

The Princess of Wales will be present to-day (Friday) at the ceremony of laying the foundation-stone of the new hospital in the City-road, to be performed by the Prince of Wales.

Mr. Walter Joyce, the senior partner in the well-known clock-making firm, died at Whitchurch, Salop, very suddenly on Friday. It is nearly a century and a half since the deceased's great grandfather started business as a clockmaker in Whitchurch.

The sewage purification works at Tonacliffe, Whitworth, belonging to the Whitworth Urban District Council, were opened on the 12th inst. They have been constructed from plans by Messrs. Hinnell and Murphy, C.E., Manchester and Bolton, engineers. The contractor for the construction of the buildings, tanks, and filter-beds was Mr. T. Taylor, of Rochdale, and Mr. Wolstenholme, of Radcliffe, supplied the whole of the tank-fittings and sludge-pressing machinery.

A stained-glass window has been placed in the east end of Tottenhall church to the memory of the late Lady Wrottesley. The window, which is the work of Mr. C. E. Kemp, of London, represents the Triumph of Good over Evil, and has been provided at a cost of £500.

The foundation-stones of the new Presbyterian Theological College, at Cambridge, were laid on Monday afternoon by Mrs. Lewis and Mrs. Gibson, the donors of the site. The plot of ground on which the college is being erected is at the back of St. John's College, off the Madingley-road. Mr. H. T. Hare is the architect.

## Intercommunication.

## QUESTIONS.

[11665].—**Slates.**—I am desirous of specifying for the use of bright green slates, or failing slates, plain tiles. I have samples of Westmoreland which are green when wet and grey when dry. Can any reader name a quarry from which thoroughly reliable bright green (pea-green) or a tiliery producing common tiles of such colour?—A. G. C.

[11666].—**Weak Floor.**—I have a floor of 6in. by 2in. deal, batten joists, 12ft. bearing. Walking over it cracks the ceiling below. How can I stiffen it? The floor-boards are barely 3in. thick. The only scheme that occurs to me is to take up one of these boards in the middle of the bearing and to fit across between the joists inch pieces of deal the whole depth of the joists, screwing them diagonally as well as I can (because any strong nailing would still further interfere with the ceiling of the room underneath), and then to lay over the joists a piece of bar iron, say, 2in. by 3in. or 3in., securely fixing same to top edges of joists with screws, and then re-lay the floor-boards, rebating or grooving same over the bar iron; or I could even, if greater strength is considered to be necessary, have the bar iron the same thickness as floor-boards, and to show flush on surface. Will some kind reader suggest any better method which may occur to him, and generally advise?—NOVICE.

[11667].—**Elizabethan and Queen Anne.**—I would be glad if any of your readers could advise one who are the best authorities on Elizabethan and Queen Anne architecture and what book would give illustrations of details of same.—AUSTRAL.

[11668].—**Iron Casements.**—Would any reader give me particulars as to how opening iron casements filled with lead-lights are fixed in stone mullions for first-class private houses? Also, the usual finishing inside the room—whether it is customary to expose the stone, or case it?—LAURENCE HOBSON.

[11669].—**Ceiling Decoration.**—A colonial architect staying in London for a few weeks desires to see some good examples of modern ceiling decoration, especially of good painted work, suitable for mansions and palaces, &c.—S.

[11670].—**Covering Concrete Roofs.**—Can any reader suggest a suitable material for covering concrete roof-slats in the Tropics, where periods of long and intense heat are followed by tremendous downpourings of rain? Cement and ordinary asphaltes have been tried, and found useless. Asphalt, even the kind laid in molten condition, soon goes to powder under the heat. Cement fails, not only as a covering, but even in the supporting concrete. The latter is best made of lime beaten hard and finished smooth; but it constantly cracks during the heats, especially over the wood or iron joists, and, in spite of the tar-plasters, &c., which are applied as stopping, even mansions and palaces are subject to a destructive amount of leakage.—W.

The total sum so far expended by the London County Council in the promotion of its various water Bills and opposing water Bills since the formation of the Council is £32,489.

A settlement has at length been arrived at between the Chester Corporation and the insurance companies as to the amount which the latter are to pay in respect of the damage done to the town hall nearly two months ago by fire. The corporation claimed £7,562; the companies have allowed £6,833. There is thus a difference between claim and concession of £729; but as the corporation are also allowed the salvage, which is valued at £500, the amount to be paid over does not fall so far short of the amount claimed. The cost of restoring the town hall, a work which is to be immediately proceeded with under the direction of Messrs. T. M. Lockwood and Sons, architects, of that city, will considerably exceed the amount of the insurance money allowed or claimed.

The foundation-stone of a new Congregational church was laid at Crosby, near Liverpool, on Saturday. The site is at the junction of Eshe and Mersey-roads, and adjoins a church hall, where services are now held. The church is being built from the designs of Messrs. Daggers and Fordham, of Chester, with facings and dressings of Runcorn stone. It will provide seating accommodation for about 600 persons, and will have a nave, north and south transepts, chancel, choir vestry, and clergy vestry. The amount of the building contract is £5,700.

The first meeting of the West of England and South Wales Federation of Building Trade Employers was held at the Guildhall, Bristol, on the 18th inst. On the motion of Mr. W. Symonds, seconded by Mr. W. H. Long, Mr. A. Krauss was unanimously elected president of the Federation for the ensuing year. Mr. Church moved, and Mr. C. H. Long seconded, that Mr. W. Symonds be appointed vice-president for the next twelve months. This was unanimously carried. Mr. Lintern (Cardiff) was elected treasurer, on the motion of Mr. S. Ambrose, seconded by Mr. Addicott. On the motion of Mr. Church, seconded by Mr. Dyer, Mr. Harris and Mr. Mercer were selected as auditors. It was also unanimously resolved, on the proposition of Mr. Mercer, seconded by Mr. Kitch, that Mr. Henry J. Spear be appointed secretary of the Federation. A general discussion ensued upon the conditions and relations of employers and employed in the various towns represented by the Federation.



## LEGAL INTELLIGENCE.

**ACTION FOR SLANDER BETWEEN BUILDERS.**—In the London Sheriff Court on Friday, Sheriff Burchell and a jury had before them the remitted case of "Quinn v. Richmond." It was an action brought by Mr. Thomas Quinn, builder, Bishopsgate-street, late M.P. for Kilkenny, against Mr. J. Richmond, also a builder, of Wandsworth, to recover £5,000 damages for slander. It was stated that while the plaintiff was lunching in February last at a Wandsworth hotel defendant endeavoured to enter into conversation with him. Mr. Quinn, not knowing the defendant, refused to talk, whereupon the defendant shouted, "He is a dynamitar, a murderer, a Phoenix Park colleague." Mr. John O'Connor, M.P., the plaintiff's counsel, said the plaintiff appeared before the Parnell Commission, and after being acquitted, continued to sit in Parliament for three years. The plaintiff stated that he merely wished to clear his character, and he would give any damages awarded to charities. The jury awarded plaintiff £150.

**NORTH BRIDGE ARBITRATION, EDINBURGH.**—The proof in the claim by Messrs. Köhler against the city having been closed, the speeches of counsel were delivered on Saturday, when the Solicitor-General was heard for the claimants, and Mr. F. T. Cooper for the respondents. Proof had been led for six days as to the value of the subjects belonging to Messrs. Köhler, and the amount to be paid them for the compulsory removal of their business. The claim amounts to over £10,000. The chief witnesses for the claimants in the case were Mr. Peter Lawrence, Mr. R. C. Millar, and Mr. George Smellie; and for the city, Mr. Hamilton Beattie, Mr. John Scott Tait, and Mr. Halden Beattie. Mr. W. W. Robertson and Mr. Ormiston are the arbiters, with Sheriff Jameson as oversman.

**DAMAGE TO ADJACENT PREMISES DURING BUILDING OPERATIONS.**—At the Blackburn County Court, on Monday, Robert Fulton, fish and fruit dealer, of 77, Darwen-street, sued Maria Whaley, of 155, Claremont-terrace, Preston New-road, to recover £40 damages alleged to have been sustained through the negligent manner in which workpeople engaged by the defendant carried out certain alterations to property adjoining the plaintiff's premises. Plaintiff's counsel stated that his client became the tenant in November, 1895, of his present premises, which, with an adjoining shop and a public-house, belonged to the defendant. In order to extend the public-house the defendant in June last pulled down the shop next door to the plaintiff's, and this work was done in such a way that clouds of dust settled on the plaintiff's fruit, &c., rendering it totally unfit for sale. Evidence was given to the effect that the window of the plaintiff's shop and its contents were often covered with dust. Mr. Haworth, for the defence, described the plaintiff's action as a bogus one, and entered with a view of making money out of his landlady. Several witnesses were called, including the architect, Mr. William W. Wilkinson, of Richmond-terrace, Blackburn, who stated that every care was taken to prevent dust blowing about, that the plaintiff had suffered little or no damage, that the £7 10s. was offered to the plaintiff simply because he was a tenant, and not because of any damage that had been caused him. His Honour said there was no question about the defendant's liability. Anyone pulling down a building in the best way he could was responsible for any damage done to his neighbour. The plaintiff had suffered substantial damage, and he gave him a verdict for £21.

A Committee of the House of Lords has passed the preamble of the Hastings Harbour District Railway Bill, which will be proceeded with. A rival scheme, the Hastings Harbour Railway Bill, has been rejected.

A Committee of the House of Commons which has been occupied for nearly three weeks with a Bill for the improvement and extension of the water supply at Nottingham has passed the preamble of the measure, with limitations. Under the new Bill the Nottingham Town Council will have a pumping station at Broughton. The town council is looking beyond Nottingham proper, and is also proposing to supply water to neighbouring places. This is a new departure in connection with corporation water supply.

The Metropolitan Asylums Board, at its meeting on Saturday, resolved, subject to the approval of the Local Government Board, to purchase from the City Corporation, for the sum of £53,000, the plot of land facing the Victoria Embankment, at the corner of Carmelite-street, with frontages of 93ft. to the Embankment, and 191ft. to Carmelite-street, as a site for offices for the managers.

A select committee of the House of Commons passed on Monday the preamble of the City of London Sewers Bill, under which it is proposed to dissolve the Commission of Sewers, and to provide for the execution of the powers, duties, and authorities of that Commission by the Common Council of the City.

## Our Office Table.

AN alarming interim report on the peril of destruction by fire to which the priceless collections at the South Kensington Museum are exposed has just been presented to Parliament by a Select Committee of the House of Commons. There are a number of old buildings, built of wood and lath-and-plaster, and in some instances covered with tarred felt, in close proximity to the modern permanent buildings which contain the bulk of these collections; and the danger has been aggravated by the erection of large temporary buildings constructed of fir framing, covered it is true on the outside with iron, but lined internally with varnished matchboarding. Attention has repeatedly been called, both in and out of Parliament, to the risk to which these collections are thus exposed; but the state of things above described goes on from year to year. The roofs of the galleries in which the Sheepshanks and Jones Collections, the Chantrey Bequest, the Water-Colour Gallery, and the Dyce and Forster Collections are housed are constructed mainly of unsuitable timber, and are especially open to fire damage, from the fact of having wood lanterns, skylights, and open sidelights. The walls are boarded and canvassed, with a space behind. The art schools adjoining these galleries are, from their construction and use, specially liable to the risk of fire, and the southern galleries themselves would fall an easy prey to fire. The report states that the reason why the structural alterations necessary for the protection of the collections from fire have not been made appears to be that the completion of the permanent buildings has always been in the contemplation of successive Governments, and the committee regard it as their immediate duty to lay before the House of Commons their very strong opinion that permanent buildings for the adequate accommodation of the collections at South Kensington should be proceeded with without delay. We do not expect great things from the Treasury or the present Government itself; but it will be a lasting disgrace to all concerned if this emphatic warning is disregarded.

The Select Committee of the House of Commons, which is considering the General Powers Bill promoted by the London County Council, has passed the preamble of the Bill so far as relates to the widening of the Strand at its narrowest part by the removal of the "island" of houses forming the north side of that thoroughfare and the south side of Holywell-street. The principle of betterment is only to be applied to those properties which have a frontage upon the north side of Holywell-street. They also consider that the new street, being of great width, will require refuges in the middle in various places. The Committee have also passed that portion of the Bill which related to the widening of Tottenham Court-road at the Oxford-street end by the removal of the block of buildings inclosing Bozler's court. On Wednesday the Committee gave its sanction to the proposals by the County Council for effecting street widenings at Holloway, Goswell-road, and Old-street, Battersea Park-road, and at St. George's Church, Borough, and for the acquisition of certain property at Hackney and Pimlico to be used for fire-brigade purposes.

The same committee then proceeded to the consideration of the Thames Subway (Greenwich to Millwall) Bill, also promoted by the County Council. The Bill provides for the construction of a footway under the Thames, from near the Ship Hotel at Greenwich to the Isle of Dogs, immediately adjoining the station of the Blackwall Railway. The cost is estimated at £70,500, including lands and property. The scheme will give a roadway 8ft. wide, and 9ft. 4in. high for foot-passengers. The object of the tunnel will be to facilitate the passage of workpeople from the Isle of Dogs to Greenwich. At present the workpeople very largely reside on the Isle of Dogs side, because they find that, owing to fogs, &c., the ferry service is occasionally unreliable. The only opposition came from the Great Eastern and Blackwall Railway Companies, who had a ferry agreement. There was no doubt the ferry would be injuriously affected by the tunnel, and the opposition mainly turned on the way in which the compensation was to be awarded. Among the witnesses called were Mr. W. Bull, chairman of the Bridges Committee of the County Council,

and Mr. A. R. Binnie, engineer to that body. The Committee declared the preamble proved, and that the petitioners were entitled to have the clauses they desired inserted in the Bill regarding compensation.

A CONFERENCE on rural housing was held on Tuesday at the Westminster Palace Hotel, under the auspices of the Land Law Reform Association. Sir Walter Foster, M.P., the chairman, spoke of the disgraceful conditions under which many agricultural labourers were housed, and mentioned the results of a recent inquiry undertaken by the association, which showed that not only were their houses deficient and defective in their structural and sanitary arrangements, but the water supply was disgraceful. In one case the inquiry extended over 169 parishes and embraced between 3,000 and 4,000 houses. One-fifth of the cottages reported on were "bad" or "extremely bad." A second inquiry extended over 247 villages, and embraced, probably, 10,000 houses. It was found that half that number of villages complained of bad cottages, one-fifth complained of insufficiency of accommodation, and one-sixth of a totally inadequate and dangerous water supply. Mr. H. J. Reckitt, M.P., read a paper on "The Present Condition of Cottages," which embodied the results of the inquiry referred to. After a long discussion, it was resolved, on the motion of Mr. F. A. Channing, M.P., seconded by Mr. Henry Broadhurst, M.P., that this conference was of opinion that the condition of the housing of the working-class population in a large proportion of the villages of England and Wales constituted an evil of serious public importance. Measures were needed to provide effective remedies. Mr. Stevenson, M.P., moved a resolution in favour of the amendment of the Housing of the Working Classes Act, 1890, so as to confer various powers on rural district councils in regard to the purchase or hire of land for building purposes, the building of cottages, and raising of loans for the purpose, &c. The motion was agreed to with the addition of a rider to the effect that if neither rural district councils nor county councils exercised the powers, the Local Government Board should, on the application of the parish council, hold a local inquiry, and, if necessary, should make an order on the rural district council to build such number of cottages with such accommodation as in the opinion of the Local Government Board was desirable.

PROFESSOR FERNOW, the Chief of the Forestry Division of the Department of Agriculture to the Secretary of Agriculture, United States, warns the Senate in his annual report, just presented, that the supply of pine timber in the States is rapidly diminishing. Indeed, he asserts that, at the present rate of consumption, the supply of white pine, spruce, and hemlock timber in the United States will last only about five years. The supply of white pine, the most valuable of all coniferous timbers, has been vanishing with great rapidity. Fifteen years ago, white pine was commonly used in New York and the West for floor-beams and studding, as well as for flooring and siding-boards, and for all kinds of exterior and interior finish; and in New England, although spruce had replaced it for framing, it was still the ordinary material for "siding" and finish, and was preferred for floors. Now, a builder in any of the great American cities would look with astonishment at a specification requiring him to use for floor-beams a material so precious as white pine, instead of the yellow pine and spruce, or possibly poplar, which have everywhere replaced it; white pine floors are practically no longer known, spruce and Southern pine having taken their place everywhere; white pine clapboards or siding are still specified by some architects, in deference to the traditions of the profession, but are, in the actual execution of the work, represented by rift-sawn spruce; and, for interior and exterior finish, whitewood or poplar is rapidly superseding the pine which was once thought indispensable for such work. Now, however, just as the builder had begun to accustom himself to utilising inferior woods in place of the incomparable white pine, he learns that the inferior woods are themselves vanishing, so that before another decade has gone by he will be obliged to find a substitute for them, as he has already substituted them for better material. Professor Fernow adds that the current belief that Canada possesses spruce forests which are virtually illimitable is a grave error, and that the Canadian supply will not do



much to delay the inevitable timber famine of the near future.

MR. ARTHUR R. G. FENNING, A.R.I.B.A., 46, Lincoln's Inn Fields, makes the following complaint as to the Academy catalogues in the *Times*:—"My friend Mr. W. H. Seth-Smith and myself sent to the Royal Academy our joint design (which was awarded the second premium) for the New Presbyterian Theological College at Cambridge. The drawing is hung, and bears our joint names as the architects. Unfortunately, by a clerical error, in my absence from town, the form sent in with the drawing contained Mr. Seth-Smith's name only; and the design was catalogued accordingly as his sole work. For this error, of course, the Royal Academy was not responsible. But immediately on the opening of the exhibition the error was discovered, and both Mr. Seth-Smith and I wrote to the secretary and called at the Academy requesting the correction to be made in the revised edition, which we were informed would be issued during the next week. The revised edition has now appeared; but the correction has not been made, so that the fruit of my work as an architect is quietly left to be gathered by another. It is said, 'There is no wrong without a remedy'; but having appealed to the Academy, I know of no remedy, except through your courtesy."

MESSRS. WINSTONE AND CO., LTD., Cross-street, Finsbury Pavement, E.C., and of Gray's Foundry, Stamford, have turned their attention to the improvement of the ordinary fireplace, and their illustrated catalogue just issued shows the success they have attained. Improved combustion, economy of fuel, and cleanliness have been the chief objects. The book before us gives a large variety of firegrates and their adjuncts of every style with painted mantels, some very elaborate, but many suitable for houses and cottages of all kinds. The height and width, projection of shelf, width of jambs, and if tiled or blacked, are given under each pattern. These mantel registers bear various names—e.g., the "Artizan," the "Marple," "Masbro," and "Model." All are good designs; some of them have improved backs, and others are new patterns. The prices are very moderate. Many of them have firebrick sides. The "Mistletoe" and "Conquest" are also very suitable designs. Several illustrations for overmantels of all prices, from the most ornamental to the simplest, are given; also several terracotta and faience fireplaces, enamelled, improved-combustion tile grates, reversible grate with revolving fire, hob grate with oven, and several patented smoke-consuming grates, cooking ranges, kitcheners, and dog grates. For patterns and prices of modern fireplaces, stoves, and ranges, Winstone and Co.'s catalogue ought to be in every office.

#### MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (To-morrow).**—Lewisham Antiquarian Society and St. Paul's Ecclesiastical Society. Joint Afternoon Meeting at Pulborough and Hardham, Sussex, under the guidance of Mr. R. Garraway Rice, F.S.A., Barrister-at-Law. London Bridge Railway Station (L.B. and S.C.R.), Portsmouth line. 1.35 p.m.

**MONDAY.**—Surveyors' Institution. Annual Meeting and Prize Distribution. 3 p.m.  
Royal Institute of British Architects. Business Meeting. 8 p.m.

**SATURDAY.**—Edinburgh Architectural Association. Visit Torpichen Church.

Dr. J. T. Thomas, the medical officer of health for Lowestoft, has been elected, from a very large number of candidates, to the position of medical officer of health for the two counties of Leicestershire and Rutland. Dr. Thomas was elected medical officer at Lowestoft about two years ago.

The partnership heretofore subsisting between G. A. Wilson and T. W. Aldwinckle, architects and surveyors, Victoria-street, Westminster, and the Vestry Hall, Cable-street, St. George's in the East, under the style of Wilson, Son, and Aldwinckle, has been dissolved.

Several additions have just been made to the recently-founded permanent collection of pictures in the Elizabethan mansion at Christchurch Park, the property of the Ipswich Corporation. The paintings include a portrait of an unknown gentleman of the 17th century, attributed to William Dobson; "Home-coming of a Dutch Gentleman and His Bride," by Egbert van Hemskerck; a "Nativity," by an unknown artist; and among the gifts by townsmen, of works by modern local artists, are "Dunwich Cliffs," by W. D. Batley; and "The Birth of the Conway," by E. B. Smythe.

## Trade News.

### WAGES MOVEMENTS.

**BLACKPOOL.**—The dispute between the masters' federation and the union men employed in the various building trades at Blackpool was waged last week, but terminated amicably on Friday night, the employers having conceded the point that no labourer shall be employed on skilled work.

**DUDLEY.**—On Saturday night a meeting of the carpenters and joiners on strike in the Dudley district was held at the Windmill Inn, Dudley. Mr. J. Matthews (Birmingham) presided. Delegates from Birmingham, Wolverhampton, and other towns assured the Dudley men of assistance as long as the strike lasted; and a resolution was passed expressing the determination of the strikers to remain firm to their demand of an advance of one penny per hour, and the adoption of a code of working rules.

**DUNDEE.**—A settlement has now been effected in the strike which occurred amongst the men connected with the Dundee furniture trades. The operatives sought to have the minimum wage fixed at 7d. per hour, and the masters having consented to the terms sought, work was resumed on Monday.

**EDINBURGH.**—At a representative meeting of the plumbers of Edinburgh, Leith, and district, held in Dowell's Rooms, Edinburgh, the differences that have arisen with the operatives with reference to the rate of wages and working rules were fully discussed. It was agreed to increase the rate of wages to 8½d. per hour, and to pay time-and-quarter to men required to work on holidays. The operatives demanded that a standard rate of wages be fixed. To this the employers could not consent, and they resolved to abide by the present rule, that wages be paid according to ability, but that first-class workmen receive 8½d. per hour. The employers agreed that all cases of dispute should be referred to an arbiter, who shall be requested to give his decision within twelve days. It has been mutually agreed that three months' notice be given in each year by either party of any alterations on the working rules.

**GREENOCK.**—The plasterers had, from Monday, their wages reduced from 10d. to 9d. per hour, in consequence of the pressure in trade being now over for the season. The joiners of Greenock have modified their original demand of 1d. per hour to one of ¾d. per hour, and have intimated to the masters that if this increase now asked be not conceded they will strike work on June 1.

**IPSWICH.**—The local branch of the Amalgamated Society of Carpenters and Joiners have for some time been in communication with the Master Builders' Association with reference to a new code of rules which the latter have insisted shall be carried out. No settlement having been arrived at, over 100 members of the former society and about 50 non-society men struck work last week, and building operations, which are being carried out to some considerable extent in the town at the present time, have been seriously hindered. The committee of the society, however, do not look at the matter in the light of a strike, but state that they are standing out on principle as a protest against the determination of the masters to compel adherence to their new rules.

**LEIGHTON BUZZARD.**—Since the local bricklayers' application for increased remuneration has been so successful, the workmen in other departments of the building trade have shown a desire to follow in their footsteps. A committee of carpenters have been appointed to ask the masters for an increase of wages from 6d. per hour to 6½d.

**LIVERPOOL.**—The plasterers gave six months' notice, expiring on May 1 last, to the employers for an advance of ¾d. per hour—from 9d. to 9½d.—and a new code of working rules, chief among which were clauses limiting the number of apprentices, and that no persons other than plasterers be allowed to do plasterers' work (which the operatives contend includes cement flooring, floating for tiles, and wood blocks). Several meetings have been held between masters and men, and as a result the masters made an offer to the operatives for an advance in wages to 9½d. per hour, the present code of rules as worked to by the other trades being offered, with an understanding that only plasterers be employed by master plasterers to do plasterers' work, and that all apprentices be bound for not less than five years. This was refused, and the men to the number of 150 ceased work on May 1. A further offer by the masters to submit the whole matter to arbitration was also declined. The plastering of a very considerable amount of public work is stopped, including the new General Post Office.

**NORTHWICH.**—The Northwich bricklayers, who came out on strike on the 1st of May for an increase of 1d. per hour, held a general meeting on Saturday night, and by an overwhelming majority refused to

accept the offer of an additional halfpenny. A deputation communicated the decision to the builders, who thereupon resolved that the offer should hold good for a week, and then be withdrawn. They absolutely declined to make any further concessions. The men have hitherto received 8d. per hour, and claim that this is 2d. below the standard rates in the Manchester and other districts.

**PLYMOUTH.**—Several of the master builders who were occupied last week in searching for men in various parts of Devon, Cornwall, and Somerset returned on Saturday in time to attend the evening meeting of their association. They reported having secured a considerable number of carpenters and plasterers, some of whom had already arrived in the town, and these were allotted to the various employers, whose needs were met, as far as possible, according to their respective circumstances. Arrangements were also made at the meeting for a deputation of builders to consult with representatives of the Masons' Society late in the week, with a view to bringing about an amicable settlement upon the points in dispute, and which, it is hoped, will result in the avoidance of a strike occurring in this branch of trade in October, when the six months' notice will terminate.

**THE POTTERIES.**—The dispute between the members of the Potteries and Newcastle district of the National Amalgamated Society of Operative House and Ship Painters and Decorators on a question of wages has been settled by the masters acceding to the men's demands for an increase of wages of ¾d. per hour, making the standard rate 7½d. per hour, and accepting the new working rules.

**WELSH SLATE TRADE.**—The negotiations between Mr. Young, Lord Penrhyn's chief manager, and the quarrymen's deputation have taken an unfavourable turn, unexpected difficulties having arisen at the last moment on the question of combination. It is stated that Mr. Young, on behalf of Lord Penrhyn, wishes to define what form of combination the men are to set up—a course to which they cannot accede. The management has also proved resolute upon two other essential points—viz., the question of a standard wage and the method of recommending work. A general strike throughout the whole Welsh slate trade is seriously contemplated as the only effective method of meeting what the men deem to be a combination against the effective application of trade union principles.

### CHIPS.

The Congregational church at Radcliffe, near Bury, Lancs., was reopened last week after internal decoration carried out by Mr. Reuben Bennett, of Manchester.

Dr. R. Bruce Low, one of the Local Government Board Inspectors, held an inquiry at the Audit House, Southampton, on Wednesday week with reference to an application by the town council for sanction to borrow £30,000 for the purpose of erecting an infectious diseases hospital. The town clerk (Mr. G. B. Nalder) said the site had already been inspected by the inspector, and the plans for the hospital had been adopted after open competition. Mr. Greenaway, the architect, produced the plans, and explained them in detail to the inspector. It was incidentally mentioned that the hospital would have accommodation for all kinds of infectious cases with the exception of smallpox.

It was reported to the Metropolitan Asylums Board, on Saturday, that the works now in progress included the erection of two new fever hospitals, and extensive alterations and additions to others, and represented a capital outlay of over £500,000. Plans for the erection of a smallpox hospital at Long Reach, for an infirmary for imbeciles at Tofting, and for the partial reconstruction of the North-Eastern hospital (the carrying out of which works would involve another outlay of £500,000) were awaiting the sanction of the Local Government Board.

The extension of Malmö Harbour, Sweden, is calculated to entail an expenditure of 1,800,000kr., or £100,000, which will be obtained by a loan. The east pier will be extended to about twice its present length, and by the construction of a new reservoir the area of the harbour will be about doubled. The depth will be about 24ft., and the harbour will be protected by a breakwater of some 2,500ft. in length.

Mr. R. G. Thomas, architect and surveyor, the newly elected chairman of the Menai Bridge Urban District Council, qualified as a magistrate for the County of Anglesey at the Llangefni petty sessions last week.

Mr. Lawrence Jameson Goudy, for the past twelve years headmaster of the Heaton Science and Art Schools, Newcastle-on-Tyne, died on Thursday last week at his residence, 54, Rothbury-terrace, Heaton. Mr. Goudy was only 37 years of age, and had been in ill health for some time. In 1892 he was elected a nonsectarian member of the Newcastle School Board. Mr. Goudy served his three years, but did not again seek election.



## LIST OF COMPETITIONS OPEN.

Hipperholme—Urban District Council Offices (£2,000 limit) .....	£10	J. E. and E. H. Hill, Clerks U.D.C., 4, Harrison-road, Halifax .....	June 7
Morecambe—Hotel Metropole .....	£100 (merged), £50, £25, and £15	Baxter and Abbott, Back-crescent, Morecambe .....	16
Elne, France—Water Supply Scheme (3,300 inhabitants) .....		La Marie, Elne, Pyrénées Orientales .....	July 1
Howth—Presbyterian Church .....	£20 (merged) and £10	Rev. James Wilson, 4, Rhoda Villas, Howth, Co. Dublin .....	20
Bootle—Technical School, Balliol-road (£15,000 limit) .....	50gs., 30gs., 20gs.	J. A. Crowther, Borough Engineer, Bootle .....	31
Carlton, Victoria—Children's Hospital .....	£103, £50, £25	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia .....	Jan. 30
Chesterfield—Brewery-street Board School (360 places) .....	No premium offered	C. J. Kerslake, Sec. to Managers, School Board Offices, Chesterfield .....	—
Bexhill-on-Sea—Drinking-fountain & Dog-trough (£200 limit) .....	No premium offered	Hon. Sec. Col. Lane Memorial, Standerton, Bexhill .....	—
Burnley—Fountain, Queen's Park (£500 limit) .....	£10, £5	G. H. Pickles, Borough Surveyor, Burnley .....	—
Bury, Lancs—Art Gallery and Free Library .....		The Town Clerk, Bury, Lancs .....	—
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit) .....	£25, £10	Borough Surveyor, Salter Gate, Chesterfield .....	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Cashel—National School .....		Rev. Geo. Nelson, P.P., Greencastle, Co. Tyrone .....	May 29
Elland Edge—Stabling, &c., Royal Oak Inn .....		F. L. Horsfall and Son, Architects, Lord-street Chambers, Halifax .....	29
Thornaby-on-Tees—Tower and Spire, St. Paul's Church .....	Vicar	T. H. and F. Henley, Architects, 42, Tyrrell-street, Bradford .....	29
Earlsheaton—Two Houses, High-road .....		W. and D. Thornton, Architects, Oates-street, Dewsbury .....	29
Leeds—Two Houses, Leeds-road .....		F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury .....	29
Blackpool—Vicarage, Egerton-road .....	Pioneer Industrial Society	Garlick and Sykes, Architects, 51, Market-street, Blackpool .....	29
Berwick-on-Tweed—Farm Buildings, West Edge .....	St. Paul's Building Committee	J. Stevenson, Architect, Berwick-on-Tweed .....	29
Coxhoe—Farmhouse, Comforth Moor .....	Corporation	J. Shearer, Bearpark, Co. Durham .....	29
Barnsley—Enlargement of Mechanics' Institute .....		Senior and Clegg, Architects, 15, Regent-street, Barnsley .....	29
Maryport—Three Houses, Station-street .....		Owner, 88, Senhouse-street, Maryport .....	29
Lower Bearn—Repairs to Farm Buildings .....		J. Barron, Weir View, Totnes .....	29
Great Yarmouth—Lavatory, Beach Gardens .....	Corporation	J. W. Cockrill, Borough Surveyor, Great Yarmouth .....	29
Romsey—Alterations, Workhouse .....	Board of Guardians	J. Allsop, Clerk, The Abbey, Romsey .....	29
Salisbury—Four Cottages, Ivy-street .....	S. Fawcett	J. Harding and Sons, Architects, Salisbury .....	29
Selly Oak—Church Day Schools .....		Lawender and Ellis, Architects, Selly Oak .....	29
Penraddock—New Church .....		C. J. Ferguson, F.S.A., Architect, 50, English-street, Carlisle .....	29
Wrexham—Shop and Dwelling Houses .....		W. Slater, Architect, 9, High-street, Wrexham .....	29
Paddle—Additions to Schools .....		Rev. T. P. Moorhouse, Paddle, Cockermouth .....	29
Wallington—Eleven Houses .....		Wm. Buck, Architect, 60, West-street, Horsham .....	29
Treharris—Converting Factory into Dwellings .....	Lords in Trust	F. James and Sons, Solicitors, Merthyr Tydfil .....	29
Sheffield—Pupil Teachers' Centre .....	School Board	H. W. Lockwood, Architect, Pinstone-street, Sheffield .....	29
Barnton—Shelter, Fences, Paths, &c. .....	School Committee	E. Hindley, Clerk, Runcorn-street, Barnston .....	31
Cromer—Boiler House, Sheds, &c. .....	Gas Co.	P. E. Hamsell, Secretary, Cromer .....	31
Dinas Powis—Two Shops and Houses .....	T. J. and J. Howells	John Howells, Grocer, Dinas Powis .....	31
Hastings—Priory-road School, West Hill .....	Hastings U.D. School Board	J. H. Tendall, Clerk, 4, Bank Buildings, Hastings .....	31
Levenshulme—Council Office, Stables, &c. .....	Urban District Council	J. Ogden Hardicker, Clerk, 141, Stockport-road, Levenshulme .....	31
Hornsey—108 Workmen's Dwellings, Nightingale-lane .....	Urban District Council	F. D. Askey, Clerk, Southwood-lane, Highgate .....	31
St. Leonard's-on-Sea—Infants' School, Boepoe .....	Hastings School Board	Elworthy and Son, Architects, London-road, St. Leonard's .....	31
Hanley—New Shopfronts, Market-terrace Buildings .....		J. Lohley, Borough Engineer, Hanley .....	31
Bradstone Hill—Dwelling House .....		Wise and Wise, Architects, Llaneston .....	31
Hastings—Additions, Priory-road School .....	School Board	J. H. Tendall, Clerk, 4, Bank Buildings, Hastings .....	31
Crook—Enlargement, Boys' School, Croft-street .....	War Department	R. Dixon, Clerk to School Board, Crook .....	31
Sandhurst—R.E. Workshops, &c., at Royal Military College .....	Urban District Council	Lt.-Col. M. H. G. Goldie, R.E., North Aldershot .....	31
Filey—Offices, Fire Engine Station, and Depot .....	Urban District Council	F. A. and S. Tugwell, Architects, 102, Westborough, Scarborough .....	31
Pudsey—Primrose Hill Board School .....	Parish Council	G. Haines, Clerk, Farsley, Leeds .....	31
Paisley—Offices, Sneddon-street .....	Corporation	J. M. Campbell, New Sneddon-street, Paisley .....	31
Drogheda—Six Houses, Francis-street .....		P. Connolly, Town Clerk, Drogheda .....	June 1
Breckhampton—Rebuilding Church .....		Austin and Paley, Architects, Lancaster .....	1
Featherstone—Two Houses and Shops, Green-lane .....	Jas. Moxwell	W. H. Fearnley, Architects, Station-lane, Featherstone .....	1
Barton-on-Humber—Additions to St. Peter's Church .....	Black Sluice Commissioners	H. R. Dix, Solicitor, Barton-on-Humber .....	1
Bourne Fen—Painting Doors on Bourne Eau .....	Board of Guardians	Herbert Clarke, C.E., Boston .....	1
Keighley—Nurses' Home, Fell-lane .....		Judson and Moore, Architects, York Chambers, Keighley .....	1
Limerick—Rectory at St. Munchin's .....		Rev. T. B. Robertson, North Strand, Limerick .....	1
Pett, Hastings—Infants' National School .....		The Rector, Pett, Hastings .....	1
Uxbridge—Repairs to Market House .....		T. H. R. Woodbridge, Clerk, 58, High-street, Uxbridge .....	1
St. Bees—Villa .....	T. E. G. Marley	Moffat and Bentley, Architects, Whitehaven .....	1
Handsworth—Lodge and Boathouse, Victoria Park .....	Handsworth U.D.C.	E. Kenworthy, Surveyor, Handsworth .....	2
Lancaster—Additions to Workhouse Infirmary .....	Board of Guardians	J. W. Rounthwaite, A.R.I.B.A., 13, Mosley-st., Newcastle-on-Tyne .....	2
Chat Moss—Ten Cottages and Five Farmsteads .....	Manchester Corporation	R. D. Callison, Town Hall, Manchester .....	2
Haverton Hill—Engine Shed, &c. .....	North Eastern Railway Co.	Wm. Bell, Architect, York .....	2
Knutsford—Additions, Workhouse Hospital .....	Bucklow Board of Guardians	Geo. Leigh, Clerk, Union Offices, Knutsford .....	2
High Spenn—House .....	Dr. Smith	J. R. Stewart, High Spenn .....	2
Hurwich—Primitive Methodist Chapel .....	School Board	W. H. Dinsley, Architect, Chorley .....	3
Hucknall Torkard—Schools, Spring-street .....	Select Vestry	A. N. Bromley, Architect, Prudential Buildings, Nottingham .....	3
Magheragill—Chancel to Parish Church .....	E. Colbourn	G. L. W. Blount, Architect, Hampton-terrace, Belfast .....	3
Londonderry—Premises, Ferryquay-gate .....	Urban District Council	T. Johnston, Architect, 11, Eastwall, Derry .....	3
Canterbury—Soldiers' Institute, Northgate-street .....	Bryn Congregational Church	Major Fox, 18th Hussars, Cavalry Depot, Canterbury .....	3
Barry—Fever Hospital .....	Industrial Society	J. A. Hughes, Clerk, Holton-road, Barry Dock .....	3
Cwmfelin—Schoolroom .....	Governors	Wm. Jenkins, Secretary, Cwmarnhovel, Llanelly .....	3
Blaina—Ten Cottages .....	Merthyr Board of Guardians	D. Shepherd, Clerk, 1, Frederick-street, Cardiff .....	3
Cardiff—Girls' Intermediate School .....	Co-operative Society	F. T. James, Clerk, 134, High-street, Merthyr Tydfil .....	3
Aberdare—Dormitory, &c., at Training School .....	Town Council	R. Hamer, Secretary, Plas Celyn, Penmaenmawr .....	3
Penmaenmawr—Club-room .....	School Board	John Rust, City Architect, 224, Union-street, Aberdeen .....	4
Aberdeen—Additions to Bathing Station .....		Davies and Moss, Architects, 11, Regent-street, Wrexham .....	4
Llangollen—Additions, Board Schools .....	Gelligaer Rural District Council	W. G. Scott and Co., Architects, Worthington .....	4
Forstroms—Two Houses, Milling-street .....	School Board	F. T. James, Clerk, 134, High-street, Merthyr Tydfil .....	4
Hengoed—Offices .....	Board of Guardians	Kennett McRae, 5, Argyle-street, Oban .....	5
Bridge of Orchy, N.B.—Schoolhouse .....	School Board	B. Boycoll, Clerk, Chapel-en-le-Frith .....	5
Chapel-en-le-Frith—Workhouse Additions .....	Congregational Trustees	E. H. Smales, A.R.I.B.A., 5, Flowergate, Whitby .....	5
Glaiddale—Schools and House .....	Corporation	Hensoll and Paterson, Architects, 18, Norfolk-road, Sheffield .....	5
Barnsley—Mission Church, Farrar-street .....		C. G. Nantes, Town Clerk, Bridport .....	5
Bridport—Fever Hospital, North Allington .....		Wm. Drew, M.S.A., 22, Victoria-street, Swindon .....	5
Faringdon—Post Office .....		E. J. Toye, Architect, Londonderry .....	5
Londonderry—Library, Hall, and Baths, St. Columb's College .....	Urban District Council	Jas. Hill, Clerk, Ashton-in-Makerfield .....	6
Ashton-in-Makerfield—Additions to Depot .....		John Bond, Surveyor, Council Offices, Morecambe .....	7
Morecambe—Brick Chimney 129ft. in height, Engine and .....	Urban District Council	T. Everatt, Clerk, Tate Library, Streatham .....	8
Boiler Houses .....	Streatham Library Commissioners	The Town Clerk, Guildhall, Gloucester .....	8
Balham—Branch Free Library, Ramsden-road .....	Corporation	Medley Hall, Architect, 29, Northgate, Halifax .....	9
Gloucester—Additions to Technical Schools, Brunswick-street .....		J. G. Dees, Somerset House, Whitehaven .....	9
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Whitehaven—Post Office .....	Scottish Provident Institution	T. A. Buttery, Architect, Queen-street, Morley .....	10
Belfast—Premises, Donegall-square West .....		J. G. Skipton, Architect, Northgate-street, Athlone .....	12
Morley—Primitive Methodist Chapel, Bridge-street .....	Rev. Theo. Landey	Wm. Menzies, Eaglefield-green, Surrey .....	12
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Egham—Rebuilding Catherine Wheel Hotel .....	Hornsey U.D.C.	Rev. J. A. Roberts, Irethol Vicarage, Askan-in-Furness .....	15
Muswell Hill—Greenhouse (50ft. by 12ft.), Irish Corner .....	Royal Insurance Co.	J. Francis Doyle, Architect, 4, Harrington-street, Liverpool .....	17
Irethol—School Additions .....	Co-operative Society	R. M. Leland, Architect, Motherwell-road, Bellshill .....	19
Liverpool—Offices, North John-street .....	Industrial Provident Society	T. E. Crossland, Architect, Front-street, Stanley .....	31
Denny—Thirty-six Dwellings .....		Thos. Bell, Architect, Burnley .....	—
Beamish—Sixteen Houses .....		W. J. Moore, Architect, Whitehall Buildings, Belfast .....	—
Burnley—Rebuilding Church Institute .....		Secretary Connell Iron Co., Blackhill, Co. Durham .....	—
Belfast—Business Premises, Berry-street .....	S. Rhodes	J. J. Milligan, Architect, 77, Baxtergate, Whitby .....	—
Witton Gilbert—Institute .....		John Stafford, Twa-lane Ropery, Dukinfield .....	—
Hawsker—House and Stables .....		Colliery Offices, Denaby Main, Rotherham .....	—
Dukinfield—Offices, Half-Moon-street .....		E. R. Ridgway, Architect, Long Eaton .....	—
Denaby Main—100 Large and 50 Small Cottages .....		Oliver and Leeson, Architects, Mosley-street, Newcastle-on-Tyne .....	—
Derby—Alterations to Vulcan Ironworks .....	Ley's Malleable Casting Co.	The Works, Fenarth .....	—
Sacriston—South Aisle, &c., St. Peter's Church .....			—
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# THE BUILDING NEWS AND ENGINEERING JOURNAL.

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## MISAPPLIED FEATURES.

"WILL it look well?" This is the customary test question which is often applied to a design by those who will not give themselves the trouble to think out the logical steps by which it should be worked out. Many ill-suited and ridiculous features might be avoided if architects took the trouble to inquire what those were which really belong to a building, and the reasons of their choice. If architecture has any logical basis to rest upon, and we certainly claim that it has, it ought not to be possible to find so many absurdities and inconsistencies in buildings that we do, miniature imitations of great domes of large edifices on small buildings, copies of towers and spires of large cathedrals erected in connection with small village churches, and huge porticos, where simple entrances are sufficient. Misappropriation of scale is a fault which often merits obloquy and derision. To tack-on to a building of a few feet frontage a reduced feature from an edifice several hundreds of feet in length was at one time common enough. The same ambitiousness is seen in designs for ordinary buildings, where domical roofs, towers and gables, and elaborated façades appear adapted only for edifices of a very different size and class. Not many years ago it was the custom to adorn ordinary suburban or village churches with spires of considerable height, and with a profusion of detail that was quite out of all sense of proportion, and this folly has not yet disappeared. The funds are seriously overweighed by a large massive tower, the completion of which keeps the fabric in debt, and involves a lasting responsibility on those who wish to see the building in its integrity, ridden of the reproach of an ugly stump end. The money thus expended might have been more usefully applied on lengthening the church a bay or two, or adding an aisle. But ambition is a common fault. There are men who are never content except when they are erecting palaces and cathedrals every day; the more modest kind of architecture seems to be beneath their attention. If they cannot command money or magnitude, they try to make the most of what they possess by imposing on the eye a feature that will, at least, be pretentious enough to be seen. Ruskin has said about the value of magnitude: "A yard more across the nave will be worth more than a tessellated pavement, and another fathom of outer wall than an army of pinnacles." With men of this class the tessellated pavement and the "army of pinnacles" must be had at any price if they cannot command size. It has thus come about that the features of great buildings must be obtained if the reality cannot be secured.

The chief question before designing or adding a feature should be, "Is it a functional feature?" or "Does it properly belong to the structure?" If the designer always asked himself this question before introducing any feature like a tower, a turret, a cupola, a bay, a gable, an arch, or whatever else it may be, he would be guarding against many things that are objectionable or adventitious. Instead of which, the formula is, "Does it look well? I will try it at least, and if it looks well, it will do." This is the way we know half the designs turned out of architects' offices are made: they are the results of a system of selection, picking and choosing. Only the few really design—by

which we mean the thinking out a given problem according to certain logical steps or structural laws, applying to the investigation the resources of a cultured taste at every stage of the process. To such a person any given feature or "property" was in the first place a natural development from a certain plan and mode of construction, and to introduce such a feature in a new building demands the answering of such a question as we have suggested. Take, for example, a bay-window, its position, size, shape, and finish ought to be the result of the shape and dimensions of room, and the kind of material employed in its construction. Its finish and detail should be those dictated by a sense of appropriation and fitness, avoiding anything that aims only at being ornamental or picturesque, or any copy of another window conceived under different conditions. But this rule is far from being followed. The designer has been guided mainly by the appearance, or simply by the fact that it reproduces a type of bay that is seen in buildings of the style or age selected by the author. Several errors are likely to follow from this procedure. The window may be much too large or too small—generally the latter, as the spaces between the mullions would suffer from reduction from the original; the treatment and detail of the window might be quite unsuited to the material or kind of workmanship of the new work. Possibly the type of bay is not at all adapted to a modern residence to which it is attached. We have heard the remark often about such a feature that it is a copy from Haddon Hall, from Kirby, from Bramshill, or Longleat. The angle-towers of Wolaton have been copied in one or two of our country residences, and such famous old houses as those of Montacute and Hatfield can show the inspiration of many features that are now used as common property. How much more has one feature of our ancient churches, the spire, been laid under contribution! The spires of Salisbury, Whittlesea, Rushden, Heckington, Louth, and Grantham have been favourite models, but without any reference to the size and character of the edifices to which they have been attached. For country churches the broach spires of Northamptonshire, such as those of Polebrook, Warmington, Raunds, are much more suitable than the parapet class like that at Whittlesea; yet architects have been prone to indulge in this more ornate type. And have we not seen elaborate towers, like those of St. Mary's, Taunton, and Huish Episcopi added to town churches in a smoky atmosphere where the fine wrought stonework and details rapidly decay or become intolerably black, so absurd is it to transplant the Somersetshire stone tower into a smoke-laden town. These towers and spires were developments or outgrowths from a stone architecture under certain conditions of cost and working, which it is as ridiculous to imitate in London, or Birmingham, or Glasgow as it would be to apply the details of the Ducal Palace to an English building.

How often we see an elaborate window or a series of windows introduced to light, perhaps, a few small offices or apartments. They have been borrowed from an Italian palace or some Renaissance building. But they are introduced under very different conditions. They were originally designed for a Roman, Florentine, or Venetian palace under sunny skies and clear atmospheres; but they are too ostentatious or overburdened by heavy pediments and ordinances to be applicable to our English houses or city offices. Their overhanging pediments and columns, or pilasters, interfere with a free access of light. Those which adorn the Government Offices in Whitehall, or many of the club-houses in Pall Mall, are neither adapted to the rooms they light, nor are appropriate to their position. And the Modern Gothicism at first wofully applied the pointed-arched traceried window, which he used in domestic

and other buildings where light was of the first importance. It is unnecessary to refer to the examples of windows used by the Gothic revivalists—how the pointed arch and its cusped tracery were pressed into the most awkward situations, and made to do duty, not only in suburban villas, but in city offices and factories, and in the meanest situations. The first improvement was in rejecting pointed arches for square-shaped heads; next the abandonment of tracery for ordinary buildings. These developments of the pointed arch, so characteristic of the spirit of ecclesiastical architecture, were almost repugnant to the wants of secular buildings. We might spend some time over the question of the arch alone. Even now it is little understood as a feature. We see it applied to uses for which it was never intended. Nothing can look more painfully out of place than to see sharp-pointed arches close under the eaves of a roof like those of an aisle, and where flatter forms are more adapted. Many of the Gothic buildings of forty years ago are instances of the crude introduction of lancet arches in arcades and clerestories, as if windows of this shape could ever fit comfortably under horizontal lines, to say nothing of their discordant effect and the visual distortion produced by the proximity of arches to straight lines. Again, what can be a greater sham than an arch not really turned in masonry, but constructed of wood or other material. It is true we meet with wooden arches in many old Renaissance buildings, but they come rather under the denomination of architectural ornament. It is when a wooden or a "lath-and-plaster" arch assumes to be constructive and spans a large space that it becomes objectionable as a dishonest feature, as when a recess in a room is treated with an arch of this description. Still more reprehensible is a wooden or plastered arch across an apsidal projection in a concert-room. Why not real and constructive, if it supports a wall over, which must after all be carried by a wooden beam or girder? If there is any need for an arch, make it an honest one; if not, use a straight beam. The answer in every case ought to be dictated by structural reasons. No one who knew anything of the arch would construct one to carry a load of masonry without ample abutments. When these were small, he would use the beam. But architects still throw across a girder over their wide openings, and then try to disguise or conceal it by constructing a false arch of bracketing below, a piece of constructed decoration of the worst kind. And the buttress—how it has been abused? Stuck anywhere and everywhere but the right place simply as a decorative feature, when everyone knows it was originally a counterfort. It is one of those features which have obeyed the law of the evolution of many other architectural features, passing from a constructive origin to an ornamental purpose. In this case the natural law has been reversed: instead of a survival of the fittest type, it has been far otherwise during the Gothic Revival. Originally the buttress was a "gathering up" of the wall at certain points to resist an inward weight and thrust, but we have seen it in points where its use is without an object.

Is not the gable misemployed in many new buildings? Its origin was the termination of a span roof, now it is made an independent feature to which the roofing must conform. This would not be so bad, if the gable was always made to accentuate a main part like the hall of a building; but the misapplication becomes more apparent when it is placed just anywhere to suit the caprice of the designer or to make a display. Many flagrant cases of its misapplication may be seen in modern so-called "Renaissance" buildings and houses, where the architect has introduced it simply to break up the roof, or to make a feature where his plan or



grouping is defective. It is sometimes seen plentifully displayed along a façade, cutting up the roof by valleys, and making it extremely hard to preserve a good water-tight roof and to carry the rainfall away. A kind of architecture extremely irritating; woe betide all breadth and artistic simplicity! Lately the modern builder has appropriated the feature, and rows of street frontages may be seen in every part of London made up of a repetition of gables enriched by terracotta ornament, carved or moulded brick, stucco, rough-cast devices, or parquetry-work and sham timbering. Can we conceive anything so distracting and irritating than these succession of gables of the same height, varied a little in the filling-in. Some of the new West-end streets and squares have this gable epidemic stamped on them, with all its feverish excitement and restlessness. A dozen other features we may take at random to illustrate our text—turrets, oriel windows, pavilion roofs, and numerous details. The weakness of our architecture is quite as much in the misapplication of features as from ill-considered planning; but there could be no misapplication if designing proceeded from within outwards, every part being the logical outcome of the use assigned to it.

#### EXHIBITION OF PRACTICAL WORK.

AN interesting exhibition of specimens of practical work executed by candidates at the technological examinations from April to May, 1897, is now on view at the Imperial Institute. On the whole, the results of the systematic teaching of artisan students by the Examinations Department of the Institute are satisfactory, and the number of students who come up for examination has increased. In the upper rooms of the Institute are exhibited several specimens of work in carpentry and joinery, ship carpentry, cabinet-making, metal-plate work, plumbing, cotton-weaving, book binding, &c. The specimens of work in carpentry and joinery show considerable skill and patient execution, though the designs are not always the best, viewed from an architectural standpoint, and there is room for improvement in the answers in the ordinary grade.

The specimens of carpentry and joinery comprise models of roofs, trussed partitions, floors, models of staging, shoring, hip rafters, lantern lights, staircases, sashes and frames, doors, &c. A model of a roof-truss, with curved rib, by J. Wilson, is neatly executed; but the leaf filling-in at the corner of the collar is trumpy. A better example of a collar-beam roof in oak shows a careful system of jointing and bolting the curved brace to principal and collar. There is also a model of a well-trussed partition, showing the joints, with a side-door opening. A centre for a skew arch, suitable for a bridge, is illustrated by a well-executed model and specification describing the construction. The curve is parabolic, the ribs are composed of three thicknesses, consisting of 20 pieces, and kept 2 in. apart, with joints breaking. W. H. Glynn is the exhibitor. Lantern-roofs and cupolas are sent in by several students, and one or two of these show ingenuity and skill in design and construction. One of them is for a cupola, to be covered with copper, by Sydney H. Horne, the quantities of timber being given. A ventilation turret by W. Thomas is a fairly designed octagon-shaped structure, executed in oak, and shown by working details. Framed floors to a quarter full size are shown in several specimens. One of the problems in carpentry often seen in these competitions is the framing of an angle-tie for a roof. As a lesson in bevelling, Alf Col-liner's model is worth notice. T. R. Hansard sends a model of a hip angle-tie for a roof without eaves, showing the hip rafter notched down to tie-piece. A very cleverly-executed

piece of work is an elliptic curved lantern light, by W. Edgar Pearson; a model of one angle is shown 3 in. to the foot. The student shows how the face mould for diminished hip rafter is described, and the length and bevel of jack rafters. Models of king-post roofs and details of joints are numerous.

In the joinery division we notice a circular sash on segmental plan; a door-frame head, circular on plan and elliptical in elevation; a sill and bottom rail of casement to open inwards, by J. E. Pearce. A panelled door after Sir G. G. Scott, by Arthur G. Smith, of the Polytechnic, wreaths for stairs, curtain steps and scrolls, circular geometrical stairs, and other similar exercises are on view, in all of which there is much that is excellent from a technical point of view, though many of the examples are devoid of any artistic grasp. We have seen better models before in which there has been more ability evinced. The written and graphic answers in many cases are poor, and the writing and mode of expression are wanting in precision and correctness of language. The examples of cabinet-making—one a pedestal for coal bunker and the other a desk, both from Shoreditch, executed to half full-size—are creditable, and the metal-plate work is generally good. The plumbers' work, which consisted of bending 3½ in. pipe and branching a 3 in. pipe into the same with soldered joint is a test that has been tried with varying degrees of success, and the examples set out on the floor of one large room are of some interest. The other test was a boss break and corners, according to a figured sketch. Four hours were allowed for these tests. The ordinary work done by the younger candidates appears to show the want of an elementary knowledge of science, as the principles of geometry or hydrostatics upon which plumbers' work so much depends. For instance, the pressure due to head of water, size of pipes, the laws of convection and other principles are matters of which the examiners in previous examinations have found the candidates to be ignorant. A great deal of the knowledge possessed by students of this class has been acquired by rote, and without any intelligent observation or verification. Specimens of bookbinding and cotton-weaving are also to be seen in this exhibition, and these are promising. Better work in every department would be found if the candidates possessed more correct ideas of science, and had some knowledge of art. Copying ordinary work and secondhand information are the inertia which have to be overcome in these exhibitions.

#### ADAPTABLE SPECIFICATIONS. XXXVIII.\*

##### NOTES ON THE SUPERINTENDENCE OF WORKS.

(Continued.)

THE quality of a painter's work depends considerably on that of his brushes. Though bad workmen are proverbially ready to complain of their tools, even the best workmen are far from being independent of them. Brushes of sable-hair are used for writing and decoration; but those meant for the painter's ordinary purposes are, or ought to be, of bristles. These vary in length, from 2 in. up to 8 in. or 9 in. They vary also in colour, some being white, others black, and others again of brownish or greyish tints. For practical purposes, the coloured ones are as good as the white; but though the latter are much more expensive, buyers of brushes prefer them because they are less easily adulterated with other materials. Adulterated, however, they very frequently are—sometimes with horsehair, and sometimes with vegetable fibre, said to be that of the American aloe. Even without adulteration, bristles themselves differ much, and may be very poor and inferior. They ought to be stiff, springy, and not too short; though the very long ones are generally weak. A brush in which horsehair is largely mixed with the bristles is

soft and flabby. After being used a short time, its badness is shown still more clearly by the way in which it wears. A good bristle brush, though worn, should keep firm and regular at the end; but one with much horsehair in it soon twists about in various directions till it is quite unfit for working with.

Vegetable fibre has its legitimate uses. It makes brushes well adapted for limewhiting and similar purposes, because the alkalies and alkaline earths do not soften and destroy it, as they do animal matters. But it is unfit for painting-brushes, because it has no spring and little tenacity. Bristles bent back will almost instantly straighten themselves, but not so vegetable fibre. In feeling it is harsh and rough, and it can be easily detected by its smell when heated. Horsehair, unfortunately, is not so readily distinguishable, as both it and bristles give off the same familiar odour when burnt.

In choosing a brush there are several points to insist on. The bristles should be straight, but when seen from the end, should have a tendency to turn inwards rather than outwards. The point of the brush should feel smooth, and not harsh; the latter quality suggests adulteration with fibre. The handle should not be too thick, nor should it project below the "binding" of the bristles. If it does, as often happens with common brushes, the hairs are forced apart, and the brush soon comes to have two or three ends instead of only one. The next thing after securing good brushes is to keep them clean, and in working order. This is a matter very often neglected. When they are in constant use day after day, they may be placed at night in water, just deep enough to cover the bristles. The handles, stock, and binding should be kept free from paint, and this should also be scraped away from the roots of the hair before the tool is put away for a time. Unless this is done, the paint will gradually dry there; and then, when the brush is in use, this dry paint will break up into small particles, which get mixed up with what is being laid on, and roughen it. If the water in which brushes are temporarily placed is not quite deep enough, the same thing will happen; while if it is too deep, the wooden part will swell, the "wrapping" of the brush will decay, and so the tool will soon be destroyed. Varnish brushes should never be put in water. If they are only going to be left for a few days, the varnish should first be got out of them as far as possible, either by rubbing them or scraping them with a palette-knife, and they should then be suspended in linseed-oil, in such a way that the hair does not press against the bottom of the vessel. A brush that is not soon going to be re-used should be properly cleaned, first by well rinsing it in "turps," and then by washing it with soap and warm water.

Matters like these may seem beyond the province of the architect. But unless he is familiar with them he will constantly be told—when he complains of bad workmanship—that the materials are those specified, and that they have been properly used, and that the result, in consequence, must, in spite of his protests, be all that it should be. It quickly disposes of such arguments if he can point, for instance, to the half-dried paint at the base of a brush, and show that this is the source of the "nits" on the surface which he is complaining of, and which the painter declares to be non-existent. Brushes, again, should be used lightly, and not pressed hard against the face which is being painted. Habitual pressure of this kind wears them down unevenly, so that it is impossible to use them without leaving streaky marks. The brush should be held at right angles to the face which is being painted, so the ends, and not the sides, of the bristles may touch it. Of course it is a vital matter to remove all dust before the painting is begun, and on new wall-plaster, to get rid of little inequalities and particles of loose stuff. In good work, every coat of paint is rubbed down with glasspaper or pumicestone, and then, of course, well dusted before the next coat is applied.

The tint given to the ground work in painting—that is, to the earlier coats which are to underlie the finished colour, is a matter of importance. Painters generally believe in a reddish ground, no matter what may be the hues finally intended. "If we want a rich black," we are told, "we should paint the ground with Indian red or chocolate colour, and we should thus get a better black than if the ground had been, for instance, of a leaden tone. But in painting a wall or door which had to be finished in light tints, we should only stain the first coat just enough to warm and

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mellow the subsequent ones." All surfaces to be painted on require to be free from grease; and old wall-plaster, for instance, should first be cleaned down with carbonate of soda (ordinary washing-soda) and water. The first coat on wood is usually mixed with raw, not "boiled," linseed oil, with a little litharge to dry it, and more or less thinned with "turps." This, being less viscous than "boiled" oil, sinks freely into the wood and fills the pores. Instead of using oil to begin with in bad and cheap work, a first coat of size or "clearcole" is sometimes put on; but this is liable to crack and peel, and should on all accounts be avoided. On plaster, boiled oil, used quite warm, is said to make the best priming coat; and it may likewise be used on Portland cement. The finer cements, such as Keene's, especially if they have been trowelled smooth, will not readily absorb linseed oil. If applied to them it simply forms a skin on the surface, without any close adhesion. The first coat, therefore, on these cements should be made up with at least as much turps as oil. Paper and canvas, before being painted on in oil, should have a coat of strong glue size. Wood which is to be varnished without paint has usually a coat of size and then two of hard varnish. Graining, which in the ordinary way requires four or five coats of paint to begin with, is, according to Colonel Seddon's "Builders' Work," "sometimes done on a coat of size only, so that the natural colour of the wood shows through. A sort of imitation inlaying used to be executed on this principle. The whole surface, say, of a large piece of pitch-pine or deal, selected without knots and without any strongly-marked figure, was first of all grained over in water colours. Then the pattern which was to represent the inlay was painted or stencilled on it here and there in clear varnish. When the varnished outlines were quite dry, the whole surface was sponged over with water, which, of course, restored the wood to its original aspect, except where the varnish had protected the water-colour graining. When this, too, was dry, the whole surface had one or two more coats of varnish to finish it.

A few notes on mixtures of colours may be added here. Lemon yellow, according to Sir M. Digby Wyatt, mixes well with cadmium yellow, gamboge, orange vermilion, cobalt, emerald green, and oxide of chromium. Gamboge, with a little Mars yellow, gives a clear, warm, transparent colour. Cadmium yellow, mixed with carmine, gives a series of strong luminous shades, but it does not make good greens. The same may be said of Mars yellow. Rose madder, though delicate, is very pure and effective. With cobalt, in different proportions, it gives clean warm and cold purples. Carmine may be increased in brilliancy by using it over a ground of gamboge. Orange vermilion mixes well with cadmium yellow and lemon yellow. Cobalt makes a good green with lemon yellow, and quiet neutral tints with orange vermilion. French blue makes good violets with crimson lake. Burnt carmine and orange vermilion afford a strong, rich colour, and burnt carmine and cadmium yellow a quiet, flesh colour. Emerald green makes good tints with lemon yellow. Green oxide of chromium, a rich, deep, opaque green, mixes well with lemon yellow and with emerald green. Vandyke brown works freely and mixes well, and so does lamp-black. These remarks apply to both oil and water colour. The colours in the list just given are considered permanent, as are all the natural earths and ochres, whether raw or burnt. Indian yellow fades from the action of light and air, though it is not injured by lime. Prussian blue fades when exposed to light, and darkens through damp. The same thing happens with Antwerp blue. The lakes in general are extremely fugitive, but colours prepared from madder are durable. Chrome yellows are changeable even when alone, and are specially destructive to Prussian and Antwerp blue. Blue verditer and Saunders' blue, which contain copper, are fugitive, and become green when used in oil.

Colours suitable for distempering are not always those which are best for oil. Lime, especially in new plaster, acts on many pigments, so that the inexperienced workman may leave a wall bluish or purplish at dinner-time, only to find it, perhaps, of a lively green when he returns in the afternoon. In making up distemper colours, as the "vehicle" is water and not oil, so the "body" is usually whiting, and not white lead. Whiting is simply pure chalk or carbonate of lime, freed from gritty and coarse particles.

Zinc-white is sometimes used in place of it when greater opacity is desired; but this, of course, is much more expensive. Various kinds of size are mixed with the water to keep the "body" and the pigments in suspension, and to make them adhere to the work when the water dries off. Size is simply a very weak solution of glue, and "double size" is a rather stronger solution. Patent size is a kind of gelatine, free from the unpleasant smell of ordinary size. Whitewash is usually made by allowing a small quantity of water to remain on the whiting for several hours, and then by mixing it in the proportion of 6lb. of whiting to a quart of double size. For distempering in colours, the pigments have to be ground up in water, and uniformly mixed with the moist whiting before the size is added to it. For yellow distemper, Oxford ochre is a favourite and durable pigment. It mixes well with Venetian red and Indian red to form various shades of cream-colour and buff, and with small quantities of burnt umber or black it gives various "stone colours." Chrome yellow and its compounds are not permanent, which, considering their raw and staring effect, can only be considered a fortunate circumstance. Raw sienna and burnt sienna are good transparent yellowish or reddish-brown colours, suitable both for mixing and for "glazing" over other tints. Artificial ultramarine is a blue of overpowering intensity, which makes few good mixtures, and which is a great deal more used for common work than its merits deserve. A blue, which is also bright, but which, as it is not destroyed even by adding quicklime to it, is specially convenient for distempering, is called lime blue. It enables newly-plastered walls to be finished in various tones of grey, which may be warmed into neutral lilacs or purples by the addition of Indian red. This last is a very permanent colour, and a very useful one to the painter in distemper. It mixes well, and is used, amongst other things, for softening and lowering the tone of what would otherwise be harsh and obtrusive greens. With lampblack it gives chocolate, and with blue-black various agreeable greys, warmer or cooler according to the proportions. Light red, or burnt Oxford ochre, will produce in mixtures many useful salmon colours and flesh colours. Venetian red is brighter and equally useful. Vandyke brown, raw and burnt umber, and asphaltum are amongst the best browns. Turkey umber is perhaps the richest of them in colour, and makes good drabs and stone colours by the addition of a little black. Blue-black is valuable for many purposes, and is used in small quantity for toning down the white-wash of ceilings. Drop-black is a dead jet black. Lampblack is chiefly used for common work.

#### OWNERSHIP OF PLANS.

A LONG discussion occurred at the last meeting of the Margate School Board with reference to the point whether the board, as the building owners, possess the right of ownership in plans prepared at their instructions by an architect. Some two years since the board invited competitive designs for schools in New Cross-street from local architects, and eventually selected the set submitted by Mr. R. Dalby Reeve, of 14, Cecil-square, Margate. These were duly carried out, and when the work was done, the board demanded that the plans and drawings be given to them. Mr. Reeve declined, on the ground that they remained his property; and to bring matters to a point, a cheque for £65 was drawn by the board in Mr. Reeve's favour for the balance of his fees and commission, conditionally upon his handing over the plans connected with the work. Mr. Reeve replied, maintaining his ground, and stating that it was the recognised custom in the profession for an architect to retain the whole of the plans and drawings used in connection with buildings carried out by him, the only exception being in cases where the works had not been carried out, when, on payment of the architect's fees of 2½ per cent., the client had reasonable grounds for asking for the plans to be delivered to him. He added: "In the particular cases now in question it should be borne in mind that school-planning is a special class of work, and that the plans and drawings contain information of a private nature which I think you will agree it is not fair nor reasonable that I should be called upon to divulge. I have made a particular study of school work for many years, and if the whole of my detailed plans and drawings were made

public property, the confidential information expressed thereon might be used by other persons to my detriment." After an animated discussion, it was agreed to consider the question from its legal standpoint in committee, and the matter will again come up at the next meeting of the board.

#### THE SOCIETY OF ARCHITECTS.

THE seventh ordinary meeting of the current session of the Society of Architects was held on Thursday evening in last week, Mr. Robert Walker, J.P., the President, occupying the chair. Mr. Ellis Marsland, hon. secretary, announced with regret the deaths of two members—Mr. Thomas W. H. Miller, of 11, Servia-street, Leeds, who joined the Society in 1893, and Mr. J. C. Christison Beddoe, of Lammermoor, Townsville, Queensland, whose membership dated from 1890. A vote of condolence was unanimously accorded to the relatives of the deceased.

#### THE FORUM OF ROME.

A paper on this subject, illustrated by plans and a large number of lantern views, was read by Mr. ALFRED FISHER, of Southsea, Associate. The lecturer pointed out that recent excavations in the Palatine had proved the existence of a city long anterior to the attributed date of its founding by Romulus (753 B.C.). Still, the mythical story of the suckling of the twins by a wolf had long been a favourite subject for illustration in painting and sculpture, an example of the latter being the celebrated bronze wolf of the Capitol Museum, of which an illustration was thrown on the screen. The wolf was archaic work, and to it twins were added in the 16th century, and these it would be seen had a much more realistic appearance. The reconciliation of the Romans and Sabines, after the war resulting from the abduction of the women of the latter race, was supposed to have taken place in the Forum of Rome, and this was the first occasion on which it was mentioned. A map would show that the Forum formed the floor of a valley at the base of six out of the seven hills on which the city was built, and around this central open space the public and religious buildings were naturally erected. Mr. Fisher proceeded to describe the buildings in the Forum, which belonged to three periods, those of the Monarchy, Republic, and Empire, extending over a period of more than thousand years down to A.D. 306. These buildings exhibited numerous and various examples of applications of the Greek Orders, and also of that remarkable feature, the arch, erroneously credited to the Romans. Dealing in detail with these remains, he showed that those dating from the Monarchy are but three, or perhaps four, consisting only of two superposed cells of the Mamertine Prison, over the entire site of which the church of S. Giuseppe da Talegnami has been built; the Cloaca Maxima, constructed of huge blocks of stone by the elder Tarquin before 579 B.C. and still fulfilling its original purpose; the Temple of Jupiter on the Capitol, of which only the foundations are in existence; and possibly a fourth building, the Temple of Vesta, might be included in the scanty list. The principal erections under the Republic were the Temple of Saturn, restored by Augustus, probably the earliest Roman building in the Ionic style; the Temple of Castor and Pollux, the three columns of which were described in all the older architectural books as part of the temple of Jupiter Stator; the Temple of Concord, now only represented by parts of the pavement; of the Tabularium, a plain building of the Doric order; and the Basilica of Justinian, which was afterwards rebuilt, after destruction by fire, on two or three occasions. It was not until after the establishment of the Empire that we saw it at its greatest splendour. Although recent authorities had cavilled at the boast of Augustus that he "found Rome of brick, and left it of marble," on the ground that he only added a marble face, yet, as could be seen by the remains, many of the Emperor's buildings were almost entirely of stone. Most of the existing remains in Rome belonged to the period between the death of Caesar and the days of Trajan. Two or three conjectural restorations of the Forum as it must have appeared in the days of the Caesars were thrown on the screen, the lecturer giving his grounds for differing from some of these attempts to revivify the past in the light of existing remains and recent excavations. Having shown the Arch of Titus, the lecturer gave illustrations



and a description of the Coliseum, closing with the prophetic lines from "Childe Harold's Pilgrimage":

While stands the Coliseum, Rome shall stand;  
When falls the Coliseum, Rome shall fall;  
And when Rome falls, with it shall fall the world!

Mr. G. A. T. MIDDLETON, A.R.I.B.A., in proposing a vote of thanks to the lecturer, said he felt sure he was expressing the wish of all present in thanking Mr. Fisher for enabling those who had never visited Rome to realise the wonderful character, size, and magnificence of the ancient buildings that still remained.

Mr. HENRY LOVEGROVE, A.R.I.B.A., vice-president, seconded the motion, remarking that although so wide a subject left little time for architectural criticism, the paper had been an exceedingly interesting one, as setting forth the glories of ancient Rome; it was refreshing to be able sometimes to get out of the beaten track of architectural papers.

The PRESIDENT, in putting the vote of thanks (which was carried by acclamation), added some remarks on the unique interest in buildings, history, song, and story which the Forum of Rome presented as a subject, and Mr. FISHER briefly replied, observing that while he felt technical drawings would have been more suitable for purely architectural purposes, his views had been selected on artistic or antiquarian grounds, and the kind reception his paper had received had justified the selection.

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—XVIII.

THE foregoing examples have been illustrative of the building up of simple pillars by the union of a few rolled sections. Pillars of large dimensions can be built up in this way, but it is

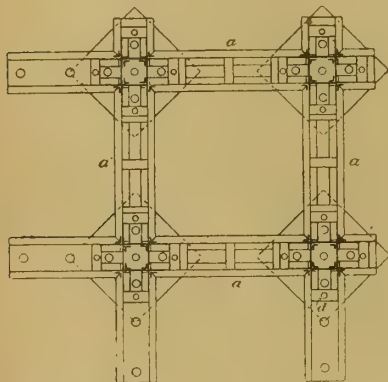


Fig. 86.

seldom that a cross-section of from 6ft. to 8ft. is exceeded. The construction of the large towers which have followed in the wake of the Eiffel tower, have afforded some good examples of the combination of columns to form one compound column, of a base sufficiently large to be self-supporting, resembling in this respect the great trestles of the American bridges, which are built on the same principle.

Fig. 86 is a plan diagram of the base of one of the four legs of which the Blackpool Tower is built. The four legs cover an area measuring 96ft. square, within which there is a circus and water show, and which is flanked by various side shows, &c. The legs each lean at an angle, giving reduced dimensions with increase of height. They rest on boulder clay, and foundations of concrete blocks, the faces of which are finished at a right angle with the axes of the leaning legs. Steel girders are built into the concrete to distribute the weight of the superstructure. A large steel plate rests upon each concrete block, and upon these steel plates are laid the girders upon which the legs are stepped. These girders are shown at *a, a, a, a* in Fig. 86, and the sections of the columns which stand upon them are indicated by the dark lines of plate and angle. The columns are each 2ft. 4in. square, and they are set at 16ft. 4½in. centres on the base. They are connected by a system of diagonal lattice struts. The pillars are plated on two adjacent sides, and open on the other two. Dimensions diminish, and details are modified as the height increases. The pillars are connected to the base girders by gusset brackets and by angles. Fig. 87 comprises two enlarged

sectional views of one of the pillars, showing its method of attachment to the girders. The lower view is taken across the pillar just above the gussets, and the upper view is a vertical section through the pillar, girder, diaphragms, and bolt-holes: *aa* are the gussets, *bb* the angles which

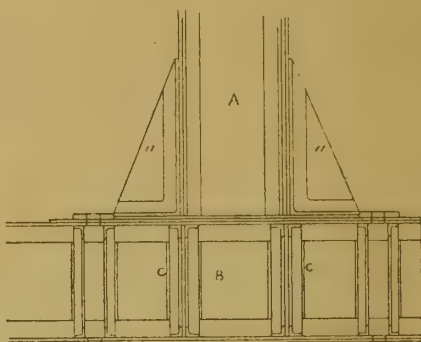


Fig. 87.

unite the pillar *A* to the base-girders *B*. Angles *c* pass down from the pillar, and are riveted into the corners of the box-girders. Diaphragms, *C*, are placed in these girders immediately under the pillars, to prevent risk of crippling. The girders are bolted down to the foundation with 16 bolts passing through the holes *d*, Figs. 86 and 87, and through the concrete to cast-iron plates bedded

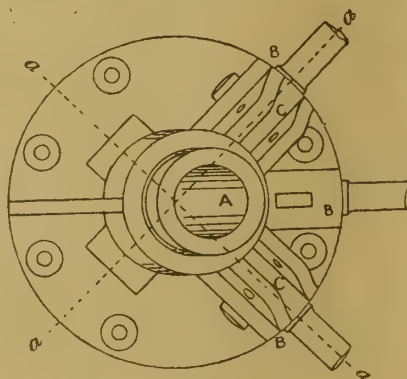
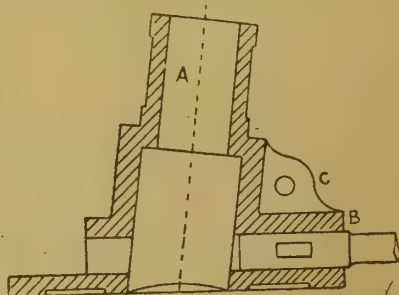


Fig. 88.

beneath the latter. The interior of the girders is filled with concrete, for the introduction of which the holes *e* are provided.

The grouping of columns to form a light yet stable building is adopted in the construction of some lighting stations. One of these structures

for the coast of New Jersey was erected at the Chicago Exhibition, and it was supported by eight iron cylindrical columns arranged in quadrangular form. One column occupied each corner of the square, and one was placed midway on each side of the square. The base measured 28ft. square, and the columns were inclined towards each other to support the gallery and lantern. The height was over 100ft., and a spiral stairway led up the centre between the columns. The whole was bolted to a concrete foundation. The column lengths were carried in sockets of cast iron, which also fulfilled the purpose of carrying the connecting bracing. The practice of using cast iron for such purposes is more common in America than it is with us, examples of which are given in the illustrations following. The bottom socket is shown in Fig. 88. The lower view is a plan, and the upper one a vertical section taken through either of the planes *aa* in the lower figure. The column fits into the hole *A*. The lugs *B* receive horizontal ties, while the vertical diagonal bracing is inserted between the lugs *CC*. The sockets at the top and in intermediate joints are different in form, but the same essential methods of union are adopted.

The use of cast iron in the form of lugs to withstand tensional stresses is not in accord with our ideas of safety. English engineers would generally use straps and lugs of wrought iron or

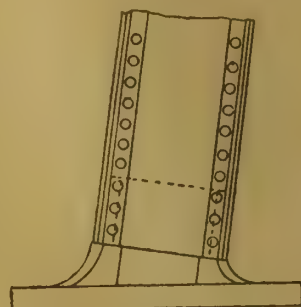


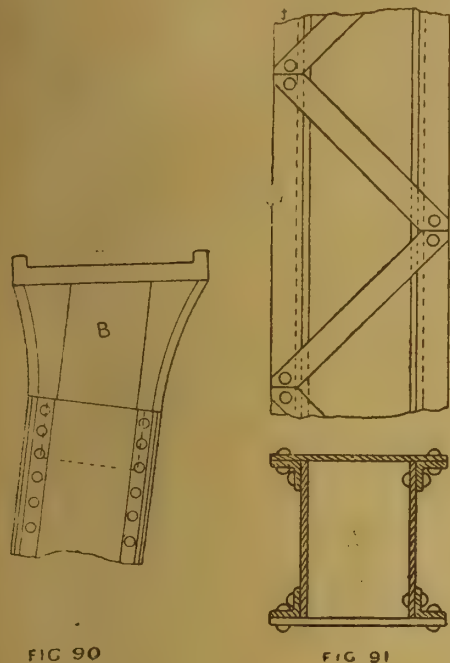
Fig. 89.

steel. Against this must be set off the fact that very excellent cast iron is used in the United States, being of a higher average quality than English iron, and specifications are stringent. As a matter of fact, it enters largely into details of this character on structures which have stood heavy rolling loads for many years.

The viaduct which spans the Kinzua Creek in the Alleghenies is the highest in the world, and the towers upon which it is carried are constructed of Phoenix columns connected with lattice struts and bracings. It is 2,052ft. long, and 301ft. high. Each tower is composed of four columns arranged at the four corners of a quadrangle, and inclining upwards towards each other on two sides. In the direction of the track the columns are set parallel; but in the transverse direction they are inclined at the rate of 1 in 6. This inclination was imparted in order to afford sufficient resistance to side wind pressure without the necessity of wind ties. All the towers measure 38ft. 6in. in parallel width, centre to centre of columns measured in the direction of the track. In the other direction, across the track, they measure 10ft. at the top, and spread out to various widths according to the height, the highest being 103ft. wide at the base. The tall columns are made in lengths of 30ft., united by internal sleeve-joints of wrought-iron tubes about 14in. long. Each tube is held in place with four bolts which



pass through the column, two of them being at right angles with the other two. The columns are 9in. in diameter outside, and from  $\frac{1}{2}$ in. to  $\frac{3}{4}$ in. thick. Figs. 89 and 90 show the elements of the



union of the columns to their bases and caps. A, Fig. 89, and B, Fig. 90, are castings, having sleeves set at the angle required, over which the columns fit. The bolts which unite the lattice struts to the columns also serve to secure the columns to their bases and caps.

The trestles of the Portage Viaduct, built in

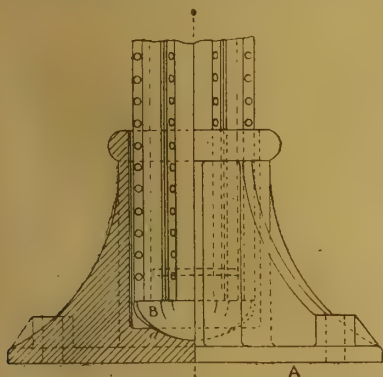


Fig. 92.

1875 to replace a trestle bridge of timber which was destroyed by fire, are built of corner towers and bracing. The towers lean transversely to the track, and are parallel in line with it. They are

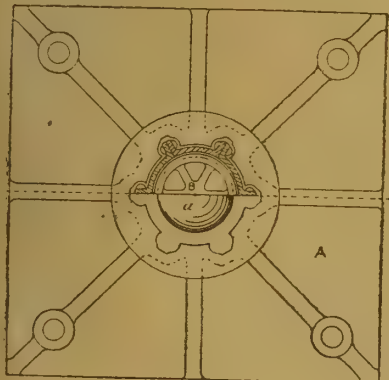


Fig. 93.

carried in cast-iron shoes and caps, and are made in 25ft. lengths. Fig. 91 shows the design employed for the pillars. They are formed of three plates, forming three sides of a rectangle, the

fourth side being occupied with a lacing of bars, leaving the interior free for painting. The angles are 4in. by 4in. by  $\frac{1}{2}$ in., and the plates 15in. wide and of variable thickness. The lengths are connected with tongues and pins.

Figs. 92, 93 illustrate the fitting of the bases of

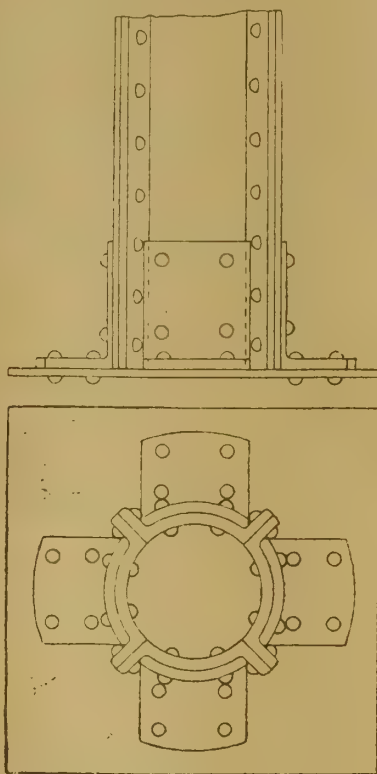


Fig. 94.

Phoenix columns used on some of the viaducts of the New York Elevated Railroad. The columns are fitted into cast-iron base-plates, A, cored out to receive the columns and flanges, with a moderate clearance. The right-hand of Fig. 92

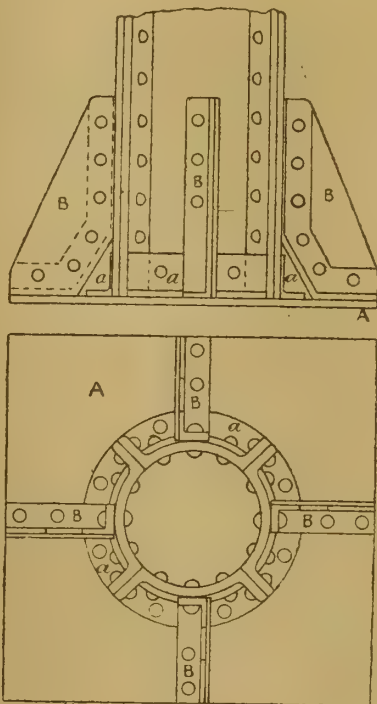


Fig. 95.

shows the base in external elevation, the left-hand in vertical section with the column in place. The upper part of Fig. 93 illustrates the column in section in the base, and the lower part the recessed portion of the base with the column removed. The bottom of the hole is made spherical at *a*, and a cast-iron spherical block B

made to fit the bottom is fitted to the under-side, of the column.

In England the square and angular sections are generally preferred to the Phoenix columns, because of the greater facility which the former afford for the making of attachments. Flat faces can only be provided in circular columns by bolting cast or forged blocks to them, and this is not so simple a matter as making attachments direct to the flat faces of the columns. The same remark applies in the main to the extensions for the bases and caps. In England, I think, the most usual method of bracketing a base or cap on these columns is by means of angles or of knees, Fig. 94, which have to be bent to the curvature of the column, and riveted to it and to the base. But these may sometimes be insufficient, and gusset brackets, as in Fig. 95, will afford greater rigidity. The angles *a* are riveted round to stiffen the bottom edges of the column, and the gusset brackets B are fitted to the column sides and to the plate A.

J. H.

#### A HOLIDAY IN HOLLAND.

WINTER has gone, spring is far spent, and summer, with its bright anticipations of a pleasant, and, let us hope, well-earned, holiday, is almost upon us. Before the remembrance of last year's vacation is put, like a read book, upon the shelf of one's mental library, a few notes may, perhaps, be usefully made here, proving at once a pleasant record, and may be a useful reference to some lucky traveller intending to go over the same ground during the coming season.

It was hard to realise last July, that although I had been in and out of Holland many times in the interim—twenty-one successive years had come and gone since last I visited Amsterdam itself. And so it came about that I determined to make the ever-attractive capital of our good-natured Dutch neighbours my centre during a month's wanderings, mainly amongst the little-known islands of the Zuyder Zee, and the almost as seldom visited province of Friesland in North Holland.

Of course, there are all sorts of ways of reaching Amsterdam. As time was, on this occasion, no object, the route chosen was by one of the Dutch steamers that leave the Tower Stairs, near London Bridge, about mid-day, twice every week, and by which a first-class return ticket costs the modest sum of 30s. A well served-up dinner on board, eaten somewhere about the mouth of the Thames, a pleasant evening, in company with a few equally pleasant passengers (none of them English), then to bed, and next morning there we were at the entrance to the North Sea Canal, off Ymuiden (Y-mouth), which said canal is a direct cut of some sixteen miles to Amsterdam. This great waterway, over 200 yards wide all through, and accommodating easily vessels drawing 23ft., is English work. It was cut full thirty years ago, at a cost, in round figures, of two million pounds sterling. Messrs. Lee and Sons, of Westminster, were the contractors. As we passed into the canal, two Dutch ironclads came out of it, the *Kortenaar* and *Piet Hein*, sister-ships, carrying twenty-one guns apiece. There was plenty of room to spare. The canal is almost straight, and continuous beds of withers, some 20ft. wide, grow on either side. These protect the banks from the wash, which, although steamers have to "slow down" to about five knots an hour, is yet considerable. Large docks are being constructed at Ymuiden, and as one approaches Amsterdam, near Zaandam, extensive military stores were seen building upon the banks, constructed of light brown brick with stone dressings—the latter, however, only very sparingly used. A contractor named Vissor, of Haarlem, appears, from the number of working barges, &c., we saw his name painted upon, to have the necessary repairs and additions to the canal in hand. The central spire of Haarlem's Cathedral is seen first to the south and then to the south-west, mostly all the time, till at last one reaches the Mersey-like River Y, and Amsterdam is seen on the other side, just as Liverpool is overlooked from Birkenhead. This used to be the finest view obtainable of one of Europe's most picturesque capitals, with its ten thousand and one high-pitched roofs and quaint gables, capping tall, odd-looking houses, most of them more or less out of the perpendicular; but not to any such extent as is the Leaning Tower at Pisa, or the almost equally out-of-plumb towers of Assinelle and Garisenda at Bologna. But, with the march



of civilisation, that never-once-seen-ever-to-be-forgotten prospect has gone the way of all flesh. Right in the front of everything, closely the river's side, the new Central Railway Station, with its huge unbroken roof, has been built. It is as much like the Manufactures Building at the World's Fair, Chicago, as anything I ever saw. That, too, in its turn, stands close by the Michigan Lake shore. Although the station does not wholly block, it greatly mars, the general view of Amsterdam. Further, it spoils the composition and scale of the picture, precisely as Brooklyn Bridge does that of New York, when seen from the deck of an "ocean greyhound" steaming up the Narrows of its fine harbour, with Europe and the grand Atlantic to rear. It was in this very river, right in front of Amsterdam, that, rather more than one hundred years ago, one of the oddest naval-military fights the world ever saw or heard of, took place. During the war with France the Dutch fleet was anchored here one winter—frozen in, in fact. Whilst in that position the ships were attacked by the French cavalry, who charged over the ice and captured them. How strange to picture the admiral giving orders to his amazed tars, through the speaking-trumpet, to "Prepare to receive cavalry"!

Reference was made just now to the ancient gables of Amsterdam. These, to my mind, not only in this city, but right through the lowland country, are amongst, if not its chief, charm. Their great variety is a continuous source of delight. I might have sketched over 200 different ones this last trip, all more or less piquant and quaint. A fortnight behind a camera in the older parts of Amsterdam, amongst these endless and ever-varying gables would, indeed, afford a grand opportunity for reaping a rich architectural harvest.

The excellent collection of architectural casts of old work recently placed in the National Museum (Rijk's), should on no account be missed by the visitor.

The building trade, especially in the suburbs, at Amsterdam seems very brisk. The principal erection in hand in the actual city is the new general post-office in Raadhuis-street, near to the palace, in the Dam. The latter, Dutchmen, as English people are supposed to do of Trafalgar-square, believe to be "the finest site in Europe." At the time of our visit the new post-office was up to the top of the large circular-headed windows of the ground floor. It is built of the small reddish bricks of the locality, with stone dressings, of somewhat blue tint. The contract is to be completed towards the end of next year. In the meanwhile, the *pro tem.* post-office is on an open space in the Dam Rak. It consists of a wretched set of wooden sheds, built up in one of the most prominent parts of the city. So disgusted are the good burghers themselves with it, that, we are informed, they will gladly give £100 to any enterprising individual who will "go in" for incendiarism, and burn it down!

The foundations in Amsterdam are as bad as can be. Everything is built upon piles. Where old houses are taken down, the basements are seen to consist of noisome, black, liquid mud. The water from this is drawn off by pumps on the Archimedean-screw principle, and long, strong piles are driven into the soft and yielding earth. The fact that all the houses in Amsterdam are built on piles is the foundation for the oft-quoted remark that its inhabitants, like birds, roost on the tops of trees!

The suburbs of Amsterdam are good houses, excellently built, much in the style of those in Paris and Brussels, growing up everywhere. Even as the great buildings at Chicago are built on piles, much as are the houses in Amsterdam, so Chicago and the latter city go greatly in the same way about matters when laying out their respective outskirts. In Holland, however, we do not find the inevitable elevated narrow wooden "sidewalk," which at Chicago seems to form the first stage of procedure when making a new street. The following is how whole districts are laid out at Amsterdam. The ground is first raised about 8ft. to form roadways across the marshy land—these roads running in parallel and cross lines. The sand to form them is "tipped" from waggons on rails, much in the way our own railway embankments are constructed. The roads once made, house plots are marked out, and upon these, good, and in many instances, splendid residences grow up. This is much the same sort of thing as occurred in London's south-west district in the late "40's" and early "50's." I am old enough

to remember when the purlieus of Westminster were pulled down. Then, what is now the roadway of Victoria-street, was built straight through everything, and entirely upon arches raised fully 12ft. from the original ground. After that the "carcasses" of some of the houses now there were built by (I think) the late "Georgey" Myers, or if not by that energetic and enterprising individual, by some equally well-known contractor of the period. They proved a poor speculation, and remained almost in as bad a condition for years as were for so long the Chancery ate-up houses at the Blackfriars' end of Stamford-street, S.E. It is just the same with the history of Pimlico; from the neighbourhood of Vauxhall-road (west and south-west) to the riverside opposite Battersea, in the Lupus-street district. As a boy I recollect when there were comparatively few houses thereabouts. The streets were simply raised roadways.

The parks outside Amsterdam are splendidly laid out; the landscape gardening is invariably admirable. Here again, in these public resorts, one is reminded more of the United States than of England.

Going back into the city again, we notice the fine pitch-pine poles used for telegraph centres at the corners of streets. They stand invariably 40ft. or so out of the ground, running up square the first 12ft. or so, then cut octagonal, and dying off round towards the top. On the other hand, go where you will upon buildings in course of construction, one never meets with a decent



FIG. 1.

ladder. As an illustration of the badness of foundations in Amsterdam, one may mention the abutments to the flanks of both ends of the new Central Railway station. They have sunk feet out of the perpendicular! Every practical eye in Amsterdam, or, for that matter, in



FIG. 2.

any Dutch city or town of importance, must spy out the excellence of the curbings to the pavements. These are worked in long, somewhat narrow lengths of bluish-grey limestone. Where corners have to be turned, these are cleverly masoned on the sweep, and sometimes on the



FIG. 3.

ogee. One thing is particularly noteworthy—the joints to the stones are never square. The section is generally like Fig. 1; but sometimes curved, as shown in Fig. 2; or cut at two angles, as in Fig. 3.

Put not your trust in guide-books! Cook's "Holland" (1895) says the English Church on the Groenburgwal "has recently been decorated with handsome Gothic oak carvings." As a matter of actual fact, some 15th-century tracery has been cut out of 3in. or 4in. oak boards with a fret-saw, and thus pieced, the stuff has been planted on to the ugly pew-ends. This work, to which visitors' attention is thus pointedly drawn, is hardly on a par with what a village school-class might be expected to do. The church itself is small, and contains a good old carved coat of (English) arms, in which the horse of Hanover occurs.

Not the least enjoyable way of spending a few weeks in this neighbourhood is to hire a yacht, and go at will here and there upon the placid Zuyder Sea, the Frisian Brooms, and from one to another of the old world islands. These cutters can be obtained at very reasonable terms: boats large enough to amply accommodate and sleep four to eight passengers at £8 to £10 a week, an expenditure which defrays all expenses (crew

included) save that of the actual provisions consumed by the party. Those who may think of availing themselves of this charming way of getting a restful holiday should write to Mr. C. Robinson, the British Vice-Consul, 183, Prins Hendrikkade, Amsterdam, who will gladly furnish all particulars.

And now, as we have talked enough for the time being, let us rest contented in Amsterdam at Schouter's Hotel van Gelder, 34, Damrak (we cannot do better!) until next week, when less frequented resorts in Holland shall be visited.

HARRY HEMS.

## THE SURVEYORS' INSTITUTION.

THE 29th annual general meeting of the institution was held at the temporary offices in Savoy-street on Monday last, when it was announced that Mr. C. Oakley, of 10, Waterloo-place, had been elected president for the ensuing year, and that the names of Mr. A. R. Stenning and Mr. A. Savill had been added to the list of the council, to fill the vacancies caused by the retirement in the ordinary course of Mr. Watney from the presidency and the death of Mr. A. Garrard. The council report for the year showed a very satisfactory state of affairs, the number of members having risen to 2,702—an increase of 112, and the financial position of the society remaining as stable as ever in spite of the necessarily increased expenditure due to the rebuilding. The number of candidates examined during the year was, for the preliminary examination, 133, of whom 91 passed; and for the professional examinations, 236, of whom 151 passed—a slightly lower percentage than last year. The council were able to report that progress was being made with the new buildings, which the contractor hoped to get roofed-in by the end of the present year.

During the meeting the prizes to successful candidates, consisting of sets of textbooks and of scientific instruments, were handed to the winners, and, after the usual vote of thanks, the adjournment of the meeting brought the session to a close.

## SANITARY SPECIALITIES.

MESSRS. ADAMS AND CO., engineers and sanitary specialists, of York Engineering Works, and Leeds, and Old Queen-street, Westminster, have issued a new edition of their sanitary lists. In addition to the various sanitary fittings, closets, baths, lavatory ranges, disconnecting chambers, siphons, tanks, &c., we must draw special attention to several new designs. Adams' patent automatic flushing latrine, is admirably adapted for large schools, factories, and offices. The pans are well separated, and are connected in series at any desired distance by 6in. sanitary pipes; each pan communicates directly with the drain through a trapped outlet, and at the other end is connected with the flush-tank. Each pan is dished; no wood casings are required, and the pan is self-flushing by a flushing-rim. The prices of this latrine are very moderate in glazed brown earthenware. On p. 8 we see Adams' "Automatic Siphonic Multiple closet," which is of similar construction, but the pans are carried on pedestals. The principal difference is the siphon outlet, the pans being untrapped. The pans are of brown glazed earthenware or made in straw and white, and the closet presents an ornamental appearance. They are flushed by the rims, and each has a back outlet, which is an advantage. The seats are of unvarnished pine or varnished pitch-pine, shaped to the pan. Architects would do well to specify this form for schools and offices. On page 100 is an illustration of Adams' complete "Epic" closet sets—a highly-glazed white earthenware closet, with special seats of mahogany, walnut, or teak, white earthenware cistern, brass chain-pull, and plated fittings—a most complete and sanitary closet arrangement, priced in two sets, £5 10s. 3d. and £7 13s. Another example of a complete closet set, with closet, cistern, seat, &c., is given on p. 25. Adams' patent "Helios" registered valve-closet is a new and improved form of valve-closet. It combines the advantages of a valve and the "wash-down" pedestal. The lead tray is dispensed with, and the whole is in one piece of highly glazed earthenware in pedestal form. The "Lumina" siphonic closet, p. 28, is a capital and cheap pattern for ordinary use. Amongst other illustrations of improved appliances we must mention



the patent "Epic" registered closet seat, which saves woodwork, and has a wall attachment, and flush pipe connection of much merit; the patent "Helios" lavatory range in glazed earthenware, an excellent range for public institutions, hotels, and schools, and of good shape, and fixed on glazed-ware pedestals; another pattern on brackets, and others of the tip-over kind, valveless lavatories, improved urinals, baths, washhouse tubs, Adams's patent slop or waste-water closet flusher, and self-contained earth closet, a very compact and useful closet of this class. The catalogue is well illustrated, and every architect and builder should have a copy.

#### ELECTRIC RAILWAYS AND TRAMWAYS.\*

A HANDSOMELY bound volume, dealing with electric railways, their construction and operation, by Mr. Philip Dawson, C.E., is on our desk; a revised and enlarged work which appeared in the pages of *Engineering*, in a series of articles on "Electric Traction." These articles form the basis of the present book, which has been brought up to date, and constitutes a valuable treatise on electric motive power applied to railways and tramways. Mr. Dawson is a gentleman well qualified for such a task; he has personally visited every city and representative plant of the United States and Europe, and with the assistance of Mr. James Dredge, of *Engineering*, he has been enabled to place before the engineering profession and managers and promoters of these works a valuable record of the machinery, plant, and apparatus of electric traction as it now exists. The advice he gives as to the conditions under which electric power is permissible or can be adopted will be read with much advantage. In the first chapter Mr. Dawson describes the early history and development of electric traction in America, and compares it with English lines; he next deals with the types of rails used, track construction in America and England, and other details like points and crossings, switches, curves, &c. Such matters as electrolytic action, the corrosive action in metallic pipes, and remedies to obviate this action are discussed. The one system of electrical traction used in America is the elevated conductor system, the conductor being suspended above each track for the whole length of line. Communication between the aerial wires and the car-motor is "maintained by means of an under-running grooved trolley-wheel mounted on a steel pole, and held at a constant pressure against the wire by springs in the base," the latter being placed centrally on the car roof. The method is fully illustrated by diagrams and photo-blocks. The method of erecting the trolley wire, span and bracket arms, the tubular poles of steel, and the various mechanical details are fully explained in the text, and formulae and tables for the strain on wire and on poles are given. There are upwards of 500 illustrations. The subject of motors and motor-trucks, car construction, wheels, and brakes are treated with much fulness of detail; trolleys, generators, switchboards, central stations, and the description of the chief railway companies in America, and the power stations are of interest. The British electric railways receive attention, the Dublin and Bristol electric tramways and their construction, the City and South London Electric Railway, Liverpool Overhead Railway, are amongst those described and illustrated. The statistical information and working expenses are most fully given, and the tables of American working expenses per car-mile ought to be of much interest to all engineers and promoters. So many factors determine the cost that it is difficult to form a hasty opinion; but these tables ought to enable just conclusions to be drawn. So far as tramways and light railways are concerned, Mr. Dawson thinks that electric traction will supersede every other kind of propulsion. When we consider that Denver, Minneapolis, Baltimore, Philadelphia, and other cities of the States are adopting the overhead wire system, and have thrown away enormous investments in cables, &c., the advantages of electricity over the cable as a mode of propulsion are obvious, one of the most important being the power of expansion at relatively small cost. We may add, the author is not

favourable to the open conduit or underground system; it is certainly more expensive and difficult to keep in repair.

#### STABLE CONSTRUCTION AND SANITATION.—XVII.\*

THE benches of dog-kennels should be designed to retain as little dirt and moisture as possible, whilst every part should be readily

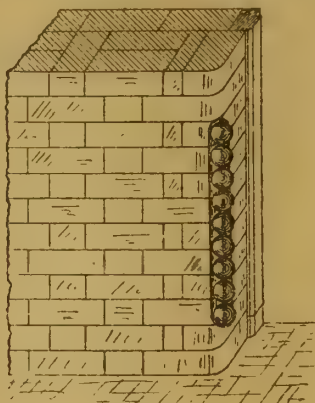


FIG. 182.

accessible for cleaning. They should be constructed of some hard and comparatively non-absorbent wood, such as oak or teak, rather than of deal or other soft wood.

A very simple and efficient arrangement of kennel-bench appeared some years ago in *The Field*, when a correspondent, writing under the nom-de-plume of "Lepus" gave a sketch of a bench as used by him (see Fig. 183) together with the following description, viz:—

"My benches are made of inch deal, cut into widths of 3in., and nailed ½in. apart to two transverse pieces, to which hinges are fixed to connect the bench with a board 6in. wide, fastened firmly to the wall about a foot from the ground. In front is a piece of board about 3in. in width, to keep the straw from drawing off with the hounds. To prevent the hounds from creeping under, I nail two long laths, the length of the bench, across in front of the legs, which are hung with hinges in front of the bench, so that when the bench is hooked back they fall

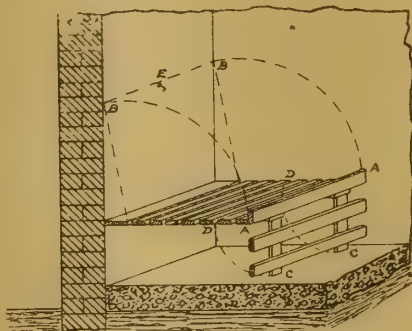


FIG. 183.

down and hang flat. By having the 6in. board between the hinges and the wall, it prevents the former from being strained when the bench is hooked back with straw upon it."

An improved form of bench—comprising both a day and night bench—may be obtained from manufacturers of kennel fittings. It is designed with a double floor or seat, and in most cases both the upper and lower seat are formed of open battens. The upper seat is made to fold up with the bedding, and is secured to the wall by hooks so that the straw may be kept quite clean and dry. During the day-time the dogs rest on the lower seat of the bench instead of on a cold concrete or brick floor, but the whole bench may be turned up in order to allow of the entire floor being thoroughly cleansed. At night the upper seat (together with the bedding) is turned down to provide a comfortable sleeping-place for the

dogs. Sometimes the walls of the boxes are boarded or rendered in cement to a height of 2ft. 6in. above the bench, instead of leaving the rough surface of the brickwork exposed at this point.

The boiling-house should be provided with a large boiler for cooking the food, and a good supply of hot and cold water should be available at any time. The feeding-room is fitted up with a long trough, in which is placed the dogs' food for each meal-time.

In front of the buildings a large courtyard is arranged, and finished with a paved or gravelled surface. This inclosure forms a convenient gathering-ground for the hounds, the various kennels having direct access thereto. A bath or washing-place for the dogs is also provided in the courtyard.

Kennels such as those just described are well adapted for hardy breeds of dogs, such as fox-hounds, harriers, &c.; but for greyhounds and other varieties of dogs which can only be brought to a high condition of health and speed by very careful attention and gentle nurture, it is necessary that the general arrangement of the buildings shall be slightly modified to suit the altered conditions. Amongst other minor matters, it is desirable that the paved runs should be entirely roofed-in, so that both the boxes and yards may be thoroughly protected from the weather. The runs can be cheaply covered in by using corrugated iron. The sides of the runs should, however, be finished with a dwarf wall and open iron railing in the usual manner, so that ample ventilation may be obtained.

#### AVERAGE COST.

Some knowledge of the average cost of the different classes of stables, cow-houses, is frequently of great service, more especially in the initial stage of preparing designs, which, when carried out, must not exceed a certain specified amount. Of course, the cost of erecting the same class of building will vary in different parts of the country, as the local circumstances of each place must materially affect the ultimate cost. For instance, whilst a stable of a certain description might be erected for £50 per stall in one part of the country, yet a precisely similar building may cost not less than £60 per stall in another locality.

The following items may, however, be useful for comparison as showing in broad and general terms the average cost of stable buildings of various descriptions, together with their accessories. Some of the prices given have already appeared in the *Building News*, and they are now reproduced by permission in order to make the list complete. The prices refer to brick buildings of a substantial character, and covered with slates, unless otherwise stated. In all cases where the average cost is given at per foot cube, it is assumed that the cubic contents of the building have been ascertained by taking the dimensions from out to out of walls, and from the bottom of the footings to half-way up the roof.

First-class stables, such as are erected for the best description of racing, hunting, or private establishments cost from £120 to £150 per horse. Where the accommodation consists almost entirely of loose-boxes, the cost will in some cases exceed the amount given.

Second-class stables, comprising those which are ordinarily attached to large town and country houses, well and substantially finished, may be erected for £70 to £90 per horse.

Third-class stables, intended to accommodate large numbers of horses, and provided with swing bails or plain stall partitions, as for tramway and omnibus co.'s, general carriers, &c., cost about £45 per horse.

Fourth-class stables, such as are generally provided for small hotel, livery, and hackney-purposes, cost about £40 per stall.

Fifth-class stables of the type usually erected for farmsteads, cost from £30 to £35 per stall.

Saddle and harness rooms cost from 6d. to 8d. per foot cube, according to the amount of finish given to the interior, and the class of fittings provided.

The average cost of a smithy, or forge and shoeing-shed, fitted complete, with bench, racks, vices, anvils, bellows, &c., may be taken at 6½d. per foot cube.

Coachhouses, stores for forage, and buildings of a similar character vary from 3d. to 5d. per foot cube, the exact value depending on the size of the rooms and the amount of finish required.

First-class cow-houses, provided with superior

\* Electric Railways and Tramways. By PHILIP DAWSON, C.E., M.I.E.E., Assoc. M. Inst. C.E., &c. London: Office of *Engineering*.

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iron fittings, &c., complete, cost from £25 to £30 per cow.

Second-class cow-houses, including iron fittings of a plain and substantial character, may be built for £20 per cow.

Third-class cow-houses, as for farm buildings, cost from £11 to £16 per cow.

As regards the average cost of cow-houses here given, the prices refer to buildings in which each stall is arranged to accommodate two cows.

The dimensions and details of construction of piggeries and kennels vary to such a large extent, and depend so much on local circumstances, that no general guide as to their average or comparative cost can be given.

The cost of providing and fixing stable fittings and accessories varies considerably, but chiefly on account of the general design and finish which may be required. The following prices may be taken as showing the approximate and comparative value, so far as it can be stated in general terms.

Iron stall-fittings of an ornamental character, for stables of the highest class, and comprising a stall partition with ventilating ramp, sliding barriers, enamelled manger fittings with safety front, hay-rack, pillar-chains, head-chain, &c., fixed complete, cost from £20 to £30 per set.

Plain but well-finished fittings, comprising iron sill and ventilating ramp, 1½ in. boarding, iron heel-post, manger, hay-rack, chains, &c., fixed complete, cost about £16 per stall. For stable building of an ordinary character, the price of the fittings average from £7 to £10 per stall, fixed complete.

Iron cowhouse fittings of the best class cost about £8 per cow, including iron heel-post and stall division, feeding-trough, fodder-rack, fastening-rods, chains, &c., fixed complete, and assuming that one stall division is provided to every two cows. Fittings of a similar but plainer type, such as are well adapted for ordinary buildings, average from £4 to £6 per cow, including fixing.

Concrete stable-paving 3 in. thick composed of clean granite chippings and Portland cement, grooved and laid complete to proper falls on, and including, a Portland cement concrete foundation 6 in. thick with 6 in. of broken brick rubbish under, costs about 10s. 6d. per yard super. The average price of paving with granite setts 6 in. deep on and including concrete foundations 6 in. thick, is 21s. 6d. per yard super. Paving with plain Dutch or adamantine clinkers on, and including, concrete foundation and brick rubbish as before, costs approximately 16s. per yard super. If the clinkers are formed and laid with bevelled edges or panels, then 1s. per yard super. must be added to the foregoing price. Blue Staffordshire chamfered stable bricks, 9 in. by 4½ in. by 3 in., laid complete with concrete foundations, &c., as already described, may be carried out for 11s. 6d. per yard super.

The price of wood-block paving, consisting of creosoted red deal blocks, 9 in. by 3 in. by 6 in., laid complete on 6 in. of cement concrete, with a bed of broken brick rubbish under, the joints being grouted with bitumen or cement and sand, is about 12s. 6d. per yard super.

It would occupy too much space, and also greatly exceed the limits of the subject as originally laid down for consideration in these articles, to enter into any further particulars respecting the average cost of stable accessories and sundries. Additional or more detailed information would more properly be obtained from manufacturers or firms engaged in carrying out work of this description, more especially as the local requirements or conditions would then be known, and due allowance could be made for them.

#### THE LANCASHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.

THE fourth half-yearly meeting of the association was held at the Bull Hotel, Burnley, on Tuesday, June 1. The President, Mr. Cunliffe, Bolton, was in the chair, and there was a large attendance of representatives from Accrington, Blackburn, Bolton, Bury, Burnley, Chorley, Colne, Ashton, Stalybridge, Oldham, Warrington, Longridge, Preston, Rochdale, Brierfield, &c.

The secretary's report stated that one local association at Warrington had joined during the half year; but as two of their smaller bodies had become for a time disorganised, the strength of the Federation remained about the same as before. The relations with the operatives were reviewed at some length, the disputes of Chorley, Colne,

Blackpool, Preston, &c., were dealt with, and a detailed account given of the action taken with reference to the numerous demands throughout the country for advances in wages or alterations in the working rules.

The report was adopted, and ordered to be printed and circulated. The treasurer's accounts, which showed a large balance in favour of the federation, were presented, and the balance-sheet approved.

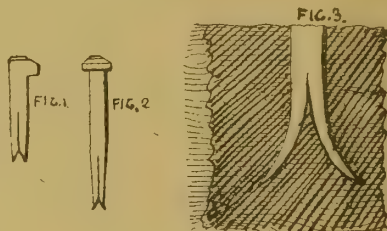
Mr. James Storrs, of Stalybridge, was unanimously elected president of the association for the ensuing year; Mr. W. Cunliffe, Bolton, was elected vice-president; Mr. J. H. Thompson, Bury, hon. treasurer; and Messrs. W. Shepherd, Rochdale, and J. Tinline, Bury, hon. auditors. The secretary, Mr. John Tomlinson, 11, Cross-street, Preston, whose two years' term of office expired, was unanimously re-elected for a similar period, there being no other nomination.

The New Employers' Liability Bill was considered, and in view of its provisions, which seem likely to become law, it was deemed advisable that the executive should take into consideration the best means of protecting the members, either by the formation of an Accident Insurance Company on mutual lines, or by endeavouring to obtain more favourable terms for federated employers.

A long discussion took place on the anomalies in the operative masons' trade rules in the different towns respecting sawn and ready-worked stone, and ultimately, on the motion of Mr. Parker, Longridge, seconded by Mr. G. Smith, Burnley, it was decided to test the feeling on the subject by a vote of the federated employers, and leave it to the executive to act in accordance therewith.

#### THE FENDERL NAIL.

THE principle of the Fenderl Nail, which is coming into use on the Austrian, Austro-Hungarian, Servian, and Bosnian railways, is



applicable to almost every description of nail, spike, cleat, clamp, or other metallic fixture employed for the purpose of solidly and permanently fastening together two or more pieces of wood or the component parts of timber structures upon any scale of magnitude. Had we even the space at our disposal, it would be quite unnecessary to either describe or illustrate the numerous forms of which this nail is susceptible. The couple of examples accompanying the present article will fully explain the advantages claimed for the modifications introduced by M. Fenderl, although we do not endorse them all, as will be seen. A part of the shank of the nail or spike is split at the lower extremity, the inner edges of the cut bevelled, and the whole appearance of the modification closely resembles the tail of a swallow. As the nail is driven in by the ordinary operation of hitting it with a hammer on the head, the swallow-tail pointed extremity spreads out, as shown in Fig. 3. The amount of spread or the additional grip gained by this nail over those of the solid-shank type will depend partly upon the quality of the timber into which it is driven, and, what is a great deal more to the purpose, partly upon the quality of the iron of which the nail or spike is made. No cast-iron nails, of which there are plenty in the market, need apply, for they could not for a moment be employed in the application of this principle. Possessing no ductility or pliability, they would go to pieces before they had got an inch into the wood, notwithstanding the preliminary hole bored in the timber to facilitate their penetration. It will be conceded, after an inspection of Fig. 3, that the modified form of nail does possess a greater grip of the wood when once down, and that its powers of resistance against being drawn out again are superior to those of the usually-employed type. Whether this latter

property is an unmitigated advantage is possibly open to question.

The manner in which the nail with a split shank behaves when driven into wood is shown in Fig. 3: according to the hardness of the wood and the quality of the iron, so will the separated points be more or less distorted. In very hard timber they frequently become twisted into complete spirals. Combined with its greater holding power, the Fenderl nail cannot become loosened or shaky, either from the effect of blows, dry rot, or natural desiccation. It can also be used in any position and also in any direction, quite irrespectively of the physical position of the fibres or grain of the wood. It will hold equally well lengthwise, crosswise, and endwise; does not tear the timber, as might be supposed, and although when drawn the points are still a little separated, they can be closed up by a few blows of a hammer and the nail used over again. At the same time one does not always want to drive in nails, spikes, and holdfasts which are not merely very difficult to extract, but, as in the present instance, require the services of a special tool to get them out again. We speak from a somewhat unpleasant experience when we were once engaged in constructing a long timber river or dock wall. It was necessary to fix on the levelled heads of the piles a heavy coping of whole balks of exceptionally large scantling, 16 in. by 12 in. There are probably very few positions in which timber is exposed to so much hard usage as in the one mentioned. Great blundering barges and boats are incessantly doing their utmost to knock it to pieces, huge masses of stone and metal are hurled violently and recklessly upon it, and ropes, chains, and the shackles and hooks of lifting cranes are continually getting foul of it and endeavouring to tear it from its place. Under these circumstances it was deemed advisable to hold the coping down with jagged spikes, which answered the purpose very well until the time arrived for replacing the coping by fresh timber. Not only was it a task of considerable trouble and labour to get the spikes out, but when that operation was accomplished the timber was so torn, cut up, and generally irretrievably damaged and injured, that it was fit for nothing else but firewood.

T. C.

#### THE CAUSE AND CURE OF DAMP WALLS.

WE have received the fifth edition of Messrs. N. C. Szerelmey and Co.'s little pamphlet "On the Cause and Cure of Damp and Decay in Masonry," which ought to be read by everybody who has any care for the dryness and durability of their houses or buildings. The causes which give rise to dampness and decay in stone and brick walls are often misunderstood by people: they fancy there is no other cause but rain or a porous wall, and have little idea damp can be produced by changing the temperature, and that the air always contains water, and that where the moisture present is greater than the air can hold, dampness is caused. These simple facts are illustrated by two easy experiments in Messrs. Szerelmey's book. The presence of damp explains decay as introducing chemical agents like sulphuric acid. Our readers are no doubt acquainted with the value of Szerelmey's stone liquid. The compositions of the older Szerelmey process are attested by witnesses of high repute, like Professor Faraday, D.C.L., Sir Roderick Murchison, F.R.S., Sir Charles Barry, and others. The experience gained has led to the new process now in use, and the reports published speak for themselves. These describe treatments of damp walls of brick and roughcast twenty-two years ago, which are still exempt from damp; houses of freestone in exposed seaside situations which have, since the application of the Stone Liquid, been proof against damp for over twenty years; brick and cement houses, formerly saturated after rain, which now resist the heaviest downpour. Other reports speak of the satisfactory treatment by the Stone Liquid of old decayed stonework, brick and plaster walls, waterproofing chimney-stacks. The appendix contains much useful information as to the application of the Stone Liquid, which should be first stirred up and then rubbed in. Three coats are desirable, and one gallon is sufficient for treating 25 square yards. The Szerelmey iron paints have been found valuable in resisting the corrosion of iron, and numerous reports are added of its value as an anti-oxide composition.



## BOOKS RECEIVED.

*Plumbing*, a textbook, by WILLIAM PATON BUCHAN, R.P. sanitary engineer, &c. Seventh edition. Re-written and enlarged (London: Crosby Lockwood and Son).—This is a new and enlarged edition of an old and well-known handbook on plumbing by the late Mr. Buchan, who was a practical writer on sanitary engineering in this journal. In fact, this book gives in enlarged and revised form a series of articles on plumbing which appeared in 1871 in the *BUILDING NEWS*. Since that time the subject has been largely discussed and developed. This edition of Mr. Buchan's book was prepared for the Press a few months before the author's lamented death, the proof sheets having actually been passed by him. The demand for a revised edition, incorporating in its proper place the added matter of previous editions, and also the many improvements and appliances on sanitary plumbing, have led the publishers to bring out this new and greatly enlarged volume, which is illustrated by 170 new drawings, in addition to the old ones. All plumbers and plumbing students should buy this new volume.

—*Metrical Tables for Engineers, Surveyors, &c.*, by FREDERIC ELIE GAY, Assistant City Surveyor, Bath (London: The St. Bride's Press, Ltd.), is a very handy and useful collection of metrical tables which will be found of value by all architects, surveyors, engineers, chemists, and others who often have to transpose into our system foreign values. These tables enable anyone to rapidly and accurately transpose any value they require. Thus we have tables of millimetres into  $\frac{1}{16}$  in., and the inverse. These are arranged in pairs; the number in one column is reciprocal to that opposite the same unit in the column. Other pairs of tables give millimetres into inches, and the inverse; metres into feet, and feet into metres; metres into poles and chains, kilometres into miles, and centimetres into square inches, and the reverse; metres into square feet, &c., and so on through the whole of weights and measures, with examples to each case. We can highly recommend Mr. Gay's little book to all professional men and students.—*Beaton's Pocket Technical Guide, Measurer, and Estimator*, by A. C. BEATON, eighth edition, revised (London: Crosby Lockwood and Son), is a new and revised edition of a very useful little pocket-book, small enough for the waistcoat pocket. Directions for measuring the building trades' work, estimating the various parts of a building collectively, and making specifications, will be found in this little book. Those who want to make rough and rapid estimates for building or additions will find this little guide of service.—*Europe Illustrated*. No. 171-2 of this series of shilling illustrated handbooks (published by the Art Institute, Orell Füssli, of Zurich) deals with *Meyringen and its Environs*. It is written by OTTO JOSSI, and illustrated with 17 sketches by J. Weber and a map of the scenery in the Hasli Valley, one of the loveliest and quietest centres in Switzerland for tourists.

The Roman Catholics of Bridgnorth, having purchased the old Bridgnorth and South Shropshire Infirmary, have converted it into a convent chapel. The convent was dedicated on Friday, and was named the Convent of St. Joseph.

The eighth annual Southwark and Lambeth free loan picture exhibition was opened by Mr. David Murray, A.R.A., on Saturday afternoon at the Borough Polytechnic, Southwark. Mr. D. Brynmor Jones, M.P., presided at the opening ceremony. The collection, which will remain open until the 18th inst., includes Mr. G. F. Watts's "A Tormentor," "Escaped," and "Birth of Eve," Mr. Alma-Tadema's "A Question," Mr. W. L. Wyllie's "Workaday England," and pictures by Mr. G. C. Horsley, R.A., Mr. David Murray, A.R.A., Mr. E. M. Ward, R.A., Mr. J. B. Burgess, R.A., Mr. Arthur Hacker, A.R.A., Mr. F. Walton, R.I., Mr. Edwin Hayes, R.I., Mr. H. S. Marks, R.A., and Mrs. H. M. Stanley.

The question of lighting the public buildings of Handsworth by electricity was raised on Friday, when Colonel W. Langton Coke, M.Inst. C.E., held a Local Government inquiry at the Council House, Handsworth, into the application of the district council for permission to borrow £2,200 for that purpose. Mr. H. Ward, clerk, explained that the loan of £2,200 which was being applied for was for the purpose of providing electric light for the council house, library, lecture halls, stabling, fire station, and the new technical schools. Evidence as to the details of the buildings and plant was then given by Mr. W. Henman, of Birmingham, the architect, and Mr. Vaudrey, M.Inst. C.E.

## OBITUARY.

MR. J. G. POOLE, formerly borough surveyor of Southampton, and afterwards engineer to the Harbour Trust, died at an advanced age last week, and was buried in Southampton Cemetery on Saturday. During his illness his work has been carried on by one of his sons, Mr. Edward Cooper Poole, who, as deputy for his father, has designed and carried out some important works for the Harbour Board, notably the new Royal Pier (in conjunction with Mr. James Lemon, C.E.), and pavilion and other erections thereon, and the Town Quay extension. The late Mr. Poole was twice married, and leaves a large family of sons and daughters, who, however, are all grown up. One of his sons, who has been absent from England for 15 years, holding a Colonial appointment in Western Australia, returned home recently on six months' leave, and was present at his father's death.

## CHIPS.

The Building Act Committee reported to the London County Council on Tuesday, the receipt of 496 applications for licenses in respect of temporary structures for the accommodation of persons desiring to see the Jubilee procession. Of these, 328 had been granted, and 33 refused, while the remainder were still under consideration.

The foundation-stone of new Turkish baths were laid at Exeter on the 27th May, on a site adjoining the Rougemont Hotel. The building is being erected from plans by Messrs. Octavius Ralling, M.S.A., and Lewis Tonar, of Exeter, joint architects. Mr. William Wadman, of the same city, is the builder.

Major-General H. D. Crozier, R.E., sat on Tuesday week at Teignmouth Town Hall, for the purpose of inquiring into applications made by the urban district council to the Local Government Board, for sanction to the borrowing of £7,500 for gaswork purposes, £7,500 for works of water supply, £1,000 for purposes of public walks and pleasure grounds, and £120 for purposes of sewerage.

The Lerwick Burgh Commissioners have resolved to accept the tender of Messrs. D. Macdonald and Sons, Hawick, for the construction of a new system of waterworks for the town, to include the laying of a new 6 in. main, improved filtering tanks, &c. The total cost of the works will be between £4,000 and £5,000.

At the sale of the first portion of the pictures and water-colour drawings belonging to the late Sir John Pender, on Saturday, 101 were disposed of, and realised £75,753. Of this total, more than £30,000 was paid for works by Turner, which had cost the late owner about £8,000. The famous picture by John Phillip, R.A., "La Gloria: a Spanish Wake," on which the artist elected to base his reputation, was purchased at 5,000 guineas for the National Gallery of Scotland. The work formerly known as "A Spanish Wake" measures 56 in. by 85 in. The total sum realised by the three days' sale of the Pender collection was £81,323.

The inaugural ceremony of laying the foundation stone of the new Royal York Theatre of Varieties at Southampton took place on Wednesday week. The new hall will be 60 ft. in width, and will have seating accommodation for 2,200 people. Mr. Walter Emden, J.P., L.C.C., V.P.S.A., is the architect, and the contractors are Messrs. Beer and Gash.

In excavating the foundations for some new buildings for the School of Science in the city of Gloucester, the substructure of an ancient Roman wall has been uncovered for a distance of 150 ft. Four courses of massive oolite blocks from the Cotswolds have been brought to light, showing the original wall to have been of great strength, with a probable height of 25 ft.

The returns for last week at the Tokenhouse-yard mart show that it was a record one, the total of £397,719 being such as has not been achieved for some years past, and, indeed, more than £60,000 more than was realised in any week during 1896. Among the sales effected was a small site of 734 ft. in Lombard-street, forming part of the well-known post-office, including a mortgage, realised about £41 per foot, or £30,100, the adjoining owners, the Guardian Assurance Company, being the purchasers; and a freehold residence with stabling in Abingdon-street, Westminster, with an area of 3,320, brought £12,800.

A drinking-fountain, erected in the gardens of the Victoria Embankment, opposite the offices of the London School Board, was unveiled on Saturday by Lady Henry Somerset. It is called "The Child's Fountain," and is the gift of the Temperance children of England to London. The fountain is a replica of one set up in Chicago by the children of that city. On a grey granite base is the figure of a child with outstretched arms holding a cup.

## Engineering Notes.

THE BUDLEIGH-SALTERTON RAILWAY.—This railway has just been formally opened. The line is  $6\frac{1}{2}$  miles in length, and commences by a junction with the Sidmouth branch of the South-Western Company's system at Tipton St. John's. For about five miles it passes along the valley of the river Otter, which it crosses three times by wrought-iron bridges. The first station is at Budleigh,  $4\frac{1}{2}$  miles from Tipton, and it has ample siding and goods-yard accommodation for general traffic and cattle. Goods sidings have also been made at Newton Poppleford and Colaton Raleigh, which lie between Tipton and Budleigh. Eventually there will be a passenger station at Newton Poppleford. The terminal station is at Budleigh-Salterton. By this new route to Budleigh-Salterton 18 miles are saved on the journey from London, passengers being conveyed throughout by railway *via* Sidmouth Junction instead of, as hitherto, *via* Exeter to Exmouth and then by omnibus for six miles. It is anticipated that the line will eventually be extended to Exmouth, by which means a circular railway will be formed from Exeter through Sidmouth Junction, Salterton, and Exmouth. The engineer was Mr. William Clarke, M.Inst. C.E., and the contractor Mr. John Aird, M.P., who completed the line some four months under the contract time. The line has cost about £60,000.

PLYMOUTH.—Preliminary to more extensive improvements which the Great Western directors contemplate carrying out at their docks at Plymouth plans have been prepared by the engineers of the company for the extension and enlargement of the baggage warehouse and the construction of a platform near the piers at Millbay for the use of ocean passengers landing at the port and elsewhere. It is intended to more than double the warehouse in length by the erection of a new wing on a site now occupied by a foundry and boatbuilding yard. The new structure will be 245 ft. long, increasing the total length of the block to 425 ft. The old portion of the warehouse will be widened to 90 ft., and the new building will be of corresponding width. The entire block will be two stories high. The scheme provides for the construction of a short branch railway into the warehouse from Millbay.

The Allan steamship *Assyrian*, which left Liverpool last Saturday for Newfoundland, had as part cargo a large consignment of carved Devonshire oak from the studios of Messrs. Harry Hems and Sons, of Exeter, destined for the choir of St. John's Cathedral on that island, the fabric of which is now being rebuilt after total destruction by fire a few years ago. The work of making the choir fittings is being executed in Exeter by sections, and the present consignment consists, in the main, of clergy seats and desks. They are, like the building itself, in the 14th-century style, and have been designed by Mr. John Oldrid Scott.

Colonel W. L. Coke, on behalf of the Local Government Board, held and inquiry at Wednesday, on Friday, with respect to an application by the urban district council for leave to borrow £7,500 for sewerage works. The clerk to the council stated that Mr. R. E. M. Berrington, of Wolverhampton, had prepared a scheme, which it was estimated would cost £7,500, and the council had entered into a provisional agreement to purchase land for sewerage and irrigation purposes. There was no opposition to the proposal.

At Friday's meeting of the Ripon Board of Guardians, resolutions were passed approving of the erection of an infirmary for the workhouse, plans for which have already been sanctioned by the Local Government Board, at a cost of £2,650. The building committee recommended that Mr. F. H. Hargrave, the architect, be also clerk of the works, and that he be paid £175 as fees for the whole work. Mr. Kennedy, Local Government Board Inspector, said he always understood that there should be a practical man as clerk of the works. The Board resolved to have a separate clerk of the works, and after some discussion fixed the amount of Mr. Hargrave's fees as architect at £155.

In the rooms of the Royal Archaeological Institute, 20, Hanover-square, there is on view a collection of prehistoric flint instruments which Mr. H. W. Seton-Karr discovered in the Eastern Desert of Egypt last November, with the assistance of Johnson Pasha and the Beduins, and which he believes to come from the long-lost flint-mines of Egypt. The collection includes also a number of specimens of what Mr. Seton-Karr considers to be the most perfectly preserved palaeoliths hitherto discovered.



## Building Intelligence.

**BUTTERSEX.** Important additions have just been made to the new parish church of St. Luke, Thurlough-road, midway between Wandsworth and Clapham Commons. The eastern portion of the church was built at a cost of about £5,000. Later on the nave was erected, in 1881-5, at an expense of between £3,000 and £4,000. The tower, which cost over £1,200, was built a while after, and the completed edifice was consecrated by the Bishop of Rochester on All Saints Day in 1892. In 1894 an alabaster and marble screen was added, and the year following the walls of the apse were decorated. On the Feast of St. Simon Stock the new choir fittings, all of carved oak, were dedicated. The whole of the additions have been designed by the architect of the church, Mr. William White, F.S.A., of 30A, Wimpole-street, W. They embrace choir stalls for the officiating clergy, some three dozen singing men and twenty-four boys. The fronts of these are pierced with quatrefoiled panels, and the standards are carved with conventional foliage of early type. The clergy seats have carved elbows and are canopied. Sedilæ have been fixed on the south side of the building. These accommodate three priests, and are canopied and gabled, and have crocketed pinnacles rising between each gable. A bishop's throne has been fixed on the north side, and is 12ft. high. It is canopied, and the gables of the baldachino are enriched by crockets and finials. The north and south parclose screens like all the rest of the new additions are in English oak; they rise from the back rail of the stalls, and are surmounted by carved pierced crestings. These additions to St. Luke's have been carried out by Messrs. Harry Hems and Sons, of Exeter. A new boundary wall, surmounted by iron rails, has taken the place of the former wooden fence. The total expenditure of the new works has been about £1,000.

**CANTERBURY CATHEDRAL.**—The Prince and Princess of Wales took a leading part on Saturday in the reopening services at the Chapter House of Canterbury Cathedral, the first completed section of the movement for the restoration of the entire fabric, towards which Dean Farrar has collected upwards of £15,000. The Chapter House was rebuilt in 1304 by Lord Prior Henry, of Eastry, to whom is due all the work below the line of the arcading. It was completed about 1400 by Prior Chillenden. It has now been restored under the direction of Sir Arthur W. Blomfield, A.R.A., the architect to the Dean and Chapter, and the panelled ceiling has been redecorated in the original style, gilding being freely employed. The windows on the north side were always panelled as they are now, for they formed the southern wall of the great dormitory of the monks. Those on the south side, which had been plastered up, have now been reopened and reglazed. To Prior Chillenden are also due the great eastern and western windows, with their quadruple tiers of stained glass, of which the eastern, having been destroyed in the Puritan epoch, has now been refilled with stained glass by Mr. A. O. Hemming, of Margaret-street, W. It represents the figures and symbols of all who have been most famous in the cathedral history, from Queen Bertha to Queen Victoria, and from Archbishop St. Augustine to Archbishop Benson.

**CITY-ROAD, N.**—The Prince of Wales, accompanied by the Princess and the Princess Victoria of Wales, visited the City-road on Friday for the purpose of laying the foundation-stone of the new buildings of the Royal London Ophthalmic Hospital. The buildings will, when completed, comprise three blocks, one of which will face the City-road, and the second Peerless-street, while the third will lie between the two. The hospital will also have a small frontage in Cayton-street. The style is a free adaptation of Italian, and the frontages are carried out in brick and Portland stone. The plans have been prepared by Messrs. Keith D. Young and Hall, of Southampton-street, Mr. Bedells, the surveyor of the hospital, acting in conjunction with them in the supervision of the work. The contractor is Mr. Grover. The whole of the floors are fireproof, on the Fawcett system, and all the constructional iron and steel work is being supplied and fixed by Messrs. Mark Fawcett and Co., of Queen Anne's Gate, Westminster, S.W.

**DOVER-STREET, W.**—Batt's hotel has been recently undergoing extensive alteration and

renovation. In place of a stable and other out-buildings in the rear, a dining-room, kitchen, and service-rooms have been built. Messrs. Hilder and Edge, of Great Pulteney-street, have carried out this work, including the redecoration of the whole of the building. The following specialists have also been employed:—Messrs. Smith and Stevens have supplied passenger and dinner lifts; Messrs. Dent and Hellyer have fitted up entirely new sanitary fittings throughout, and have laid a new system of drainage; electric lighting has been installed by Messrs. Laing, Whar-ton, and Down; electric bells and telephones by Mr. C. E. Zimdars; and hot-water, cooking and heating apparatus by Messrs. Charles Heap and Co. Mr. Robert Griggs, 11, Gray's Inn-square, W.C., is the architect.

**EMBANKMENT.**—The Guildhall School of Music is about to be enlarged at a cost of £20,000 from plans prepared by the City Surveyor, Mr. Andrew Murray. The additional land to be covered has an area of 3,700ft. super. and is 72ft. by 51ft. The ground and first floors of the new building will be occupied by an orchestral saloon, extending to nearly the whole space, with a maximum height of 30ft., and affording seating accommodation for 650 persons. The stage will be 47ft. by 14ft., and 27ft. high. In the basement there will be a number of dressing-rooms in connection with the stage. The number of classrooms will be 30, but as three of the classrooms in the present building are required for access to the new wing, the net gain will be 27 rooms. Emergency exits, 4ft. wide, are provided on each side of the saloon, three doors discharging directly on to John Carpenter-street, and at the level of the pavement, and one into the girls' school by means of a gangway. The gallery is provided with two emergency exits. No open fireplaces will be allowed, the building being heated throughout by hot air, while all the floors will be fire-resisting. The walls to the rear will be faced with white glazed bricks, and the front with Portland stone. The style of architecture adopted will be somewhat similar to that of the present building, but, owing to the greater height, the detail will be bolder, and the piers and pilasters presented in greater relief. Eventually the present building will be raised another story, and with a continuation of the mansard roof of the new extension. When that is done—perhaps before—the principal entrance to the school will be made in John Carpenter-street. The foundation-stone of the extension will be laid in July.

**LITTLEBOROUGH.**—The first building erected by this school board, to be known as the Summit School, was opened on the 20th May. Messrs. Butterworth and Duncan were the architects. The school has been planned as a central hall School, to accommodate 426 scholars; but at present provision has been made for only 246 scholars; 90 will be accommodated in what will become the central hall, now the principal school-room, two classrooms for 48 scholars each, and an infants' room for 69 scholars. To save expense and alterations in the future, cloakroom and lavatory accommodation has been provided for the completed school. The classrooms are lighted from the left by mullioned and transomed windows, five lights wide and two lights high, carried well up to the ceilings. The schoolroom is lighted from the front by a window five lights wide and three lights high, and on each side of the same there is a two-light window. A covered playground is provided under the centre part of the school, with arched openings to the south on the playground level. The schools are built with pitch-faced parapets, and the floors are laid with wood blocks. The contractors are Messrs. Preston and Dryland, of Littleborough.

**TRURO CATHEDRAL.**—The work in connection with the building of the foundations of the nave of the cathedral was formally inaugurated on Thursday afternoon in last week, the 17th anniversary of the foundation of the edifice. A short service—attended by several of the clergy, the cathedral choir, and others—was held within the inclosure at the west end of the cathedral, and the first sod in connection with the new work was turned by Mr. A. P. Nix, treasurer of the cathedral fund. Permission has been given by the city authorities for the erection of a hoarding around the site of the nave, and the demolition of the house in the High Cross, now occupied by the Misses Holland, will shortly take place. The works will be carried out, as were those of the choir and transept, from the plans of Mr. J. L. Pearson, R.A.

**WALTON, LIVERPOOL.**—The church of St. John the Evangelist, Rice-lane, Walton, was formally reopened by the Bishop of Liverpool on Monday after the completion of the west end of the building at a total cost of £3,500. The addition consists of the elongation by 25ft. of the nave and aisles, and the construction of a new west front in lieu of a former unsightly brick wall. The principal contractors for the work were Messrs. Lewis and Sons, of Blackburn, with Messrs. Paterson and Son, of Liverpool, for the joiners' work. The architect was Mr. C. E. Deacon, of Liverpool.

**WINTON, BOURNEMOUTH.**—The foundation-stone of the proposed new church at Winton, which will be situated in the parish of St. John's, Moordown, was laid on Thursday afternoon in last week. The site is a corner one, bounded on the west by the Wimborne-road (immediately beyond the Bournemouth borough boundary). The church is cruciform in plan, comprising a nave of five bays (83ft. long by 25ft. wide), with a clerestory. The nave has north and south aisles, and there will be five porches with double doors. The building is to be faced externally with local red facing bricks, and the window tracery, coping, and buttresses are to be executed with Bath and Portland stone. The church is of simple design, is Late Decorated in style, and will, when completed, provide seating accommodation for about 600 persons. The work is being carried out by Messrs. F. Hoare and Son, of Bournemouth, from designs, and under the supervision of Messrs. Creeke, Gifford, and Oakley, architects. The cost of the first part of the building will be about £3,000, and the contract is to be completed by February next.

### CHIPS.

An inquiry has been held at Grays by Colonel J. T. Marsh, R.E., with respect to the application of the urban district council for permission to borrow £4,100 for various works of street improvement and widening. At the last meeting of the council it was decided to purchase ten acres of land for the purpose of a recreation ground.

Balgriffen Park, the residence of Major Doyné, situate between Raheny and Malahide, in North County Dublin, was totally destroyed by fire on Tuesday night. The house was one of the oldest in the northern part of County Dublin, and the work was of exceptionally heavy construction, the floors being of 3in. planking and the beams of pitch-pine. Balgriffen is the estate conferred by Henry VIII. on Conn Bacach O'Neill. Along with the estate O'Neill received the title of Earl of Tyrone. Both the earldom and the estate ultimately fell to the celebrated Hugh O'Neill, Earl of Tyrone.

It is announced that the firm of Aldam Heaton, lately constituted as a limited company, is to extend the business, so long carried on in Bloomsbury-street, by opening new premises as show-rooms for exhibition of designs and decorative furnishing work. This branch establishment will be opened on or about the 10th of June next, at 89, Mount-street, Grosvenor-square.

At a recent meeting of the building committee of the Schools of St. John the Divine, Clapham Rise, S.W., it was decided to build new boys' and girls' schools in place of the existing ones, and Mr. Philip A. Robson, A.R.I.B.A., of Bridge-street, Westminster, was authorised to prepare plans at the earliest possible date. The building is intended as a commemoration of the Jubilee, and the new site, which is next the present infant school, is at the corner of Union-road and Gaskell-street.

The Dominion Government and the Canadian Pacific Railway have reached an agreement for the construction of a railway by the company through Crow's Nest Pass in the Rocky Mountains to tap the rapidly developing mining districts of Southern British Columbia. For a bonus of 11,000dol. a mile the company will build this year the 330 miles of railway from Lethbridge, North-West Territories, to Nelson, British Columbia.

Proof was heard in Glasgow Sheriff Court on Tuesday, in the action by the Rev. John White and the managers of Shettleston Parish Church against the heritors of the parish to ordain them to take down and rebuild the church, the present building, it is alleged, being in a decayed condition. The church is 146 years old. Mr. R. A. Bryden, architect, Glasgow, stated that the building was in an unsafe condition for the use of the public. All the walls showed signs of damage. Reconstruction, in his opinion, would cost about £2,324; and the erection of a similar church, providing similar accommodation, about £2,916. It would be foolish to attempt to repair the existing building, and a new church should be built. After further evidence the diet was adjourned.



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## ILLUSTRATIONS.

THE SURVEYORS' INSTITUTION.—NATIONAL SILVER MEDAL SKETCHES IN TEWKESBURY.—HOUSE AT PUTTENHAM.—GATESHEAD UNION COTTAGE HOMES.—NATIONAL SILVER MEDAL DESIGNS FOR COAL-BOXES.—HOUSE AT LIGHTCLIFFE.—PAIR OF HOUSES AT SKEGNESS.—ITALIAN CABINET BELONGING TO THE LATE SIR JOHN MILLAIS.

## Our Illustrations.

THE SURVEYORS' INSTITUTION, GREAT GEORGE STREET, S.W.

MR. ALFRED WATERHOUSE'S sole contribution to the Architectural Room of the Royal Academy this year is his autograph drawing of this building, now in course of erection in Great George-street, at Westminster, from his designs. This water-colour we to-day reproduce among our lithographic plates. An outline view, with plans, appeared in the BUILDING NEWS for January 1st this year. The contractors are Messrs. Foster and Dicksee, of Rugby.

## SKETCHES AT TEWKESBURY.

WE reproduce eight sketches of half-timber houses, carved oak lintels, a gateway in local stone, and a Jacobean tomb, from the picturesque town of Tewkesbury. For these drawings Mr. John D. Walker was recently awarded the National Silver Medal.

## HOUSE AT PUTTENHAM.

"MERLSHANGER," near Guildford, for Mr. Julian Sturgis, is to be built on the south side of the Hog's Back, three miles from Guildford, in brick, roughcast and whitewashed, with green slate roof, Portland stone dressings, and iron casements. Mr. E. C. Hughes, of Wokingham, is the builder, and Mr. C. F. A. Voysey the architect. Our illustration is from Mr. Howard Gaye's water-colour now at the Royal Academy.

## COTTAGE HOMES, GATESHEAD UNION.

TO-DAY we complete our series of illustrations of the selected designs for these cottage homes, for which Mr. Cecil A. Sharpe, of Fenchurch-street, E.C., is the architect. The accompanying plate includes the isolation hospital, the porter's lodge, and the receiving wards block. Their plans will be found in our issue for April 30th, when we gave a description of the whole scheme.

## SILVER MEDAL DESIGN FOR A COAL-BOX.

ON May 14th we illustrated the two first of a series of three designs for coal-boxes, for which a National Silver Medal was awarded to Mr. A. H. Baxter. To-day we give the third, which represents a design intended to be executed in oak and iron polished. The door opens on hinges, as shown by the perspective sketch, and the shovel is located to the rear of the zinc container, so as to be ready for use when the fall-down shoot is brought forward. There is a projecting flange on the cheeks of the container, which prevents it from opening further than the limit exhibited by diagrams Nos. 1 and 2.

## HOUSE AT LIGHTCLIFFE, YORKSHIRE.

This house is now in course of erection upon an acre site in a suburb of Halifax, which commands extensive views in every direction. The walls are to be built of local "delph dressed outsides" stones, with boasted Ringby ashlar dressings. The roofs will be covered with green Buttermere slates, and the internal woodwork will be of pine and Austrian oak. The windows will be glazed into the stonework, and have metal casements and leaded glazing above transoms. An attempt has been made in the design to give the house a simple local character, similar to the many examples of 17th-century work which are to be found in the West Riding, especially in the parish of Halifax. The work is being carried out under separate contracts for each trade by local men under the superintendence and from the designs of Mr. Joseph F. Walsh, architect, of Halifax.

## PAIR OF HOUSES, SKEGNESS.

THIS pair of houses, now being built upon Lord Scarborough's estate, like the single house illustrated in our pages for May 14th last, was designed by Mr. Henry G. Gamble, architect, Lincoln. The style is the same; but though the houses are in this case smaller, owing to the dovetailing of the houses into one another, there is a slight gain in the arrangement.

## CHIPS.

A portrait of Lord Clive, painted by Sir N. Dance, R.A., has been presented to the Indian Institute by Mr. Edward Walford, M.A., formerly scholar of Balliol College.

Plans for the proposed Jubilee swimming baths, for Bradford-on-Avon, have been accepted, a site in Bridge-street having been given by Mr. John Moulton. The dimensions of the building will be 76ft. by 36ft., and the swimming bath will be about 14ft. by 16ft., lined with white glazed bricks, the depth of water being from 3ft. to 6ft.

Princess Henry of Battenberg has fixed Saturday, July 31, as the date for the ceremony of laying the foundation stone of the 11th block of houses of the Royal National Hospital for Consumption and Diseases of the Chest.

Premises which have been erected to replace some old buildings at 3, Mincing-lane, are now approaching completion. The block is faced in Portland stone with red Peterhead granite at the doorways. The contractors are Messrs. Higgs and Hill, of Crown Works, Lambeth, and the architect is Mr. Gaymour Cuthbert, of 83, Queen-street.

During the last week the work of letting in the water at St. Andrew's dock extension at Hull has been completed. The construction of the extension has occupied about 2½ years. The works would have been finished much sooner, but for an unfortunate accident which occurred about a year since, when the dock was prematurely flooded.

Lord Morley's Committee of the House of Lords have passed a Bill, granting to the Charing Cross, Euston, and Hampstead Railway Company an extension of time for three years from August next, within which to construct this underground railway as authorised in 1893.

Colonel W. Langton Coke, one of the inspectors of the Local Government Board, held an inquiry at Birmingham, recently, relative to the application of the city council for sanction to borrow £1,500 for the alteration and extension of the Deritend Branch Library, and £600 for laying out the land adjoining Cannon Hill Park, recently presented to the city by Mr. J. C. Holder. With regard to the proposed extension of the Deritend Branch Library, the town clerk explained that the existing building had been very unsatisfactory for many years, being inconvenient, ill-lighted, and badly ventilated. If the plans which had been prepared were carried out, the accommodation would be almost doubled, and means would be taken to improve the lighting. Mr. J. A. Cossins (Messrs. Cossins, Peacock, and Bewlay, of Birmingham) produced and explained plans which he had prepared for the extension.

The restoration of Cotham Wesleyan Chapel, Bristol, has proceeded so far that memorial-stones were laid last week. The original outlines of the structure will be observed, with the addition of an organ and choir chamber at the rear. The walls will be of Pennant stone, with Bath stone dressings, the internal fittings of pitch-pine, the choir having a groined ceiling and carved stall-ends. The pulpit is to be of the same design as before, but somewhat larger. There is to be a choir window of stained glass. The architects are Mr. R. Curwen, A.R.I.B.A., of London, and Mr. H. J. Jones, M.S.A., of Bristol, and the builders Messrs. Stephens, Bastow, and Co. The estimated cost is close on £7,000, of which nearly £6,000 is forthcoming from insurance of the original building.

## COMPETITIONS.

CROMPTON.—In the competition for new public baths to be erected at Crompton, for the urban district council of Shaw and Crompton, near Oldham, sixteen designs were submitted. The limit of cost was £4,000, and May 1st was the latest for sending in plans, which were numbered by the clerk as received, neither names nor mottoes being allowed. Mr. T. Chadwick, A.R.I.B.A., of the firm of Booth and Chadwick, Oxford-street, Manchester, acted as assessor, and awarded the premiums as follows—First, £30, Messrs. Wild, Collins, and Wild, of Oldham; second, £20, Messrs. Harold, Cheetham, and Barlow, Oldham; and third, £10, Messrs. James Clegg and Wilson, also of Oldham.

RUGBY.—The Urban District Council have decided to erect municipal buildings in High-street. Premiums of 30 guineas and 20 guineas will be paid to the authors of the two designs placed first and second by the council (who will make the selection without an assessor), the premium to merge in the commission to be paid to the author if the premiated plan is carried out. A block plan of the site, with a copy of the printed instructions, may be obtained on application to Mr. D. G. Macdonald, C.E., engineer and surveyor, Rugby. The drawings, distinguished by a motto or device, must be delivered at the engineer's office by July 21.

The Bishop of Bloemfontein (Dr. Wale Hicks) dedicated the Brett Memorial fresco and pulpit at St. Matthias Church, Stoke Newington, on Saturday. Mr. David Bell has designed and executed the work.

At the last meeting of the Harrogate Corporation the borough surveyor was instructed to prepare plans for carrying out a further scheme of dealing with the increasing sewage; the cost to be £3,500.

It has been decided to erect a hall in Church-street, Melksham, to serve as a lodge-room for the local Freemasons. The work will be carried out under the superintendence of Mr. J. A. Randell, of Devizes, craft architect.

A Select Committee of the House of Commons, which has been considering the Bill of the New River Company for the raising of £1,000,000 further capital and the construction of mains and new works from Kempton Park to Fortis-green, decided on Monday that the preamble of the Bill was proved.

It is expected that the Standing Committee on Law will finish the Public Health (Scotland) Bill on Friday. The Bill will then be reprinted, and Mr. Caldwell will devote the Whitsuntide recess to the preparation of amendments for the Report stage.

A new feature of the Church Congress, which will meet at Nottingham in October, is that a section will be devoted to the discussion of painting, sculpture, and architecture as they respectively affect the Christian Church. Professor W. B. Richmond, R.A., will introduce the question of painting, and Dr. J. Charles Cox that of architecture. The selection for sculpture has not yet been made.

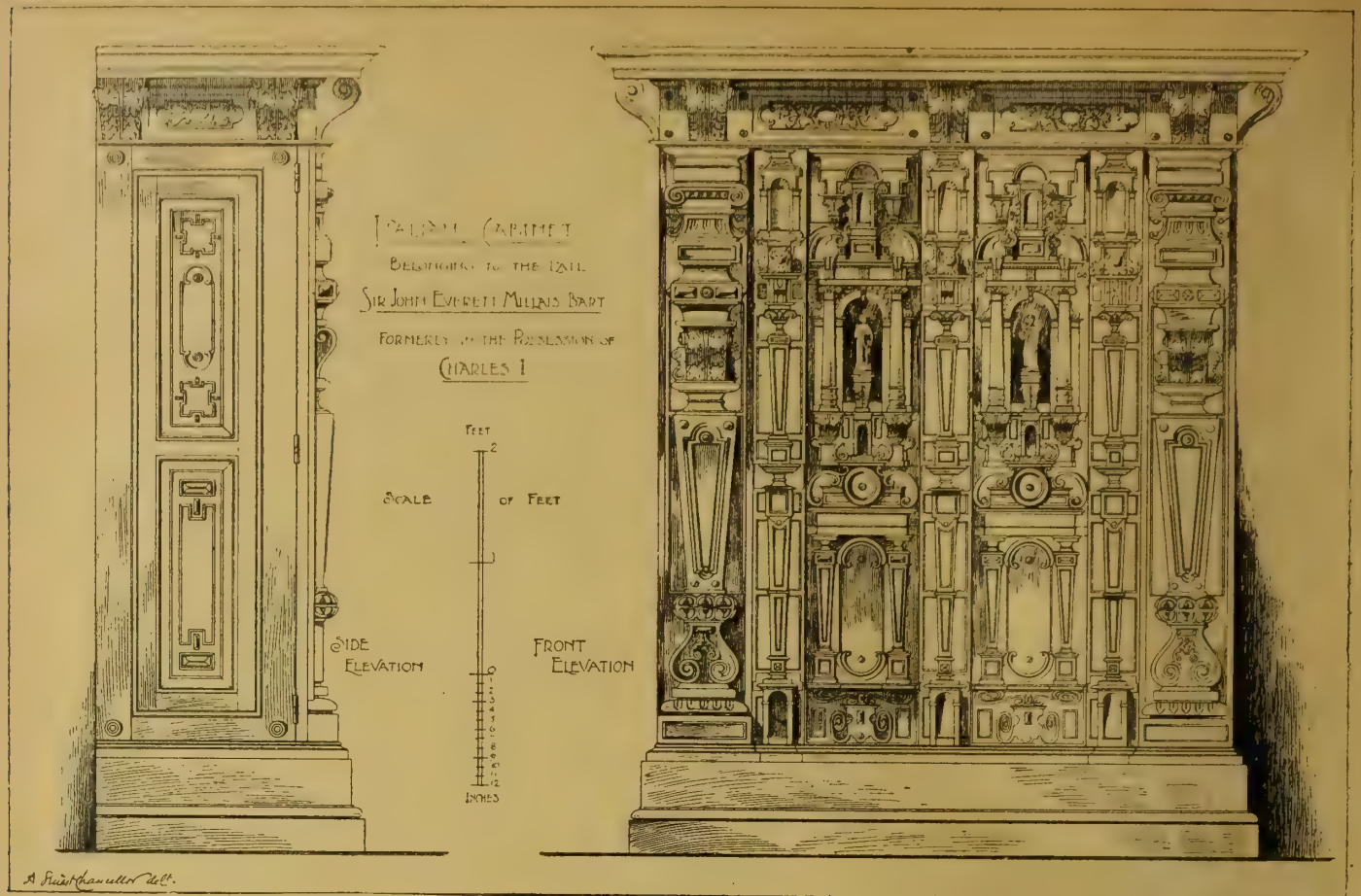
Over £1,100 has been raised in Huddersfield towards the cost of erecting a Jubilee memorial tower on Castle Hill, and the commemoration committee have accordingly decided to advertise for designs for the structure. Sir John Ramsden, in granting the site, stipulates that the tower must be worthy of its position.

The directors of the Great Western Railway Company are inviting tenders for the construction of the new piece of railway which is to open up a more direct route between London and South Wales. The new line will take almost a direct course from Wootton Bassett to Patchway, and will be about 33½ miles in length. Tenders have to be sent in by the 22nd of June.

A Bishop's chair has just been placed within the sanctuary of St. John the Evangelist's Church, Walton, Liverpool. It has been designed by Mr. C. E. Deacon, architect, of North John-street, Liverpool, in the Early English style, and is framed in massive English oak. The back is carried high, terminating with a crocketed gable. Within the tympanum is a shield bearing the arms of the see of Liverpool, surmounted by a bishop's mitre. On the back rail, amidst carved foliage, occurs the date, 1897. This addition to St. John's has been made by Messrs. Harry Hems and Sons, of Exeter.

The Royal Archeological Institute holds its annual meeting this year at Dorchester in the beginning of August. Dr. Cox has accepted the position of President of the Architectural Section, and proposes to take as the subject of his address "The Treatment of the Cathedral Churches of England during the Victorian Age."





#### AN ITALIAN CABINET.

**T**his cabinet, of Italian workmanship dating from the 16th century, was recently sold by auction for 145 guineas at Christies'. It formerly belonged to King Charles I., and, according to an old drawing, was located at Theobald's Palace, a magnificent house pulled down by the Parliamentary Commissioners in 1650, and previously used as a residence by both James I. and Charles I. The late President of the Royal Academy, Sir John Everett Millais, Bart., bought it from a well-known West-end furniture dealer, and used it as a background in his picture of the Princess Elizabeth in the Tower. The two silver figures were missing when the cabinet came into the possession of Millais, and he had new ones modelled as near as possible from the illustration referred to above. The interior is merely fitted with two shelves on bearers, and the two doors are veneered inside with simple panels of yellowish-green wood, with narrow borders of reddish brown.

#### EXHIBITION OF FIRE-RESISTING DECORATIONS.

**A**n interesting exhibition, suggested by the recent deplorable disaster in Paris, and organised by the United Asbestos Co., Limited, was opened in the rooms of the Society of Architects, at St. James's Hall, on Monday, by Colonel Robert W. Edis, F.S.A. The exhibits include specimens of crude asbestos from all parts of the world, and in various stages of manufacture, such as carded fibre, thread, yarn, and cloth. Wall-papers and other decorations manufactured from asbestos are also on view. These can be effectively used for friezes, dadoes, or ceilings, and are embossed with curious designs in high or low relief. There is also a model of a portable building made with "Besolite," which is fire and weather proof, and can be used as a substitute for wood for partitions, match-lining, roofs, bungalows, and portable buildings. Asbestos paint, cloth, ropes, ladders, paper, and asbestos-metallic packings and jointings also form part of the exhibit. The fireproof properties of the materials were practically demonstrated by subjecting them to fire, the patent "Salamander" decorations being absolutely fireproof. Colonel Edis, in opening the exhibition, strongly advised that great care should be exercised in regard to

the wooden erections which are springing up in all directions for the purposes of affording a view of the approaching Jubilee pageant, in order to prevent the panic that must certainly prevail should any accident from fire occur during their occupation. The exhibition remains open till Saturday.

#### EXCAVATIONS AT SILCHESTER.

**T**he results of last season's labours at Silchester are now on view, and will remain open at the rooms of the Society of Antiquaries, Burlington House, until the end of next week. Important results were obtained last year in individual objects of interest, although no buildings were discovered so noteworthy as the two great houses found in a former year in Insula XIV. The area excavated last season included two insulae—XV. and XVI.—immediately south of Insula XIII. and XIV., which were excavated in 1895. Number XV. appears to have been given up to the dyeing industry. It contained two houses, one of large size, and four other blocks of buildings, as well as the remains of several hearths and furnaces; and a large area towards the north seems to have been used as a bleaching-ground. One valuable discovery was that of two wells, one with a wooden framing at the bottom, and the other with a large wooden tub. Insula XVI. contained a large house of the courtyard type in the north-west angle, and two other houses of the corridor type, as well as an isolated square building. In one pit were found a large number of sheep's bladebones, perforated for use as rings and counters; and among the minor objects were a small Doric capital, a handle of a bowl of millefiore glass, two bronze bells, the bronze covering of a casket, and four gilt brooches.

The most striking discovery, however, was of a cutting, about 6½ ft. deep, outside the city and leading to the wall. Towards the east end were found remains of iron collars, at regular intervals, which showed that a wooden pipe had been laid in the cutting, the collars being used to join the piping together. A precisely similar discovery was made in France in 1772 on the site of a Roman town at Chatelet, between St. Dizier and Joinville, in Champagne, of which an account was given by M. Grignon, who carried out extensive excavations there by order of the King. The tracing of the pipe led to the discovery of a

hitherto unknown gate in the city wall, which bears a resemblance to one discovered near Aldersgate-street when the new Post Office buildings were erected. The gate had a single opening 12 ft. wide, which had been reduced to 7 ft. by blocking it with masonry. There was a ditch outside, traversed by a wooden bridge. The part of the bridge adjacent to the gate was probably either a drawbridge or one which could easily be destroyed, so as to render an attack impossible. The piping below led to Insula III., where there is an unexplored building which will be examined next season, and where it is conjectured that the principal or most-used baths of the city were situated. The gateway is a very durable structure of rubble and large flat stones.

#### CHIPS.

Plans have been prepared for the proposed restoration of the ancient parish church of St. Michal at Shap, Westmoreland. About £1,200 has been already subscribed towards the cost.

The Urban District Council of Clacton-on-Sea have adopted a proposal to establish a town yard at a cost of from £1,000 to £1,250; also a scheme for the supply of sea-water, for which £2,800 is to be borrowed.

The health committee of the Glasgow Corporation have decided to recommend that the salary of Dr. Chalmers, assistant medical officer, be increased from £500 to £600; and that the salary of Mr. M'Coll, superintendent of the cleansing department, be increased from £450 to £500.

A church which has been erected by the Sweden-borgian communion of Blackburn upon the site of an old edifice in Anvil-street was opened a few days since. The church, which is of Free Gothic design, will accommodate about 250 worshippers, and has cost £2,250.

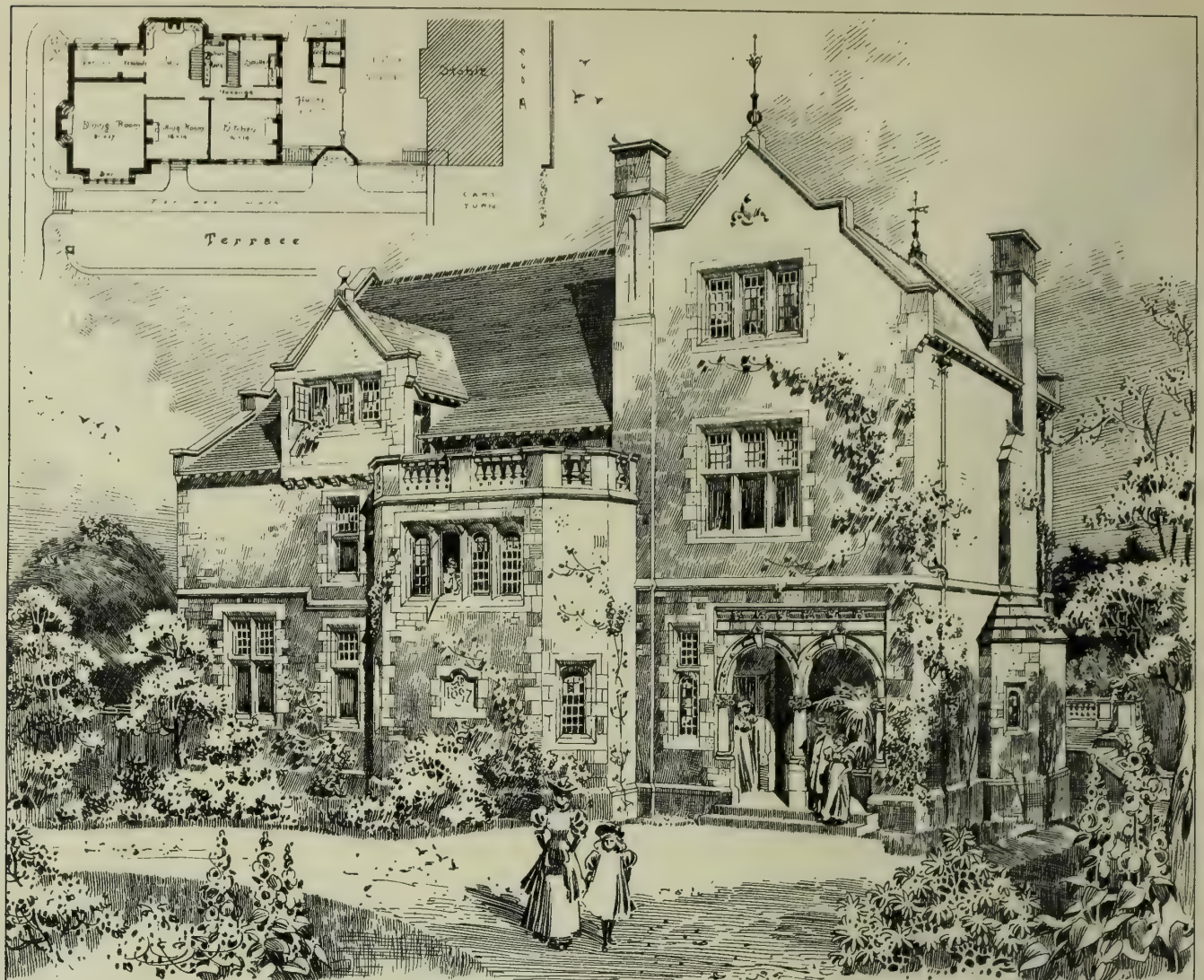
Devon County Council have resolved to recommend Messrs. Masterton, Acock, and S. W. Ingram, of Bridgwater, to the County Council for the two surveyorships of North and South Devon. The Council will make the final selection on June 17.

The Newport and Cincinnati Bridge across the Ohio River has just been completed. The bridge was designed by the late Max J. Becker, past president Am. Soc. C.E., and was built by the Edge Moor Bridge Works. It has a width of 74 ft., accommodating a double-track railway and electric cars, and a wide carriage-way. The 500 ft. span weighs 5,200,000 lb.









HOUSE AT LIGHTCLIFFE · YORKS

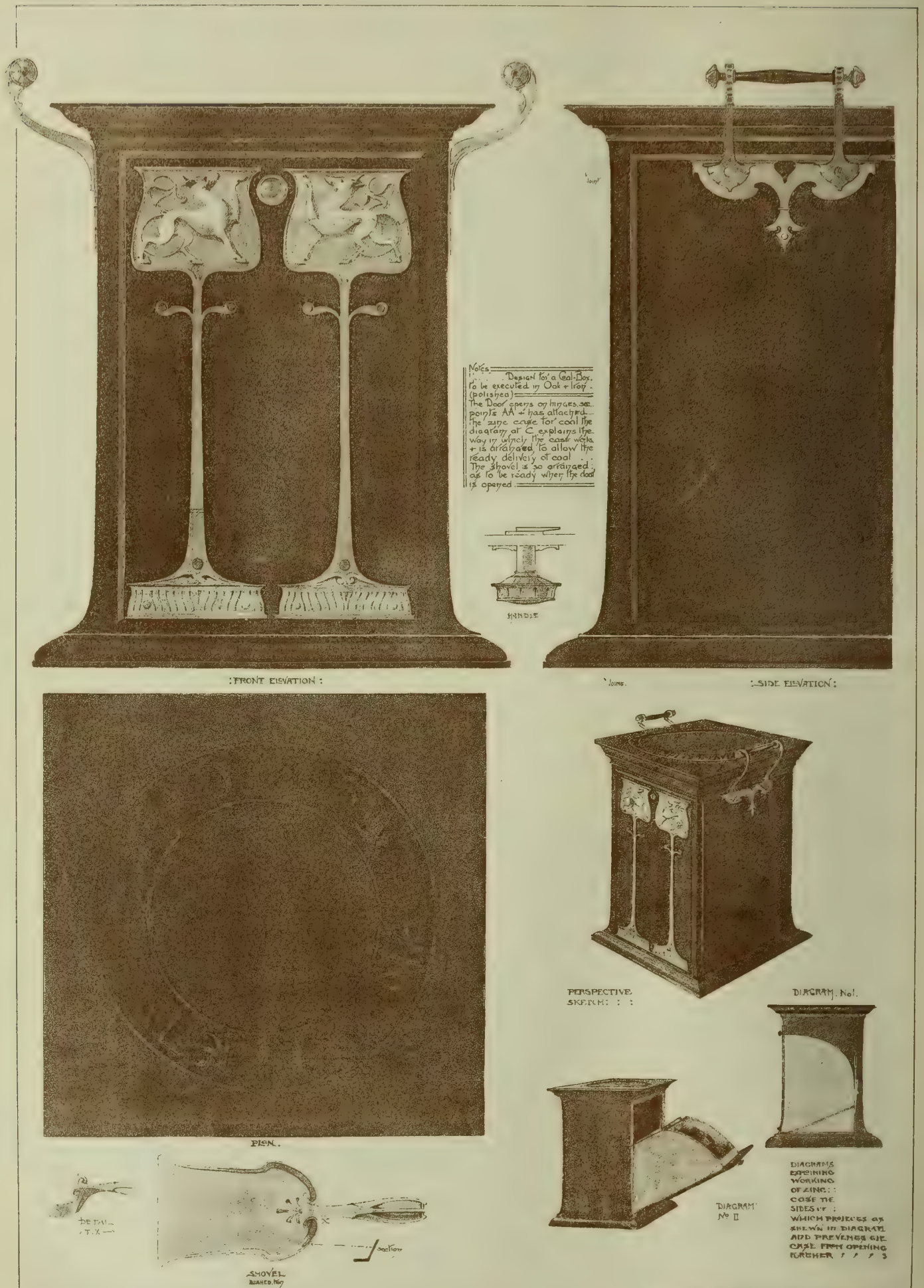
JOSEPH F. WALSH ARCHT

Photo Lithographed & Printed by James Akerman, 4, Queen Square, W.C.















THE SURVEYOR'S-INSTITUTION · GREAT · GEORGE ST. · WEST<sup>R</sup> · A WATERHOUSE · RA<sup>N</sup>





CH<sup>I</sup>



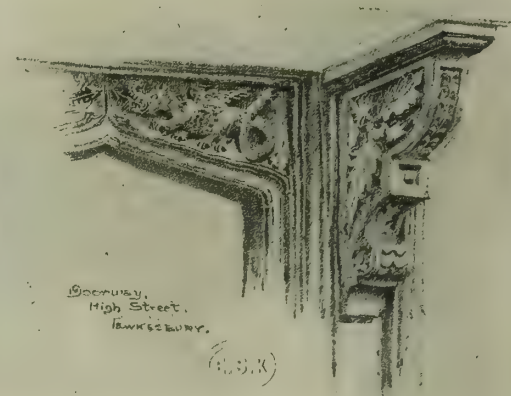
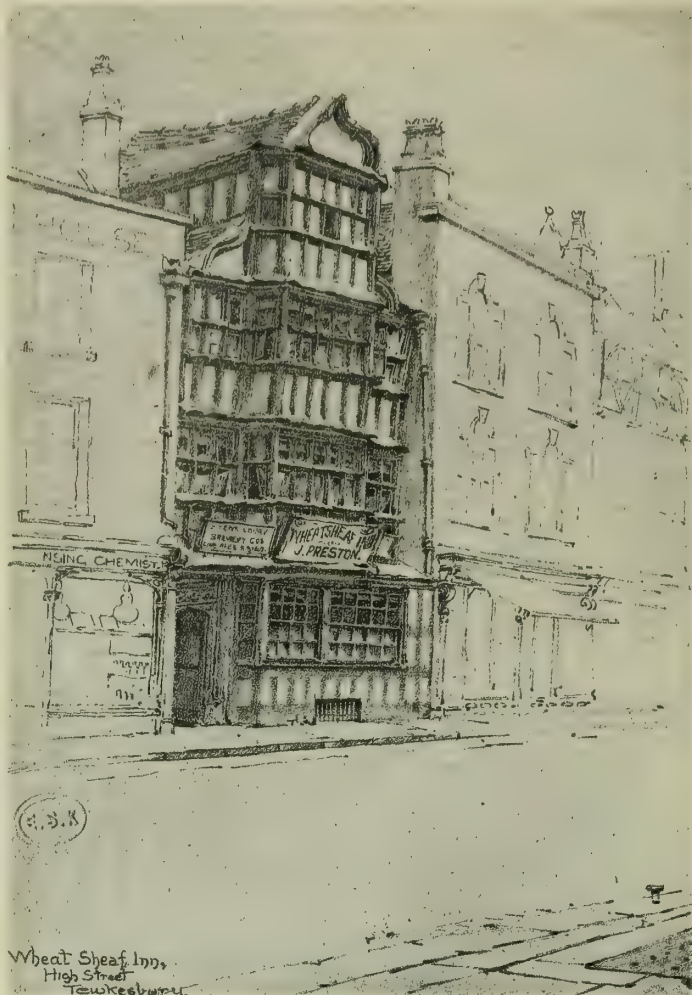




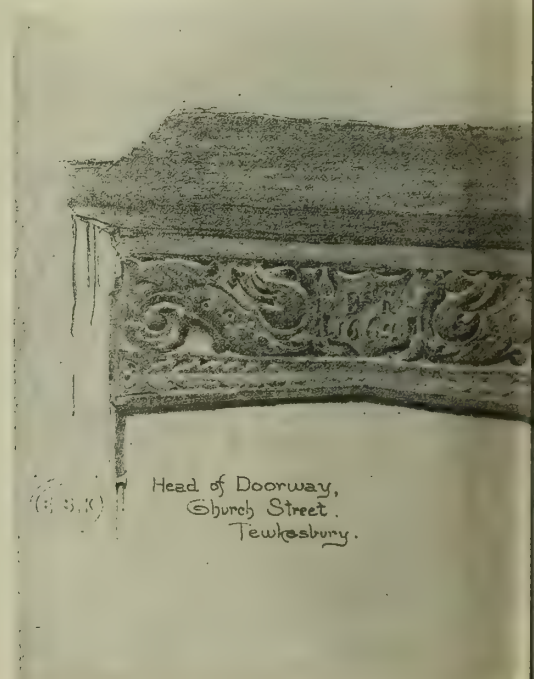
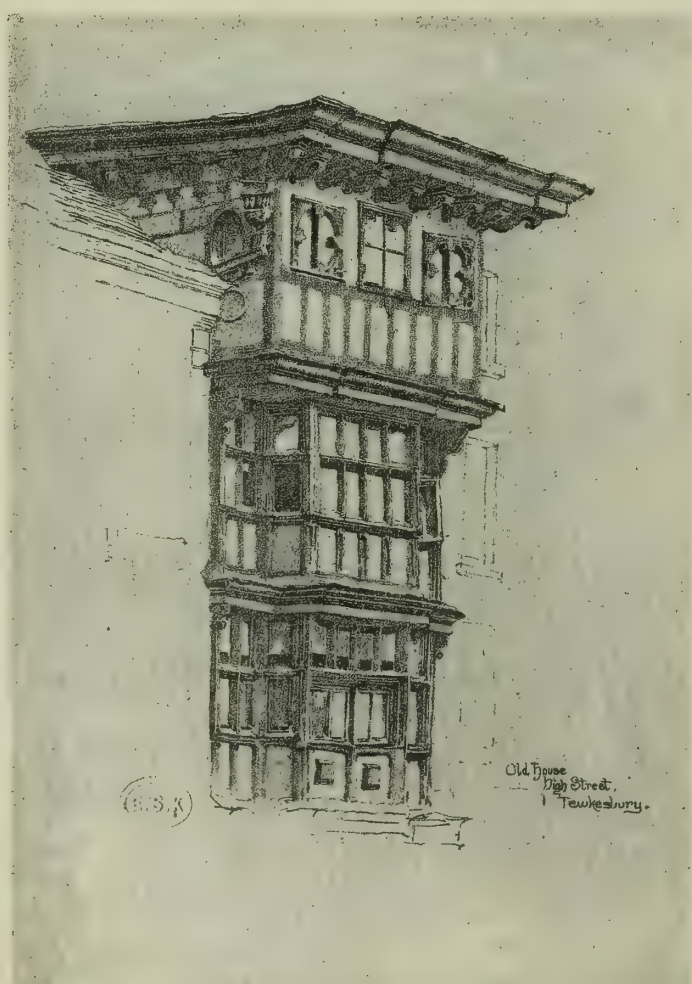








NATIONAL SILVER MEDAL D  
SKETCHES IN







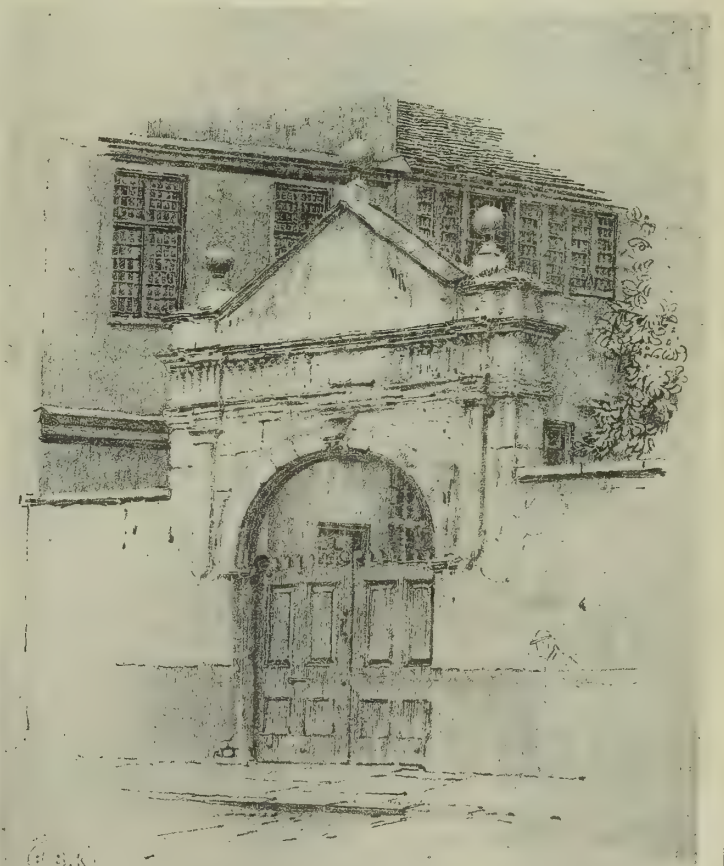
Old House  
High Street  
Tewkesbury



Doorway,  
Wheat Sheaf Inn,  
TEWKESBURY.

DRAWINGS BY JOHN D. WALKER.

TEWKESBURY.



Old Gateway  
High Street  
Tewkesbury.

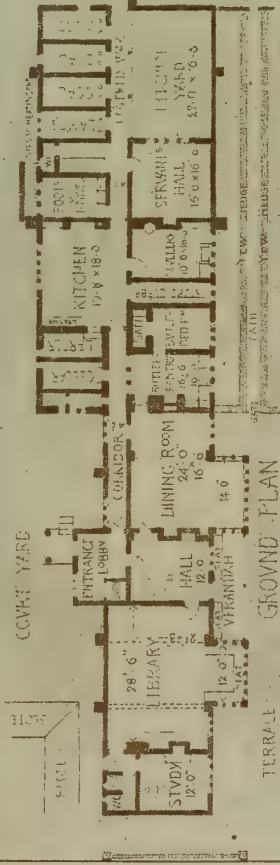






THE BUILDING NEWS, JUNE 4, 1897.

HOUSE FOR JULIAN · SIRGIS · ESORE  
AT POTTENHAM NEAR  
GUILDFORD · SURREY

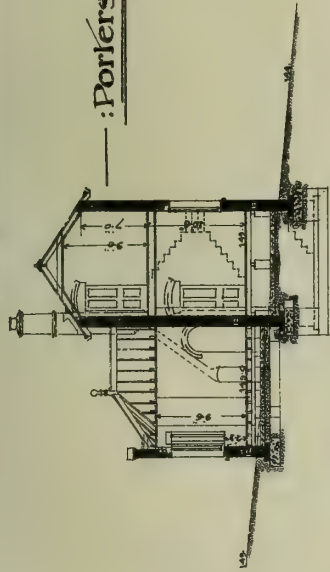




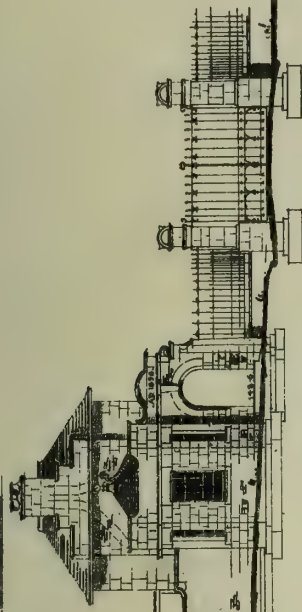




—:Galeshead Union:—  
—:Proposed Cottage Homes:—

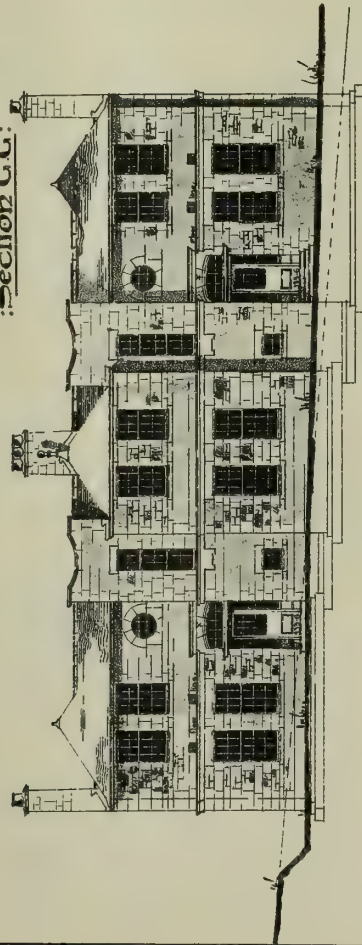


—:Porters Lodge:—



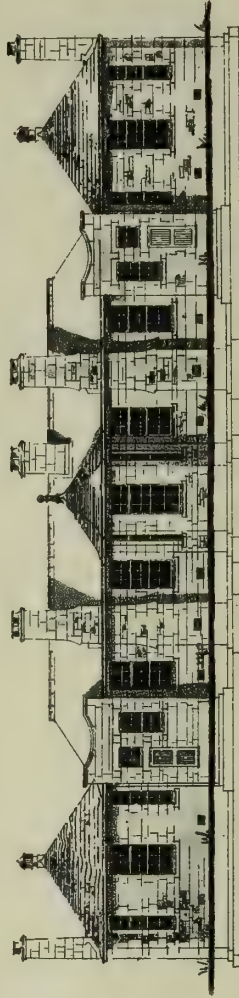
:North East Elevation:

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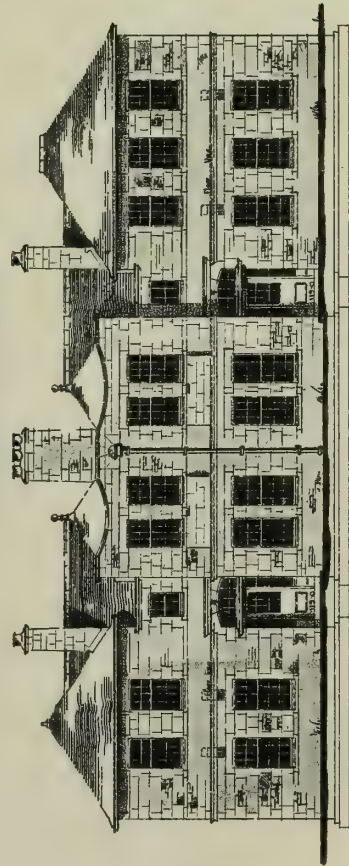
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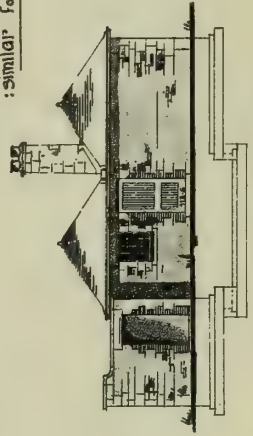
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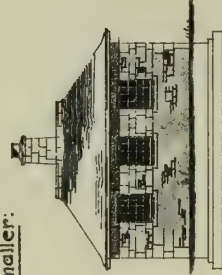
:North East Elevation:

—: Boys College:—

—: Laundry etc for Boys  
: similar for Girls but smaller:—



:South East Elevation:



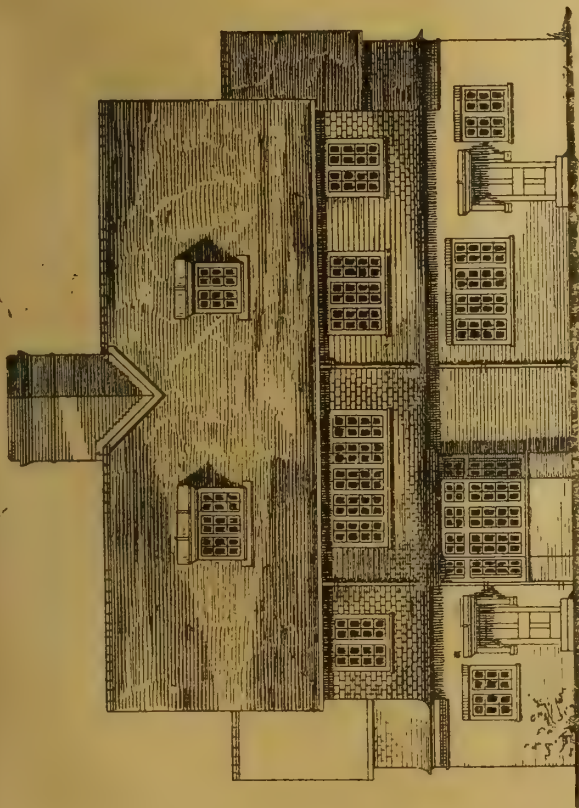
:North East Elevation:

Arch. Assoc.  
57, Southwark St.  
S.E.









Front Side  
Elevations



Ground  
Floor  
Plan



Attic  
Plan

Scale of Feet  
0 10 20 30

Pair of Houses at  
**SKEGNESS**  
on the estate of the  
Rt Hon. the Earl of  
Scarborough.

Henry G. Gamble  
A.R.I.B.A.  
Architect  
January, 1897.

First  
Floor  
Plan



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., L.I., L.II., L.III., L.IV., L.V., L.VI., L.VII., L.VIII., L.IX., L.X., L.XI., L.XII., L.XIII., L.XIV., L.XV., L.XVI., L.XVII., L.XVIII., L.XIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

\* In response to complaints from readers that they are unable to get the BUILDING NEWS at Messrs. W. H. Smith and Son's bookstalls, we can only suggest that they should order the paper of some other newsagent. Messrs. W. H. Smith and Son recently requested us to allow them an extra discount beyond that allowed to the general trade, and because we declined they have ceased to send the paper out to their bookstalls. We have, of course, no remedy; but we do not think the demand was a fair one.

JUBILEE SEATS. (A good many readers, knowing that the offices of this journal are in the best part of the Strand for a view of the Jubilee procession, are writing to ask if seats can be booked here. All such communications should be made to Mr. Hipkin, 13, Clifford's Inn, Fleet-street, E.C., who has the sole right to let the same.)

RECEIVED.—L. J. T.—R. C. D.—C. E. I. Co.—M. M.—F. L. S. and Co.—C. P. C.—H. M. S.

## Intercommunication.

## QUESTIONS.

[11671].—**Polishing Marble Carving.**—Are there instances of carved marble being polished? Can a string of running ornament, somewhat Byzantine in character, be polished, so as to look uniform in colour with the polished moulds above or below? Or does the dead effect of the carved marble enhance its value from an artistic point of view? If I remember rightly, the late Mr. G. E. Street had the carved cornice upon the fine alabaster pulpit in the nave of Christ Church, Dublin, oiled or varnished, so that the ornamentation might not contrast too crudely with the polished alabaster surroundings; but Mr. T. Drew, the present able architect to the edifice, distinctly (he will correct me if I err?) considers this a mistake. All carved work, he thinks, should be left from the artist's tool, and not be tampered with by the addition of any attempt to polish. On the same line of reasoning, wrought iron must not be filed, nor carved oak sand-papered! If I am wrong, will someone correct?—ONE THAT HAS SEEN A DEAL.

[11672].—**Architect's Custom.**—Could any of your readers inform me what the usual practice is in England for an architect to adopt when an order is given by the contractor to a merchant, or other person, for a certain sum to be taken out of the final certificate in payment for goods or services?—AUSTRAL.

[11673].—**Baths and Assembly Rooms.**—Would any reader inform me of the existence of a swimming-

bath which may be converted into an assembly or dancing hall, either in London or the country, with any particulars regarding working of same?—SEMI-PARIS.

[11674].—**Road Bridges.**—Does any reader know of a book dealing with the designing of iron bridges of moderate span for road-traffic only, and also with trough floors for the same?—W. F.

[11675].—**Aisle Roofs.**—Will some kind reader advise me as to the best way of treating the roofs of the aisles of a church which, having a slope of about 30°, and being covered with plain tiles, let the rain in? The roof is boarded under the tiles. Would felt make a good and permanent job, or would it get sodden and rot the boarding? I believe Doulton makes an ingenious tile which is set in cement, and makes the roof practically a solid slab. But is there not danger of this slab cracking if anyone walks on it, and becoming irreparable? I should like to keep to red tiles if possible, for appearance sake.—LINCOLN.

[11676].—**Architect's Responsibility.**—A gentleman built a house here, for which I was architect and carried out the works. The house has been finished and occupied; but the employer does not seem to have funds to pay the final instalments to the contractors, as also my fee. He borrowed from a building society two-thirds of the money to build the house; this money is now exhausted, and the contractors are pressing me for payments of the balances of their accounts. I have sent them their accounts, and told them to present them to the employer for payment, same as the ordinary certificate for instalments. I understand the employer has not the necessary funds to pay up. I wish your opinion as to the best steps to take in the case. The building society have, of course, got the principal part of the house through their loan. This, I understand, the employer has handed over to a bank in security for some money borrowed. If the house were to be sold, can the contractors claim their contract money before any other payments are made? In a case of this kind, is the architect in any way responsible for the contract money, and can the contractors sue him for the balances due them?—PRO ET CON.

## REPLIES.

[11662].—**Surveyors' License.**—I believe the law requires the surveyor who values dilapidations for an owner or solicitor to have a license, which is about £2 annually. Appraisements made for the information of one party only, and not obligatory, are exempt according to the section quoted. The revenue officer's meaning is no doubt with respect to valuations given for a special business transaction, as for the information of a solicitor or a valuation that is acted on. Many architects and surveyors make appraisements or valuations for the information of their clients without having a license; but they are not official valuations, but mere opinions.—H. G.

[11664].—**School Floor.**—To give a specification for a first-rate school floor which will be reasonably free from sound in schoolroom and room beneath is rather a large question. I would advise "L. S. W." to specify the Denett fireproof floor, or some other kind of floor, where the iron joists are filled between with concrete. Stuart's granolithic flooring will be found to give the desired result of being sound-proof, and any of the firms advertised in the BUILDING NEWS will supply information. If the ordinary wooden joist floor is used, pugging with fibrous plaster on fillets nailed to the joists, or a layer of asbestos below the boards will be sufficient.—ARCHITECT.

[11665].—**Slates.**—"A. G. C." wants to specify for bright green slates, and wishes to know a quarry from which reliable bright pea-green slates can be obtained, or common tiles of such colour. The Coniston Green Slate Company, Coniston, Lancashire, and the Green Slate Company, Kendal, Westmoreland, may be relied upon, and the secretaries of these companies will no doubt give all particulars. The best Westmoreland green slates are not open to the objection "A. G. C." mentions, though some green slates are porous, and become discoloured. Specify "best Ilbertthwaite green slates, laid to 3in. lap on diminishing courses, £2 15s. per square."—G.

[11666].—**Weak Floor.**—"Novice's" scheme of stiffening his floor would no doubt help to strengthen the floor a little. A more effectual way would be to take up the boards every 3ft. or 4ft. apart, and introduce solid strutting of the same scantling as the joists—three rows of such strutting securely nailed to the joists, or herring-bone strutting. The plan "Novice" proposes would be troublesome, and the bar iron would not be so thorough a stiffener as solid pieces put in between the joists. Plates of iron of the whole depth of joist screwed on securely to every fifth or sixth joist on one side would no doubt add to the strength.—G. H. G.

[11669].—**Ceiling Decoration.**—I have a new mode of decoration for walls and ceilings most adaptable to mansions and palaces, easily put into position, and some of the most beautiful designs and effects can be obtained (already patented); but not being in a financial position at present, the manufacture has to lie dormant. I should feel it a pleasure to show the workings of same. I have a crude model at hand which would convey everything necessary. I may also say to manufacture this new block decorative ceiling and to sell at a moderate price would leave a profit of about 200 per cent.—M. W. WRAGG, 97, Addison-gardens, W.

[11667].—**Elizabethan and Queen Anne.**—It is difficult to quote authorities, as very few of those who have published books on these styles have given details. THE BUILDING NEWS volumes contain many of the best examples of both styles, and give details. Such examples of Elizabethan as Haddon Hall, Derbyshire (1540); Bramshill Manor (1609), Surrey; Longleat Wollaton, Bursleigh House, Lincolnshire; Cobham Hall, Kent (1594), have all been published in the "B. N." in the Architectural Association Sketch Book. The illustrated works of Nash, the late work on "English Renaissance" by Mr. Gotch, the textbooks of Fergusson and Gwilt, give general particulars of the style; but for details and mouldings, the student must refer to typical examples, and to details published in the various works and professional journals. In the Queen Anne style, "Austral" will do well to consult the works of Norman Shaw, J. J. Stevenson, and the pages of the BUILDING

NEWS, and other journals. The only "best authorities" in these styles are those who are most endowed with the genius and character of those periods, and have done the best work in them.—G. H. G.

[11673].—**Iron Casements.**—The iron frame is fixed in a rebate or groove made in the stone mullion. Several makers of wrought-iron and steel casements and sashes supply several sections; some of these have wrought-steel moulded bars. Burt and Potts, York-street, S.W., the Crittal Manufacturing Co., Ltd., Baintree, G. Wragge, White, and Son, are a few of the firms which make superior metal casements adapted for first-class houses. If Laurence Hobson sends for any of their illustrated catalogues, he will find an answer to his question. The frames ought to be moulded so as to give a neat finish to the mullion on the outside. The finishing on the inside may be cased in wood and moulded; but this is not necessary, as the metal frame can be moulded, and form a combination of members with the finished stone mullion. Bronze makes a neat appearance. I should advise L. H. to send for sections suitable for fixing to stone mullions.—G. H. G.

## PARLIAMENTARY NOTES.

THE PERILOUS STATE OF SOUTH KENSINGTON MUSEUM.—Lord Warkworth asked the First Lord of the Treasury, on Friday, whether he was able to state what course the Government proposed to take in view of the unanimous report from the Select Committee on Museums of the Science and Art Department, with regard to the serious danger of destruction by fire to which the collections at the South Kensington Museum are exposed. Mr. T. G. Bowles made similar inquiries, to which Mr. Balfour replied, asking for further time before answering, and adding that the report was engaging the serious attention of the Government. On Monday night further questions were put to the First Commissioner of Works on the same subject by Sir F. S. Powell and Mr. Whitmore. Mr. Akers-Douglas gave an unsatisfactory rejoinder, merely referring members to the answer given on Friday by the First Lord of the Treasury. He further stated that the interim report in question was drawn up without consulting any representative of the Treasury or the Office of Works, nor were they afforded any opportunity of giving evidence.

## CHIPS.

At the meeting of the Liverpool City Council on Wednesday, it was agreed that the salary of Mr. Charles Dyll, curator of the Walker Art Gallery, be increased from £450 to £500 per annum.

At Chesterfield, on Saturday, three bricklayers were charged with intimidating Thomas Blackwell and others, employed by John Astill, builders' contractor, to prevent them working. The summonses arose out of a bricklayers' strike for a penny an hour at Shirebrook Colliery, where the colliery company are erecting about 200 houses. Defendants were alleged to have prevented some men working by threatening to pull down the scaffolding. Warrants were issued for two absconding defendants, and the case was adjourned.

After a long illness, Mr. G. J. Moore, of Wisbech, the main road surveyor to the Isle of Ely County Council, died at Northampton last week. Mr. Moore, who was 52 years of age, was the son of the late Mr. Wm. Moore, J.P., of Wisbech, and was formerly an auctioneer and estate agent at Wisbech.

Mr. H. Law, from the Local Government Board, held an inquiry at the North Wales Asylum on Friday, relative to the sum of £80,000 required from the five North Wales counties for the enlargement of the asylum, which has commenced. The opposition to the raising of the money and enlarging the building came principally from Carnarvonshire.

Mr. R. Norman Shaw, R.A., has designed the bronze memorial tablet which is to be erected in commemoration of the late Lord Leighton, President of the Royal Academy. Heraldic shields and bearings form a conspicuous feature in the composition of this design, which is hardly like anything hitherto produced by its author.

The members of the Bristol and Gloucester Archaeological Society had their annual excursion on Wednesday in last week. The Roman street in the hill village of Birdlip, Brimsfield with its 15th-century central tower let into a 13th-century building, Elkstone church on which are quaintly-carved corbels and gargoyles, Cowley Manor house, and Cubberley church were visited.

A Select Committee of the House of Commons gave a decision on Wednesday on a part of the Bill which the East London Water Company are promoting for the raising of £500,000 further capital, the greater part of which is required for the construction of the new storage reservoirs at Tottenham marshes. Some 93 acres of the site is Lammasland. The Committee found the preamble, so far as related to the position of the reservoirs, proved, subject to the Company handing over to the local authorities 25 acres of land in fee simple to be used for recreative purposes.



## LEGAL INTELLIGENCE.

**THE LONDON COUNTY COUNCIL AND THE ROWTON HOUSES.**—At the Lambeth Police-court, on May 23, Mr. A. A. Hopkins gave judgment in an application by the London County Council for penalties against Rowton Houses (Limited) for not obeying a notice served upon them by the Council under the London Building Act, 1894, section 14. The building in respect of which the complaint arose was Rowton Houses, Churchyard-row, Newington. Mr. Hopkins said there was no dispute about the facts; it was admitted that every fact necessary to raise the question must be found against the defendants. The allegation which concerned him was that the defendants' building was so high as to infringe the last proviso but one of the subsection 5 of section 13 of the London Building Act, 1894, and if that proviso applied the building was certainly too high by many feet. A minute examination of the diffuse and difficult language of this highly technical statute only landed one in a maze of contradiction, and he must therefore deal with it from a larger and broader view-point. If, say, the Gordon Hotels Company had done exactly what the defendants had done in the matter, and, after complying with the requirements of the statute, as the defendants complied with them, had erected on that very site one of their palaces, he thought it must be admitted that they might have gone to any height they pleased, and that no question could have arisen as to the height under the proviso, because the Gordon Hotels could not be said to be within it. For all the purposes of the London Building Act he could see no possible difference between, say, the Gordon Hotels Company building, a rich man's hotel, and Rowton Houses (Limited) building, a poor man's hotel. He was strongly of opinion that all the real merits were with the defendants, and he dismissed the summonses. Mr. Hopkins allowed £15 15s. costs.

**CURIOUS ACTION AGAINST A BUILDER, "ARCHITECT AND SURVEYOR."**—At the Bulth County Court May 24, before his Honour Deputy-Judge Evans, Harriet Davies, of Brynryd, Disserth, sued Robert Edward Davies, builder and contractor, Llandrindod Wells, to recover certain sums amounting to nearly £38, on account of his improper discharge of the duties of architect and surveyor in respect to the building of two cottages at Llandrindod Wells, known as Rhoslyn. Plaintiff's counsel stated that his client, a poor widow, decided to invest her money in building two cottages at Llandrindod Wells, and tenders having been advertised for, the work was let to Messrs. Millward and Sons, builders, of Llandrindod Wells. Defendant was a builder in the same town, and also acted as an architect and surveyor, and to him plaintiff intrusted the duty of preparing plans and specifications of the cottages. After Messrs. Millward had taken the contract plaintiff engaged defendant to act as her architect and surveyor, to superintend the erection of the houses. This also involved the giving of certificates that the work was properly done. Mr. Davies was to be paid a small sum for his work, and they now complained that he had permitted the builders to depart from the specifications, and that he had given them certificates for work not properly done and for work not done at all. Messrs. Millward brought an action against plaintiff, and made her pay. It might be asked why they now brought their action against Mr. Davies, but they had engaged him as their architect, and contended that it was his duty to see that the work was properly done, and only to issue certificates accordingly. A schedule, showing the sums claimed, was put before his Honour, and he was asked to decide. Did defendant give certificates for work which was never done, and did he allow for work which was improperly done? Plaintiff had called in the assistant surveyor of the Breconshire County Council, who went over the work with defendant, and prepared a list of defendant's omissions and commissions, to which defendant practically agreed. In the contract of Messrs. Millward there was an undertaking to complete the houses by a certain date, or pay a penalty of £1 a week until the houses were completed. As a fact the houses were considerably behind time, and in the claim £8 was included for rent lost. Plaintiff deposed that she agreed with Messrs. Millward for the erection of the two houses, having engaged defendant to prepare the plans and Mr. Jones to get out the contract. After Messrs. Millward had commenced the work, she saw Mr. Davies, and asked him to look after the work, which he agreed to for £3, to include that work and the preparation of the plans and specifications. Plaintiff did not interfere with the contractors; but when she saw anything amiss she spoke to defendant as surveyor. His Honour could not see why Mrs. Davies did not set up this claim when she was sued by the contractors; but her counsel contended that she was stopped by defendant's certificate. Defendant said he did not give a certificate at all; but counsel replied that there was an account made out, which came to the same thing; as defendant had certified the account, they could

not go behind their own architect's award. His Honour did not see where defendant's liability came in. As he understood plaintiff's case, it was that, having employed a contractor, and not being satisfied with his work, she spoke to defendant, who had already prepared the plans and specifications for her, and asked him to superintend the work and see that it was properly done. Defendant was to be paid £3 for everything. The work was completed; but, apparently, no provision was made in the contract for payment of the instalments upon the production of a certificate in the ordinary way, and, that being so, he supposed the contractors made demands upon the plaintiff, who at various times paid sums on account. The claim now was that plaintiff suffered damage owing to defendant not having sufficiently superintended the work. His Honour refused to accept the account as a certificate, for the contract made no provision for any certificate. Mr. Thomas Williams, architect and surveyor, of Brecon, deputy county surveyor, said he visited Llandrindod Wells on the 10th October, and went through the plans on the spot with Mr. Davies (the defendant). A schedule of deductions was drawn up. Arthur Lewis Davies, plaintiff's son, said he was present when defendant agreed with his mother to prepare the plans and specifications and to look after the building for £3. Witness was present when Mr. T. Williams went over the work with defendant. His Honour maintained that plaintiff was not bound by Mr. Davies's signature to the account, at which Mr. Wallis expressed surprise; but the Judge said it was not in the contract. Plaintiff was then cross-examined, and said that she had known defendant for 20 years as a builder and mason, but not as an architect and surveyor. She did not employ an architect because Mr. Davies said he would help her, and she wanted to save expense. She left everything to defendant. The Judge remarked that the plaintiff's statement that she never heard of defendant as being an architect rather put her whole case out of court. Plaintiff's counsel asked that the description of the defendant should be amended to that of architect, surveyor, and builder. He argued that a man made himself liable if he undertook the duties of an architect or surveyor. Any man might do that, as there was no legal disqualification, and all over the country men performed the duties of architect and surveyor to the great hindrance of the profession, and the great disfigurement of their towns and villages; but having undertaken such duties, defendant was liable, although it might be a hardship in this case. Defendant stated that he had known Mrs. Davies for 20 years. He had never held himself out as an architect or surveyor, nor had he undertaken such duties. He never led the plaintiff to believe that he was an architect and surveyor. The conversation was at his house. Mrs. Davies said she was ignorant about building, and as she lived at a distance, asked him to inspect the work sometimes. He agreed to do this. After further legal argument, his Honour said there was no evidence that defendant was engaged as an architect and surveyor. He should give a verdict for defendant, but without costs.

**THE DOUGLAS SUSPENSION BRIDGE COMPANY, LIMITED.**—In the Court of Chancery at Douglas, on Thursday, an action was brought by the Douglas Head Suspension Bridge, Limited, in liquidation, against the Standard Contract and Debenture Corporation, Limited, also in liquidation. The defendant company undertook to float the plaintiff company, and to erect a suspension bridge and Eiffel Tower for £100,000. They received on account in cash and shares about £42,000, and when they failed had only laid the foundations, at a cost of £4,000. The directors in both instances were practically the same, and it was proved that when they entered into the contract the assets of the Standard Contract Corporation only amounted to £760. The action was brought to recover 10,929 shares allotted by the plaintiff company, and the balance in money. The official liquidator of the Standard Company stated that the gross assets only amounted to £500, and that if the action was fought they would not cover the costs. Under these circumstances a compromise was effected by which the plaintiffs agreed to the retransfer of the shares and £20,000 damages. An order was also granted declaring the agreements to have been a gross fraud, and setting them aside as fraudulent and void.

**ANCIENT LIGHTS.**—At the Chancery Court, St. George's Hall, Liverpool, Vice-Chancellor Hall sat on Thursday and Friday in last week for the purpose of hearing the action, Wright v. King, which was brought by Mrs. Wright to obtain an injunction against the defendants (Messrs. King and Barton, grocers), with regard to ancient lights in connection with property in Ashley-road, Southport. From the evidence given in support of the plaintiff's case it appeared that the defendants, by erecting a new building in the immediate neighbourhood, of more extensive area than the old building, had diminished the lights of the plaintiff's premises. For the defence it was contended that no right of ancient lights existed, and that no damage was done to the plaintiff. After hearing evidence,

his Honour granted the plaintiff £30 damages, and costs.

**THE WIDENING OF UPPER THAMES-STREET.**—At Court of Quarter Sessions at the City Guildhall on Thursday in last week, a case in which Mr. H. O'Brien, C.C., claimed compensation from the Commission of Sewers in respect of the frontage of 16 and 17, Upper Thames-street, which is to be thrown into the public way in completion of the scheme for the widening of Upper Thames-street, came before the Recorder and a special jury. The claim was for £2,884 in respect to the frontage in question. Mr. O'Brien having produced the lease of the property in question, and given evidence in respect thereto, Mr. J. Green, of the firm of Green and Weatherall, Chancery-lane, said he estimated the value of the land to be laid into the public way at 3s. 6d. per foot. He thought the claimant was also entitled to £244, representing the profit on the new building, and £250 for consequent damage. In his opinion the larger area of the land would suffer by the smaller portion being taken away, the possible erection of a staircase or the building of lavatories being attended with some difficulty. Mr. Ellwood, a surveyor, said he had arrived at a somewhat similar estimate as being a fair sum. He regarded the present frontage to the street as being a valuable one for advertisement purposes. Sir Edward Clarke said the Commission of Sewers was anxious that Mr. O'Brien should be fairly compensated. Mr. R. Vigers stated that, after surveying the site, he estimated the value of the land thrown into the public way at 3s. 6d. per foot, and he based that calculation upon his experience of property in that locality. He did not think any profit would accrue upon the new building as had been suggested, as it was, in his opinion, likely to be an expensive one. But the site for building purposes would be much improved. Mr. A. R. Stenning agreed with Mr. Vigers that 3s. 6d. per foot was a fair estimate of the value of the 240ft. frontage. The jury ultimately awarded the claimant compensation to the amount of £1,900.

**EFFECT OF THE PRIVATE STREETS WORKS ACT.**—**HESTON AND ISLEWORTH URBAN DISTRICT COUNCIL v. GROUT.**—In the Chancery Division, Mr. Justice North has given judgment in this case, which raised the question as to the effect of the adoption by an urban council of the Private Street Works Act, 1892, in the relationship of the council to frontagers on whom notices to make up their road have been served. On August 30, 1891, the Heston and Isleworth Local Boards, the predecessors of the plaintiff authority, served notices on the frontagers of Prince Regent-road, Hounslow, to sewer and make up the road, in accordance with deposited plans and sections, within three months. All the formalities required by the Public Health Act, 1875, had been duly complied with, and in consequence, on January 30, 1892, the local authority became entitled to do the required work and charge the frontagers with the expenses in proportion to their frontage. The local authority desired to do the work by means of a loan, and applied to the Local Government Board for authority to raise such loan, together with a loan for another purpose. The Local Government Board, however, refused to sanction the loan, because of the defective state of some sewerage works in the district, and it was not until November 12, 1894, that the authority who were then the district council got the necessary sanction to a loan. They then issued tenders for the work, and on January 30, 1894, entered into a contract, under which the work was completed in October, 1895. A sum of £157 14s. 10d. was apportioned as the share of the defendant in respect of frontage to property in the road owned by him. This was a summons for a declaration that the apportioned sum was due from the defendant to the plaintiff council, and that the amount, with interest and costs, was charged on the defendant's property, and to enforce charge if not paid. In the mean time—namely, on June 12, 1894—the local authority had passed a resolution adopting the Private Street Improvement Act, 1892. The defendant contended that the plaintiff council had abandoned their right to do the work and charge for it by delay and their acts; and also that the effect of the adoption of the Private Street Improvement Act, 1892, was to render abortive the notice given by the authority to sewer and make up the road. The Private Streets Improvement Act has new provisions as to the making of the streets, and gives a power to apportion expenses by less rigid rules than those of the Act of 1875, and gives the frontagers different rights of contesting their liability from those previously in force. Section 24 provides that the powers given by the Act are in addition to other powers, and Section 25 provides that Sections 150, 151, and 152 of the Public Health Act, 1875 (the sections under which the local authority were acting), should not apply where the Act of 1892 was in force. It was contended on the part of the plaintiffs that section 38 of the Interpretation Act, 1889, kept alive the right of the district authority to proceed under their notice, notwithstanding their adoption of the Act of 1892. Mr. Justice North



gave judgment for the plaintiffs. He held that there had been no abandonment by the plaintiffs of their intention to do the works. He held also that the rights of the plaintiffs created by the notice were kept alive by the provisions of the Interpretation Act, 1889. It had been argued, he said, that section 25 of the Act of 1892 did not actually repeal the provisions of sections 150, 151, and 152 of the Public Health Act, and that therefore the provisions of the Interpretation Act did not apply. If that were the case, section 24 of the Private Street Improvement Act, 1892, applied to this case, and the provisions of the Public Health Act were still in force.

**IN RE M. O. JONES, PONTYPRIDD.**—A meeting of the creditors of Morris Owen Jones, builder, 145, Coedpenmaen-road, Pontypridd, was held on May 28, at the offices of the Official Receiver at Merthyr. The statement of affairs gave gross liabilities, £6,617 18s.; liabilities to rank for dividend, £735 8s. 2d.; net assets available for distribution, £351 19s. 5d.; deficiency, £383 8s. 9d. There are eight creditors for £5,865 returned as fully secured, and the value of the securities is estimated to yield a surplus over that amount of £257 10s.

**SEWERS NOT NUISANCES UNDER THE LONDON PUBLIC HEALTH ACT.**—FULHAM VESTRY (APPELLANTS) v. LONDON COUNTY COUNCIL (RESPONDENTS).—In the Queen's Bench Division, on May 24, Mr. Justice Day and Mr. Justice Lawrance gave judgment in this appeal on a case stated by certain justices of Kensington, which dismissed a summons taken out by the Fulham Vestry, calling on the London County Council to abate a nuisance. The appellants had applied for a summons against the respondents on a complaint, by the appellants, of a nuisance from foul smells, dangerous to health, arising from a surface sewer ventilator constructed by the respondents in the surface of a roadway within the appellants' district. The sewer formed part of the main drainage system of London. The complaint was made under the Public Health (London) Act, 1891, Section 5. The appellants contended that the nuisance came within Section 2 (1) b of the said Act, arising from a "watercourse" or a "drain" in such a condition as to be dangerous to health. The respondents contended that the summary abatement of nuisances in relation to drains under the Public Health (London) Act, 1891, did not apply to public "sewers." The justices held that a public sewer was not within the definition of nuisances to be dealt with under Section 2 (1) b of the said Act, and that they had no jurisdiction, therefore, to deal with the complaint, and discharged the summons, but stated the case. Mr. Danckwerts, for the appellants, argued that a "sewer" came within the words "drain or watercourse," and relied on "St. Helen's Chemical Company v. St. Helen's Corporation." The ventilation of the sewer could easily be remedied. Mr. Bosanquet, Q.C., and Mr. Horace Avory, for the respondents, contended that the drains dealt with by the Act could not be construed as including public sewers, and relied on "The Queen v. Parlyb." Mr. Justice Day held that Section 2 (1) b of the Public Health (London) Act, 1891, could not be made to apply to defects in sewers vested in the London County Council, but only to premises, whether public or private, occupied by owners of property, as distinguishable from great public works constructed by public bodies for public purposes. No doubt the London County Council were liable, like any other public body, for any egregious mistake in the construction or maintenance of works intrusted to them by the Legislature, but for that they were only liable to the constitutional tribunals of the realm, and not to summary proceedings at petty sessions. Mr. Justice Lawrance concurred. The word "sewer" was not contained in the subsection in question, and was probably purposely omitted. Appeal dismissed.

The Correctional Tribunal of Epinal has acquitted the three official engineers against whom proceedings were instituted on account of the bursting of the reservoir of Bouzey in 1895, by which 100 people lost their lives.

Steps are being taken for the erection of a new Congregational Sunday-school at Shaw, near Oldham, in place of one recently destroyed by fire. It is proposed to build a school, with accommodation for 500 scholars, at a cost of £1,400.

The annual conference of the National Master Builders' Association will be held in Bristol in July, opening on Tuesday, the 20th. On the Thursday, the 22nd, the closing day, arrangements are being made for a visit to Bath of the association. The visitors will inspect the Abbey, the municipal buildings, the baths, and other central places of interest, and will then be driven in four-horse brakes to Corsham, where they will view the quarries, and be entertained to luncheon by the Directors of the Bath Stone Firms. The annual conference dinner of the association takes place at the Guildhall at Bath in the evening.

## WATER SUPPLY AND SANITARY MATTERS.

**THE DISPOSAL OF MANCHESTER SEWAGE.**—The Manchester City Surveyor, Mr. T. de Courcy Meade, has issued his report for the year ending December last on the treatment of sewage at the sewage works at Davyhulme. The net cost of the work for the year has been £15,780 5s. 0½d. This sum is exclusive of interest and repayment of capital, and is equivalent to £2 14s. 3d. per million gallons of sewage treated. The estimated population contributing to the sewage system has also increased from 338,000 on January 1, 1896, to 400,360 on January 1, 1897, or an increase of 18·4 per cent. The daily average flow of sewage for 1896 was 15,896,721 gallons, that for 1895 being 14,050,920 gallons, showing an increase at the rate of 1,845,801 gallons per day, or 13·1 per cent. The concentrated sewage of a great manufacturing community like Manchester, where trade effluents of a specially difficult nature have to be dealt with, and where, moreover, the sewage is varying in character from hour to hour throughout the day, demands constant attention and care. It should, therefore, be borne in mind, the report says, that no useful comparison can be made between the results obtained at Davyhulme and those recorded by communities which are largely residential. A contract has been entered into with the Naval Construction and Armaments Co. for the construction and supply of a steamer of a carrying capacity of 1,000 tons. The report, in conclusion, states: "Generally speaking, the year 1896 has been a period of experiment and inquiry rather than of direct and practical advance; and the laborious investigations consequent on the pressure exercised by the Mersey and Irwell Joint Committee have served to demonstrate more fully the crucial nature of the difficulties by which the corporation is surrounded in its endeavour to attain the high standard required by the Joint Committee in the purification of the city sewage."

## CHIPS.

Two branch lines from Lucerne via Seebourg to the St. Gothard Railway, which greatly shorten the journey between Zurich, Lucerne, and Milan, were opened on Monday.

The Jubilee Committee at Wadhurst, near Tunbridge Wells, have decided to offer a premium for the best design for a village hall, the limit of cost to be £1,500.

A new general hospital containing 120 beds is about to be built at Newport, Mon. The site of five acres has been given by Lord Tredegar. It is intended to make a start in August. The architect is Mr. R. J. Lovell, of Queen Victoria-street, London, whose plans were accepted in competition some months back.

A new Baptist chapel in Heaton-road, Newcastle-on-Tyne, was opened on Wednesday. Mr. W. H. Dunn is the architect, and the contract for the building was let to Mr. W. A. Laws. The new church is Early English in style, and is built of red brick, with stone facings and mouldings. It will seat 750 persons, and cost £5,000.

Through Canon Scott Holland, Mr. G. F. Watts, R.A., has provisionally presented his picture, "Time, Death, and Judgment," which forms part of his bequest to the nation, to St. Paul's Cathedral. Under the supervision of Mr. W. B. Richmond, R.A., the picture has been placed in position in the middle of the blank wall-space on the north side leading from the nave to the area of the dome.

Mr. John Woodhand, for many years superintendent of the Sanitary Department of the Leeds Corporation, died on Thursday in last week, aged 65 years. He was appointed inspector of nuisances for Leeds so far back as 1856. The scavenging and night-soil departments, and the work in connection with the destructors, were afterwards put under his charge, and he became Superintendent of the Sanitary Department. He retired in June, 1891. For some years he was chairman of the Yorkshire Association of Sanitary Inspectors.

It is stated on authority that, in consequence of the refusal of the Penrhyn quarrymen to accept the latest proposals of the management, Lord Penrhyn has decided that the men will not be afforded another opportunity of appealing to him as their employer.

The death occurred on Monday at Coble Dene, North Shields, of Mr. William George Edwards, who for 27 years had been head foreman mason for the River Tyne Commissioners. Mr. Edwards, who was in his 61st year, was a native of Plymouth, and went to the North of England about 40 years ago. He soon earned for himself a good reputation in the building trade, and was speedily installed as a trustworthy advocate of his fellow workmen. While residing at Howdon and Willington Quay he took an active interest in the welfare of the working classes. He was a keen co-operator, and represented North Shields at the Plymouth Conference. In politics he was an advanced Liberal.

## Our Office Table.

An amusing side-light on the vexed question, "Architecture a Profession or an Art?" is indicated in the June number of *A.A. Notes*, simply by the use of italics in printing the list of memorialists who recently addressed a communication to Sir John Gorst respecting the South Kensington Museum question. One of the editors of the above volume of essays, Mr. T. G. Jackson, R.A., and one of the contributors, Professor W. B. Richmond, R.A., both being advocates of architecture as *an art* and not a *profession*, are, however, sufficiently inconsistent in the above memorial to subscribe their signatures to this declaration:—"We, the undersigned, practising various branches of the arts as a *profession* . . . venture to address this memorial to you, &c." Having taken so decided a stand at any rate against architecture being practised at all as a profession, Messrs. Jackson and Richmond should really be a little more careful, and avoid thus declaring themselves professionalists.

The privately-printed report of the trustees of the Soane Museum for the year ending 1896 states that the tendency to improvement recorded in 1895 has been steadily maintained and further augmented. The very slight diminution in numbers of visitors was due solely to the wet autumn. In 1894 the number of visitors was 3,512; this total rose to 4,940 in 1895, while in 1896 the number was 4,860. The number of students for the same years was 12, 107, and 209. With the permission of the trustees, the museum has been thrown open on Saturday afternoons to various clubs, technical classes, and institutes, the various societies having the museum and its contents described to them by the curator, Mr. George H. Birch, F.S.A., A.R.I.B.A. About nineteen different societies availed themselves of this permission, and in several cases the members asked to be allowed to pay a second visit. On students' and private days the museum is practically never closed, for all foreigners and strangers in London are invariably admitted on presentation of their cards, while the general public have but to write for tickets, and they can also view it on closed days, but as there are no attendants present during the period the museum is closed to the public, or, on private days, it is necessary to give sufficient notice to the curator. The funds by which the museum is maintained were settled by Act of Parliament in the lifetime of Sir John Soane, and at the time were fully sufficient to permit a small surplus being invested each year so as to form a reserve or building fund, in case of repairs, painting, &c., but the heavy increase of rates and taxes, and the consequent diminution of the revenue by the change of the rate of interest on Consols from 3 per cent. to 2½ per cent., in addition to the extra expenses for attendants involved by opening the museum to the public four days a week instead of two, and six months in the year instead of three, as originally settled by the Act, makes it necessary to be economical in the management of the trust. The balance at the end of 1896, being exceptionally larger in consequence of the long-deferred payment by the London County Council of the compensation money for the loss of the freehold rights in the Lincoln's Inn Gardens inclosure, has been partly expended on providing artificial light, so that on dark days during the winter months the collection can still be seen, which before was almost impossible. In place of the late Lord Leighton, Sir J. E. Millais, Bart., and Sir B. W. Richardson, and Sir William Flower (resigned on account of ill health), Sir Edward J. Poynter, P.R.A., Sir George M. Birdwood, K.C.I.E., C.S.I., and Professor Arthur H. Church, M.A., F.R.S., have been appointed as trustees, in addition to those who have been identified with the trust for many years.

The Committee for the Survey of the Memorials of Greater London has issued its third annual report. About 1,000 drawings of old objects of interest have been made, including open spaces, be it noted, as well as buildings or beautiful trees, objects of local life, and any interesting piece of handicraft having an historical or aesthetic character. The chairman, Mr. C. R. Ashbee, is, however, over 100 guineas out of pocket according to the figures in the balance-sheet for the year. We are surprised at this when we look down the list of names of members accredited as members of this society. A call for funds concludes the hon. secretary's report.



IN a review of the recently highly successful Jubilee celebrations of the Architectural Association, published in the first article in the current issue of *A.A. Notes*, the editor (Mr. Beresford Pite) observes:—"A more permanent effect to the celebration of our fiftieth year of work is still to be sought and obtained. Many suggestions have been made and considered, with the result of bringing home very forcibly that we, having one supreme want, should make a determined effort to obtain somehow and somewhere good premises of our own. A useful building, in which definite usefulness may be added to the work of all our branches, from library, club rooms, and studios to meeting-rooms and offices, will be the best record of progress in the past and help for the future. The Jubilee committee are still sitting upon this project, and the early issue of a detailed appeal may be expected. When this is well started, the development of the School of Design and the consideration of how to carry our students well beyond examination point remain, upon which much can be said."

THE London County Council discussed at a special meeting on Friday, and again at their ordinary meeting on Tuesday last, the report submitted as the result of the inquiry into the administration of the Works Department. To the first recommendation of the report, "That, in the opinion of the Council, some definite organisation for the direct employment of labour and the direct execution of public works by the Council under the superintendence of its own officers is desirable and beneficial," Lord Onslow moved an amendment, practically proposing the abolition of the Department, and around this the controversy centred. The opposing parties were very evenly divided, but eventually the amendment for abolition was rejected by 54 to 47 votes. On a division there were 62 votes for the adoption of the first recommendation and 62 against it. The chairman declined to give a casting vote, and declared the recommendation not carried. A second vote after further debate also resulted in a tie, and it was agreed that the further consideration of the question should be resumed at a special meeting on Monday, June 28.

THE Sun Insurance Office has just issued its report for the year ending December 31st, 1896. It is one of wonderfully solid progress. The income from investments during the year has amounted to £72,957 15s. 10d. After providing for the usual reserve of 40 per cent. of the premiums to cover liabilities under current policies, a balance of £220,774 13s. 4d. remains, which has been transferred to the credit of the profit and loss account. The balance brought forward from last year amounted to £197,244 6s. 4d. There has been carried to a pension fund £41,000, to dividend reserve £50,000, paid for dividends in respect of the business of the year 1895 £90,000, making a total of £181,000, and leaving a credit balance of £16,244 6s. 4d., which by the operations of the year, as detailed in the account, has been increased to £229,874 13s. Out of this amount an interim dividend at the rate of 3s. per share, absorbing £36,000, was paid in January last, and the directors have declared a further dividend of 5s. 6d. per share, payable on the 9th July, which will absorb a further sum of £66,000, and leave £127,874 13s. to be carried forward. The funds of the office will then stand as follows:—Capital paid up, £120,000; general reserve, £1,150,000; dividend reserve, £100,000; reserve for risks not yet expired, £387,873 18s. 10d.; investment reserve, £57,355 11s. 3d.; pension fund, £41,000; balance at credit of profit and loss account, after payment of dividends, £127,874 13s.; being a total of £1,984,104 3s. 1d.

#### MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).**—Edinburgh Architectural Association. Visit to Torphichen Church. Train leaves Waverley Station for Bathgate at 2.10 p.m.

The parish church at Tadcaster is to be enlarged at a cost of £1,200 to £1,500. The laying of the foundation-stone will take place on June 22nd.

Messrs. Widnell and Trollope have removed from 13, Parliament-street to Broad Sanctuary Chambers, Tothill-street, Westminster, S.W.

The mansion in the Public-parade at Dowsbury has been converted into a museum, and the nucleus of a collection has been got together by a committee. The contents were formally handed over to the corporation on Saturday.

## Trade News.

### WAGES MOVEMENTS.

**CARPENTERS' WAGES ON TEMPORARY JUBILEE STRUCTURES.**—That the current reports published by the daily Press to the effect that carpenters and joiners employed on the wooden stands on the route of the Royal procession are getting half-a-crown an hour is an absurd exaggeration, is evident from the fact that on Monday afternoon the carpenters employed in the erection of the jubilee stand in the churchyard at St. Clement Danes, Strand, struck work for an advance in wages of 2d. per hour, from 10d. to 1s. The men, numbering over 100, were employed by the firm of Messrs. Kirk and Randall, contractors, Woolwich, and, without warning, threw down their tools, and refused to resume work until their demand had been conceded. Delegates were appointed to meet the employers, and it was pointed out on behalf of the men that the carpenters employed in the erection of stands at St. Paul's, Charing Cross, St. Martin's-in-the-Fields, and other places had been conceded the 1s. per hour. Later in the afternoon the firm decided to grant the advance of 2d. per hour, and work was accordingly resumed.

**GREENOCK.**—The master wrights have intimated their willingness to accede an advance of 3d. per hour in wages as requested. The men at first demanded 1d., but this they subsequently modified to one of 3d.

**NORWICH.**—The strike in the building trade in this city is ended, the final agreement being ratified by the signatures of employers and accredited representatives of the trades concerned on May 28. The demands were made in March by the carpenters and joiners, the bricklayers, and the labourers through their unions, and were as follows: the Amalgamated Society of Carpenters and Joiners asked for an alteration in working rule No. 2, which provided for a maximum wage of 7d. an hour for carpenters and joiners, 6½d. an hour for masons and bricklayers, and 4d. an hour for labourers. The carpenters asked that "maximum" should be deleted, and the word "minimum" inserted; the bricklayers asked for a minimum of 7½d.; the labourers wanted a penny an hour advance and a halfpenny extra for scaffolding work. As there is no association of master builders in Norwich, Mr. J. S. Smith, of Lakenham, took the lead, and convened a meeting of employers, with the result that an offer was made of a general advance of a halfpenny an hour, with the deletion of the word "maximum" from the rule. This was accepted, and the men had asked that the changes should come into force on June 1; but the employers suggested September 4; but, after a discussion, July 16 was accepted as the date for the new terms.

**PRESCOT.**—A conference which had been arranged by the Board of Trade official, Mr. John Burnett, was held at the London and North-Western Hotel, Liverpool, on Friday, to consider the joiners' strike in the Prescott district. Mr. W. E. Willink, of the firm of Willink and Thicknesse, architects, of Liverpool, had been appointed arbitrator, and after the matter had been gone into, it was decided that Mr. Brown's works at Whiston were in the Liverpool district, and therefore the men employed there should receive the Liverpool rate of wages—namely, 9d. per hour. Mr. Brown agreed to abide by the result of the arbitration, and the strike is now at an end.

**SCOTTISH BUILDING TRADES' FEDERATION.**—A conference of delegates of trades favourable to the formation of a Scottish National Trades' Federation was held on Saturday in the Trades' Hall, Glasgow. Draft rules were submitted and approved. It is provided in the constitution of the Federation that "when any trade movement is likely to involve a society in a dispute with their employers, the society shall give immediate notice to the secretary of the Federation, and should a strike or lock-out occur, no member or members of the Federation shall do any of the work of the men in dispute, or work on any job where 'black-legs' are brought in to do the work of the men on strike or locked out."

Mr. J. Burbridge, who is at present superintending the construction of the new electrical lines in Leeds, has been recommended by the Electric Works Committee for appointment by the corporation of that city as chief electrical engineer, at a salary of £300 a year.

The Cargo schools, Carlisle, are being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators, and special vertical inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A new church is about to be built at Flookburgh, Lancs, from plans by Messrs. Austin and Paley, of Lancaster. It will be Early English in style, will seat 400 persons, and will cost about £5,000.

## LATEST PRICES.

### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 15 0	to £6 0 0
Rolled-Steel Joists, English.....	6 0 0	to 6 10 0
Wrought-Iron Girder Plates.....	5 15 0	to 6 10 0
Bar Iron, good Staffs.....	7 0 0	to 8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0	to 17 10 0
Do., Welsh.....	5 15 0	to 5 17 6

Boiler Plates, Iron—	
South Staffs.....	7 17 6
Best Snedshill.....	10 0 0
Angles 10s., Tees 20s. per ton extra.	

Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£10 15 0	to £11 0 0
Best ditto.....	11 5 0	to 11 10 0

	Per ton.	Per ton.
Cast-Iron Columns.....	£6 0 0	to £8 10 0
Cast-Iron Stanchions.....	6 0 0	to 8 10 0
Cast-Iron Sash Weights.....	—	to 4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0	to 5 15 0
4in. to 6in.....	5 5 0	to 5 10 0
7in. to 24in. (all sizes).....	4 15 0	to 5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

	Per ton.	Per ton.
Pig Iron—		
Cold Blast, Lilleshall.....	105s. to 110s.	
Hot Blast, ditto.....	57s. 6d. to 62s. 6d.	

Wrought-Iron Tubes—Discount off Standard Lists f.o.b.

	75p.c. Fittings 77p.c.	
Gas-Tubes.....	70	72½
Water-Tubes.....	62½	65
Steam-Tubes.....	60	62½
Galvanised Gas-Tubes.....	55	57½
Galvanised Water-Tubes.....	45	47½
Galvanised Steam-Tubes.....	10cwt. casks.	5cwt. casks.

	Per ton.	Per ton.
Sheet Zinc, for roofing and working up.....	£22 10 0	to £23 15 0
Sheet Lead, 3lb. per sq. ft. super.....	14 0 0	to 14 15 0
Pig Lead, in lwt. pigs.....	13 10 0	to 14 10 0
Lead Shot, in 28lb. bags.....	16 10 0	to 17 0 0
Copper Sheets, sheathing and rods.....	63 0 0	to 63 10 0
Copper, British Cake and Ingots.....	51 15 0	to 53 5 0
Tin, Straits.....	61 5 0	to 61 15 0
Do., English Ingots.....	64 15 0	to 65 5 0
Spelter, Silesian.....	17 10 0	to 18 5 0

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£8 15 0	to £9 15 0
Cut Floor Brads.....	8 10 0	to 9 10 0

	Per ton.	Per ton.
Wire Nails (Points de Paris)—		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9 per cwt.		

### TIMBER.

	per load	£13 15 0	to £16 10 0
Teak, Burmah.....	11 10 0	to 15 10 0	
" Bangkok.....	1 15 0	to 3 15 0	
Quebec pine, pitch.....	5 5 0	to 6 5 0	
" Oak, yellow.....	3 15 0	to 5 10 0	
" Birch.....	4 0 0	to 5 5 0	
" Elm.....	3 5 0	to 4 10 0	
" Ash.....	2 10 0	to 3 10 0	
Danitic and Memel Oak.....	2 15 0	to 4 15 0	
Fir.....	2 0 0	to 4 5 0	
Wainsoot, Riga p. log.....	4 10 0	to 5 10 0	
Lath, Danitic, p.f.....	5 0 0	to 6 10 0	
St. Petersburg.....	8 0 0	to 9 0 0	
Greenheart.....	4 0 0	to 15 0 0	
Box.....	0 1 9	to 0 1 10	
Sequoia, U.S.A. ....per cube foot	0 0 4½	to 0 0 6	
Mahogany, Cuba, per super foot	0 0 4	to 0 0 6½	
lin. thick.....	0 0 4	to 0 0 5	
" Honduras.....	0 0 4	to 0 0 5	
" Mexican.....	0 0 4	to 0 0 5	
Cedar, Cuba.....	0 0 4	to 0 0 5	
" Honduras.....	0 0 4	to 0 0 5	
Satinwood.....	0 0 7	to 0 1 0	
Walnut, Italian.....	0 0 3½	to 0 0 7	
Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. —			

Quebec, Pine, 1st.....	£19 10 0	to £25 10 0
" 2nd.....	14 0 0	to 16 0 0
" 3rd.....	6 10 0	to 10 0 0
Canada Spruce, 1st.....	10 10 0	to 12 0 0
" 2nd and 3rd.....	8 0 0	to 9 10 0
New Brunswick.....	7 10 0	to 8 5 0
Riga.....	7 10 0	to 8 10 0
St. Petersburg.....	9 10 0	to 13 10 0
Swedish.....	9 0 0	to 16 10 0
Finland.....	9 0 0	to 9 10 0
White Sea.....	10 10 0	to 17 0 0
Battens, all sorts.....	5 0 0	to 20 0 0

yellow	1 15 0	3 15 0
Oak	5 5 0	6 5 0
Birch	3 15 0	5 10 0
Elm	4 0 0	5 5 0

" Ash .....	" ...	3 5 0	"	4 10 0
Dantsic and Memel Oak	" ...	2 10 0	"	3 10 0
Fir .....	" ...	2 15 0	"	4 15 0
Wainscot, Riga p. log ...	" ...	2 0 0	"	4 5 0

### OILS.

	per ton	£14 7 6	to £15 0 0
Linseed.....	26 5 0	to 26 10 0	
Rapeseed, English pale.....	23 10 0	to 26 15 0	
Do., brown.....	14 10 0	to 15 0 0	
Cottonseed ref.....	29 0 0	to 29 15 0	
Olive, Spanish.....	23 0 0	to 24 0 0	
Seal, pale.....	27 10 0	to 27 15 0	
Cocanut, Cochin.....	23 5 0	to 23 10 0	
Do., Ceylon.....	20 10 0	to 22 10 0	
Palm, Lagos.....	19 0 0	to 20 0 0	
Oleine.....	0 6 3	to 0 7 6	
Lubricating U.S..... per gal.	0 4 9	to 0 6 6	
Do., black.....	1 2 0	to 1 5 0	
Tar, Stockholm..... per barrel	0 12 6	to 0 15 0	
Archangel.....	21 0 0	to 21 10 0	
Turpentine, American... per ton	21 0 0	to 21 10 0	



## LIST OF COMPETITIONS OPEN.

Hipperholme—Urban District Council Offices (£2,000 limit) .....	£10	J. E. and E. H. Hill, Clerks U.D.C., 4, Harrison-road, Halifax .....	June 7
Shaw—Sunday School, Rochdale-road .....		Rev. F. W. Nicholson, 10, Refuge-street, Shaw .....	" 14
Morecambe—Hotel Metropole .....	£100 (merged), £50, £25, and £15	Baxter and Abbott, Back-crescent, Morecambe .....	" 16
West Hartlepool—Laying out Burn Valley Pleasure Gardens .....		J. W. Brown, Borough Engineer, West Hartlepool .....	" 29
Elne, France—Water Supply Scheme (3,300 inhabitants) .....		La Marie, Elne, Pyrenées Orientales .....	July 1
Howth—Presbyterian Church .....	£20 (merged) and £10	Rev. James Wilson, 4, Rhoda Villas, Howth, Co. Dublin .....	" 20
Rugby—Municipal Buildings (no Assessor) .....	30gs. (merged), 20gs.	D. G. Macdonald, Surveyor, Rugby .....	" 21
Bootle—Technical School, Balliol-road (£15,000 limit) .....	50gs., 30gs., 20gs.	J. A. Crowther, Borough Engineer, Bootle .....	" 31
Carlton, Victoria—Children's Hospital .....	£100, £50, £25	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia (1908) .....	Jan. 30
Bury, Lancs—Art Gallery and Free Library .....		The Town Clerk, Bury, Lancs .....	"
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit) .....	£25, £10	Borough Surveyor, Salter Gate, Chesterfield .....	"
Wadhurst, Tunbridge Wells—Vicarage Hall (£1,500 limit) .....		Secretary Jubilee Committee, Wadhurst, Kent .....	"
Huddersfield—Jubilee Tower on Castle Hill .....		Secretary Jubilee Committee, Town Hall, Huddersfield .....	"

## LIST OF TENDERS OPEN.

## BUILDINGS.

Bridge of Orchy, N.B.—Schoolhouse .....	School Board	Kennett McRae, 5, Argyll-street, Oban .....	June 5
Chapel-en-le-Frith—Workhouse Additions .....	Board of Guardians	B. Boycoll, Clerk, Chapel-en-le-Frith .....	" 5
Earlheaton—Two Houses .....		J. H. Brearley, Architect, Hanover-street, Batley .....	" 5
Dewsbury—Four Through Houses, Clarke-street .....		R. Watson, Architect, Bradford-road, Batley .....	" 5
Glaistdale—Schools and House .....	School Board	E. H. Smales, A.R.I.B.A., 5, Flowergate, Whitby .....	" 5
Brislington—Shop and House, Wilk-road .....		Matcham and Co., 44, High-street, Bristol .....	" 5
Barnsley—Mission Church, Farrar-street .....	Congregational Trustees	Hemson and Paterson, Architects, 18, Norfolk-road, Sheffield .....	" 5
Bridport—Fever Hospital, North Allington .....	Corporation	C. G. Nantes, Town Clerk, Bridport .....	" 5
Treharris—Pair Semi-Detached Cottages .....		W. Dowdeswell, Architect, Treharris .....	" 5
Stanley—Enlarging St. Peter's Schools .....		W. Watson, Architect, Barston-square, Wakefield .....	" 5
South Bank—House and Shop .....	A. Fulton	W. Duncan, Architect, 3, Zetland-road, Middlesbrough .....	" 5
Rochdale—Belfield Board School .....		G. H. Wheeler, Clerk to School Board, Rochdale .....	" 5
Pudsey—Four Houses and Shops, Lowtown .....		G. Verity, Lowtown, Pudsey .....	" 5
Edinburgh—Alterations to 323, High-street .....	Corporation	R. Morham, Superintendent of Works, City Chambers, Edinburgh .....	" 5
Ellon, N.B.—Cottage .....	Alex. Wright	Wm. Davidson, Architect, Ellon .....	" 5
Faringdon—Post Office .....		Wm. Drew, M.S.A., 22, Victoria-street, Swindon .....	" 5
Hebden Bridge—Warehouse in Croft-road .....		W. Wrigley, M.S.A., Crossley-terrace, Hebden-bridge .....	" 5
Newcastle-on-Tyne—Premises, Gresham-place .....	Eastmans Company	Oliver and Leeson, Architects, Newcastle .....	" 5
Mosser—Vestry at Church .....		Rev. T. P. Moorhouse, Mosser Vicarage .....	" 5
Londonderry—Library, Hall, and Baths, St. Columb's College .....		E. J. Toye, Architect, Londonderry .....	" 5
Irchester—Enlarging Working Men's Club .....		G. Bowen, Secretary, Irchester .....	" 5
Inverkindle—Two Cottages and Shop .....	Urban District Council	Jenkins and Marr, Architects, Aberdeen .....	" 5
Ashton-in-Makerfield—Additions to Depot .....		Jas. Hill, Clerk, Ashton-in-Makerfield .....	" 6
Rotherham—Children's Wards at Hospital .....		J. R. Webster, Architect, 19, St. James's-street, Sheffield .....	" 7
Longsight—Chapel .....	Wm. Westlake	T. D. Linden, Architect, Ashton-under-Lyne .....	" 7
Barton, Manchester—Patent Fuel Works .....	Trustees	C. T. Rutley, C.E., Bank Chambers, Swansea .....	" 7
High Littleton—Wesleyan Sunday School .....		W. F. Bird, M.S.A., Midsomer, Norton .....	" 7
Morecambe—Brick Chimney 129ft. in height, Engine and Boiler Houses .....	Urban District Council	John Bond, Surveyor, Council Offices, Morecambe .....	" 7
Forres, N.B.—Two Cottages and Bakery .....		B. Walker, Altyre, Forres .....	" 7
Rugby—Additions, School Sanatorium .....		J. T. Franklin, Architect, 40, Bridget-street, Rugby .....	" 7
Newark—House in London-road .....	Wm. Manby	Sheppard and Harrison, Architects, 17, Kirkgate, Newark .....	" 8
Runcorn—Alterations, Town Hall .....	Urban District Council	E. Marshall, Secretary, Town Hall, Runcorn .....	" 8
Rowland's Gill—Cottage .....		R. Younger, 30, High-street, Gosforth, Newcastle .....	" 8
Balham—Branch Free Library, Ramsden-road .....	Sreatham Library Commissioners	T. Everatt, Clerk, Tate Library, Sreatham .....	" 8
Cairnbulg, N.B.—Additions to Offices .....	Corporation	Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen .....	" 8
Gloucester—Additions to Technical Schools, Brunswick-street .....		The Town Clerk, Guildhall, Gloucester .....	" 8
Whitehaven—Alterations, 48, Church-street .....	Board of Guardians	Moffatt and Bentley, Architects, Whitehaven .....	" 8
Leeds—Sanitary Additions to Workhouse .....	Yorkshire Ice Company	T. Winn, Architect, 90, Albion-street, Leeds .....	" 8
Benfields—Excavating Storage Cellars .....		E. W. Darby, Secretary, 1, Cheapside, Leeds .....	" 8
Benfieldside—Works to Board Schools .....		G. T. Wilson, Architect, 121, Durham-road, Blackhill .....	" 8
Kingswood—Reformatory School .....	North Dublin Guardians	H. C. M. Hirst, A.B.I.B.A., 30, Broad-street, Bristol .....	" 9
South Raheny, Howth—Six Labourers' Cottages .....		J. O'Neill, Clerk, North Brunswick-street, Dublin .....	" 9
Halifax—Three Pairs Semi-Detached Villas, Savile Park .....	Younger and Co.	Medley Hall, Architect, 29, Northgate, Halifax .....	" 9
Darlington—Additions, Black Swan Hotel .....		Wm. Duncan, Architect, 3, Zetland-road, Middlesbrough .....	" 9
Whitehaven—Post Office .....		J. G. Dees, Somerset House, Whitehaven .....	" 9
Melksham—Masonic Hall .....	F. Scott	J. A. Randall, M.S.A., Exchange-place, Devizes .....	" 9
Pontefract—Two Houses, Bank's-avenue .....	Co-operative Society	Garside and Keyworth, Architects, Pontefract .....	" 9
Longridge, Lancs—Stable Buildings .....	North Dublin Guardians	W. Riding, Secretary, Berry-lane, Longridge .....	" 9
Upper Kibbarrack—Three Labourers' Cottages .....	Board of Guardians	J. O'Neill, Clerk, North Brunswick-street, Dublin .....	" 9
Aylesbury—Repairs to Workhouse .....	J. Rowlands	F. B. Parrott, Clerk, 16, Bourton-street, Aylesbury .....	" 10
Llangennech—House and Shop .....	Scottish Provident Institution	J. Davies and Sons, Cowell House, Llanelli .....	" 10
Belfast—Premises, Donegal-square West .....	Corporation	Young and Mackenzie, Donegal-square East, Belfast .....	" 10
Leeds—Alterations to Meadow-lane Gasworks .....		R. H. Townsley, Gen. Superintendent, Municipal Buildings, Leeds .....	" 10
Morley—Primitive Methodist Chapel, Bridge-street .....	Board of Guardians	T. A. Buttery, Architect, Queen-street, Morley .....	" 10
Stafford—Alterations, Lying-in Wards .....	G. M. Jennings	N. Joyce, Architect, Stafford .....	" 10
Kendal—House and Premises, Sandal's-avenue .....	Gas Company	S. Shaw, F.R.I.B.A., Kendal .....	" 10
Hipperholme—Stabling and Cart-Shed .....	Managers	Jackson and Fox, Architects, 22, George-street, Halifax .....	" 10
Guildford—Buildings for Water-Gas Apparatus .....	Rev. Theo. Landey	Mark Smallpeice, Chairman of Company, Guildford .....	" 11
Abergavenny—Classroom, Park-lane Schools .....	Miss Mary Totham	E. A. Johnson, M.S.A., Abergavenny .....	" 11
Foxford—Glebe House .....	Ashby and Co., Staines	J. G. Skipton, Architect, Northgate-street, Athlone .....	" 12
Bunney Church—New Roof, North Aisle .....	Corporation	The Vicar, Bunney .....	" 12
Southminster—House .....	Building Committee	B. Totham, Southminster .....	" 12
Egham—Rebuilding Catherine Wheel Hotel .....	Co-operative Society	Wm. Menzies, Eaglefield-green, Surrey .....	" 12
Windermere—St. John's Vicarage .....	Stone Bridge Trustees	J. F. Curwen, F.R.I.B.A., 51, Highgate, Kendal .....	" 12
Deal—Ladies' Cloakroom and Covered Shelter .....	Ystradyfodwg School Board	T. C. Golder, Borough Surveyor, 16, High-street, Deal .....	" 12
South Queensferry, N.B.—Swimming Baths .....	Hornsey U.D.C.	J. M. Henry, Architect, 7, South Charlotte-street, Edinburgh .....	" 12
Barrow—Beaconsfield Club, Abbey-road .....	Trustees	J. Y. McIntosh, Architect, 6, Cornwallis-street, Barrow .....	" 12
Hampton-on-Thames—Shop and Bakery .....	Glamorgan Agricultural Society	G. F. Duke, Secretary, Hampton .....	" 12
Edenbridge—House and Shop .....	Devon County Council	G. Pullinger, Clerk, Bridge House, Edenbridge .....	" 14
Grimsby—Jubilee Provident Homes .....	Brighton Board of Guardians	H. C. Scaping, Architect, Grimsby .....	" 14
Pentre Llondda—School .....	Board of Guardians	W. G. Howell, Clerk, Pentre .....	" 14
Muswell Hill—Greenhouse (60ft. by 12ft.), Irish Corner .....	Gas Co.	F. D. Askey, Clerk, 99, Southwood-lane, Highgate .....	" 14
Bradford—Block of Shops, Manningham-lane .....	Kent County Council	Mawson and Hudson, Architects, 2, Exchange-buildings, Bradford .....	" 14
Normanton—Hopetown Primitive Methodist Chapel .....	Co-operative Society	A. Hartley, Architect, Carlton Chambers, Castleford .....	" 14
Swansea—Shedding, Stands, &c. .....	Co-operative Society	W. V. Huntley, Secretary, Welsh St. Donatt's .....	" 15
Treleth—School Additions .....	Royal Insurance Company	Rev. J. A. Roberts, Ireleth Vicarage, Askam-in-Furness .....	" 15
Ashridge—Reconstructing Kershaw Bridge .....	Corporation	H. Michellmore, Clerk, The Castle, Exeter .....	" 15
Rottingdean—Alterations, Warren Farm Schools .....	Rev. F. Doherty	J. G. Gibbins, F.R.I.B.A., Palace-place, Brighton .....	" 15
Dewsbury—Two Cottage Homes, Heads-road .....	Urban District Council	Holtom and Fox, Architects, Westgate, Dewsbury .....	" 17
Delph—Shed and Store-room, Rasing Mills .....	Industrial Provident Society	Kirk and Sons, Architects, Huddersfield .....	" 17
Barking—Retort and Boiler Houses, Gasworks .....		Secretary, 55, High Holborn, W.C. .....	" 17
Chartham—Additions to Asylum .....		W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury .....	" 18
Denny, N.B.—Thirty-six Small Houses .....		R. M'Lelland, Architect, Motherwell-road, Bellshill .....	" 19
Oswestry—Alterations to Conservative Club .....		Shaylor and Madoc-Jones, Architects, 19, Church-street, Oswestry .....	" 19
Denny—Thirty-six Dwellings .....		R. M'Lelland, Architect, Motherwell-road, Bellshill .....	" 19
Leven, N.B.—Hotel .....		J. P. Guthrie, Solicitor, High-street, Kirkcaldy .....	" 23
Liverpool—Offices, North John-street .....		J. F. Doyle, Architect, 4, Harrington-street, Liverpool .....	" 24
Salford—Block 66 Artisans' Dwellings .....		S. Brown, Town Clerk, Salford .....	" 24
Augher—Alterations to House .....		Thos. Elliott, Architect, Augher, Co. Tyrone .....	" 25
Hampton-on-Thames—Sewage Outfall Buildings .....		F. A. Kent, Clerk, Hampton .....	" 25
Corsham—Additions to Manor House .....		T. Holloway, Chippenham .....	" 25
Beamish—Sixteen Houses .....		T. E. Crossling, Architect, Front-street, Stanley .....	" 31
Burnley—Rebuilding Church Institute .....		Thos. Bell, Architect, Burnley .....	"
Belfast—Business Premises, Berry-street .....		W. J. Moore, Architect, Whitehall Buildings, Belfast .....	"
Witton Gilbert—Institute .....		Secretary Consett Iron Co., Blackhill, Co. Durham .....	"



## BUILDINGS—continued.

Hawker—House and Stables	S. Rhodes	J. J. Milligan, Architect, 77, Baxtergate, Whitby
Dukinfield—Offices, Half-Moon-street	John Stafford, Town-lane Ropery, Dukinfield	Colliery Offices, Denaby Main, Rotherham
Denaby Main—100 Large and 50 Small Cottages	Leys's Malleable Casting Co.	E. R. Ridgway, Architect, Long Eaton
Derby—Alterations to Vulcan Ironworks		Oliver and Leeson, Architects, Mosley-street, Newcastle-on-Tyne
Sacristy—South Aisle, &c., St. Peter's Church		The Works, Penarth
Penarth—Chimney Stack at Cement Works	Co-operative Society	Rev. L. Lewis, Ockbrook Vicarage, Derbyshire
Ockbrook—Resealing of Parish Church	Select Vestry	S. Butterworth and Duncan, 4, South Parade, Rochdale
Norden—Liberal Club		Davidson and Bendle, Archts., Grainger-st. W., Newcastle-on-Tyne
Newbiggin-by-Sea—Stores		Wm. J. M'Keown, architect, Banbridge
Knocknamuckley—Parochial Hall		C. Fowler, Surveyor, 24, Basinghall-street, Leeds
Leeds—Villa at Roundhay		Edw. Dunphy, Mount Sion, Kilkenny
Kilkenny—Cottage	John Kenyon, Ltd.	C. H. Openshaw, Architect and Surveyor, Fleet-street, Bury
Birle, Lanes—Vicrage	School Board	Alfred Taylor, Alma Villas, Bolton
Bolsover—Alteration to Two Shops in Market-place		Charles Parsons, Architect, 9, Grimshaw-street, Burnley
Bacup—Alterations, Thorn Inn and Butchers' Arms		G. H. White, Clerk, Woking
Woking—Goldsmith Schools		J. Poulton, Pontnewydd
Pontnewydd—Rebuilding Three Shops	Corporation	E. H. Lingen Barber, Architect, 146, St. Owen-street, Hereford
Trudoxhill, Nunney—Mission Church	Corporation	City Engineer, Town Hall, Leeds
Leeds—Battery Station at Kirkstall	T. Cromack	City Engineer, Town Hall, Leeds
Leeds—Alterations, Entrance, Roundhay Park	Joseph King	F. W. Rhodes, Architect, Upper Wortley, Leeds
Holbeck—Ten Houses		Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne
Dukinfield—Villa, Higher King-street	Dorset Asylum Committee	W. W. Robinson, Architect, 10, King-street, Hereford
Hereford—Eight Cottages, Ryeland-street		T. Coombs, Clerk, 5, South-street, Dorchester
Charmminster—Four Pairs of Cottages	Steam Laundry Co.	Thos. Nuttall, Architect, 20, Market-street, Bury
Bury, Lanes—Mission Room, Clerk-street		Mitchell and Ford, Architects, 2, Langney-road, Eastbourne
Eastbourne—Extension Boiler House, &c.		Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne
Dukinfield—Additions, Wellington-street Schools		James Bunce, Turner's Hill, Cheshunt
Cheshunt—Three Villas and Offices	Board of Guardians	A. Hart, Architect, 21, Barstow-square, Wakefield
Flanshaw—Resealing Congregational Chapel		Kerley and Ellis, Architects, Exmouth
Exmouth—Two Shops, Exeter-road	F. W. P. Orchard	T. D. Lindsay, Architect, Ashton-under-Lyne
Ashton-under-Lyne—Spinning Sheds, Oxford Mills		E. C. H. Maidman, Architect, 15, South Charlotte-street, Edinburgh
Colington, Edinburgh—Villa		Empsell and Clarkson, Architects, 7, Exchange, Bradford
Denaby—St. Alban's Church and Presbytery		W. H. Walley, Architect, Burslem
Chell, Staffs—Additions to Workhouse		Jas. Bunce, Turners Hill, Cheshunt
Cheshunt—Three Villas		F. H. Goddard, Architect, Lincoln
Bracebridge—Additions to Asylum	School Board	T. George and Son, Old-square, Ashton-under-Lyne
Ashton-under-Lyne—Two Houses in Fraser-street	Mayfield and Co.	E. J. Toye, Architect, Strand, Derry
Augebrack—Finishing Church	Co-operative Society	Secretary, St. George's College, Adlestone
Addlestone—Additions to Collegiate Building	Rev. J. P. McCarthy	F. Watts, 27, Lordship-lane, Tottenham
Tottenham—117 Cottages	Brick Co.	A. J. Wilsdon, John-street, Kilkenny
Kilkenny—Additions to Royal Oak Inn		Bromet and Thorman, Architects, Tadcaster
Kippax—Boys' School		T. Brownlow Thompson, Architect, 15, Parliament-street, Hull
Hull—Additions to Stepney Paper Mills		T. George and Son, Old-square, Ashton-under-Lyne
Ashton-under-Lyne—Three Houses in Carrier-lane		E. R. Ridgway, M.S.A., Long Eaton
Stapleford—Two Shops		Jas. Hart, Architect, Corby, Grantham
Ilkeston—Schools, Regent-street		F. H. Cooke, Surveyor, Peterborough
Peterborough—Three Houses at Farcet		A. Wyatt 97, High-street, Poole
Poole—Two Semi-Detached Villas		George Hobson, Witton Gilbert, Co. Durham
Witton Gilbert—Eight Houses		A. Stockwell, Architect, 11, Pilgrim-street, Newcastle-on-Tyne
Whitley—Eight Houses		T. George and Son, Old-square, Ashton-under-Lyne
Ashton-under-Lyne—House in Grafton-street		Hicks and Charlewood, Archts., 42, Grainger-st., Newcastle-on-Tyne
Terrington St. Clement—Church Restoration	E. T. Hooley	E. R. Ridgway, M.S.A., Long Eaton
Long Eaton—Nine Villas and Shop, Scoley-road	R. C. Bland	A. Wyatt 97, High-street, Poole
Poole—Two Semi-Detached Villas		Geo. Bland, Architect, Harrogate
Pateley Moor—Farmhouse		J. A. York, Solicitor, Barnard Castle
Newsham—Re-erection of Farm Buildings		E. Rogers, Trelowarren-street, Camborne
Camborne—Five-roomed House, College-row		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle
Carlisle—Hayton Hall and Reading-room	E. T. Hooley	E. R. Ridgway, M.S.A., Long Eaton
Long Eaton—34 Semi-Detached Houses, Beaconsfield-street	J. Oats	Opie's Temperance Hotel, Penzance
Marazion—House		F. Moore, 40, Sundridge-road, Bradford
Bradford—Four Through Houses, Newark-street		C. F. Watson, Grey Southern, Cockermouth
Maryport—Washhouses	E. T. Hooley	E. R. Ridgway, M.S.A., Long Eaton
Long Eaton—24 Houses, Salisbury-street		S. Richards, Architect, 3, Market-place, Ilkeston
Ilkeston—Enlargement of Primitive Methodist Chapel	Mawson and Swan	J. W. Rounthwaite, A.R.I.B.A., 15, Mosley-street, Newcastle
Gateshead—Factory, The Teams		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle
Carlisle—Alterations to 23, Warwick-road		W. H. Sharp, Architect, 229, Rooley-lane, Bradford
Bradford—Four Houses, West Bowling		F. Moore, 40, Sundridge-road, Bradford
Bradford—Additions, Hope and Anchor Hotel, Park-road	T. Williams	E. A. Johnson, M.S.A., Aberystwyth
Blaenavon—Additions, Wain Hotel		C. H. Openshaw, Architect, Fleet-street, Bury, Lanes
Bowlee—Rebuilding Jolly Butcher Inn		W. H. Higginbotham, Architect, King John's Chambers, Nottingham
Beeston—Four Houses		

## ENGINEERING.

Birmingham—Hydraulic Lift, Council House	Corporation	J. Price, City Surveyor, Birmingham	June 5
Brussels—Local Light Railways, Les Engghien to Soignies		Secretary of Local Railways, 15, Rue de la Science, Brussels	" 7
Bulgaria—Railway from Rustchuk to Tirnov	Bulgarian Government	Ministry of Public Works, Sofia	" 7
Handsworth—Electrical Plant	Urban District Council	H. Ward, Clerk, Soho-road, Handsworth	" 7
Annan, N.B.—Laying Main to Corschill	Burgh Commissioners	Murray Little, Clerk, Annan	" 8
Patcham and Preston—Laying 5 miles 15in. C.I. Mains	Brighton Waterworks Committee	F. J. Tilstone, Town Clerk, Brighton	" 8
Newport, Isle of Wight—Sinking Well at Asylum		F. Newnam, County Surveyor, 5, St. Thomas-street, Ryde	" 9
Accrington—Brick Reservoir (1,000,000 gal.), Smalley Thorn	Gas and Water Board	A. H. Aitken, Clerk, St. James's-street, Accrington	" 9
Hemsworth—Covered Service Reservoir, Ringstone Hill	Rural District Council	J. Scholefield, Clerk, Hemsworth, Wakefield	" 9
Hemsworth—Sluice Valves, Hydrants, &c.	Rural District Council	J. Scholefield, Clerk, Hemsworth, Wakefield	" 9
Penarth—Bridge over Railway	Taff Vale Railway Co.	H. Clarke, Secretary, Cardiff	" 10
Yarmouth, Isle of Wight—Yar Bridge Repairs		Newman and Cocks, Engineers, 5, St. Thomas's-street, Ryde	" 10
Hedley—Water Supply	Hexham Rural District Council	A. S. Dinning, 25, Ellison-place, Newcastle	" 10
Leeds—Hydraulic Mains at Gasworks	Corporation	R. H. Townsley, General Supt., Municipal Buildings, Leeds	" 10
Gubardletter, Ashill—Timber Jetty		H. Williams, Secretary, Office of Public Works, Dublin	" 14
Brighton—Electric Light Wiring, Municipal Technical Schools	Corporation	F. J. Tilstone, Town Clerk, Brighton	" 14
Ardeley Point, Blackod Bay—Timber Jetty		H. Williams, Secretary, Office of Public Works, Dublin	" 14
Grindleton—Filter Bed, Bowker Park	Clitheroe Corporation	J. E. Sharpe, Borough Engineer, Clitheroe	" 14
Belmullet, Blackod Bay—Timber Jetty		H. Williams, Secretary, Office of Public Works, Dublin	" 14
Fenton, Staffs.—Brick Culvert	Urban District Council	S. A. Goodall, Surveyor, Town Hall, Fenton	" 15
Wallasey—River Wall and Promenade (1,350 yards)	Urban District Council	W. Danger, Clerk, Egremont	" 15
Ashford, Kent—Covered Service Reservoir and Water Tower, Barrow Hill	Urban District Council	John Creery, Deputy Clerk, Ashford, Kent	" 18
Queenstown—Waterworks	Sanitary Authority	J. H. Campbell, Clerk, Town Hall, Queenstown	" 21
Limehouse—Graving Dock, Union Docks		W. Jaffory, M.Inst.C.E., 3, Victoria-street, S.W.	" 21
Wootton Bassett and Patching—Railway (33½ long)	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 22
Longan Water, N.B.—Reservoir and C.I. Main	Lanark District Committee	Leslie and Reid, C.E.'s, 72A, George-street, Edinburgh	" 23
Thornbury—Relaying Gas Mains (1,120 yards)	Gas Co.	S. Fudge, Secretary, Thornbury, Glos.	" 23
Sydney, N.S.W.—4 Separate Duplicate Electric Lighting Plants		Hy. Goodwin, Anderton's Hotel, Fleet-street, E.C.	" 23

## FENCING AND WALLS.

Christchurch, Hants—Wire Fencing Cottage Homes (1,800 yds)	Board of Guardians	A. Druiitt, Clerk, High-street, Christchurch	June 5
Silloth—Concrete Walls (200 yards), Eastcote		Robert Stubbs, Surveyor, Abbey Town, Carlisle	" 8
Wicklow—Boundary Walls to Convent		Rev. Mother Prioress, the Convent, Wicklow	" 17
Denholme—Boundary Walls to Wesleyan Schools		Judson and Moore, Architects, Keighley	" 17

## FURNITURE AND FITTINGS.

Castlebar—Iron Bedsteads, Garden Seats, &c.	Lunatic Asylums Board	Thomas Griffiths, Clerk, Castlebar District Asylum	June 8
Folkestone—Sidney-street Schools	School Board	A. H. Gardner, Clerk, 8A, Cheriton-place, Folkestone	" 9
Walthamstow—Coppermill-road Board School		T. W. Lidiard, Clerk, High-street, Walthamstow	" 15
Dulwich—Free Library, Lordship-lane (Internal Fittings, Fixtures, and Furniture)	Camberwell Vestry	C. W. Tagg, Vestry Clerk, Vestry Hall, Camberwell	" 21

## PAINTING.

Wark and Ingram Bridges—Painting	Northumberland County Council	County Surveyor, Moot Hall, Newcastle-on-Tyne	June 5
Treeton to Bolsover—All Stations, &c.	Midland Railway Co.	Secretary, Way and Works Committee, Midland Railway, Derby	" 5
Fochriw—All Board Schools		Rev. Jas. Jones, Secretary, Fochriw	" 8
Middlesbrough—Sanatorium	Corporation	F. Baker, Borough Engineer, Middlesbrough	" 8
Cardiff—Painting all Bridges	Corporation	J. L. Wheatley, Town Clerk, Cardiff	" 8



## PAINTING—continued.

Harrow-road Workhouse Infirmary	Paddington Board of Guardians	H. F. Aveling, Clerk, 289, Harrow-road, W.	June 9
Ashford, Middlesex—Exterior District Schools	Managers	C. D. Hume, Clerk, Ashford, Middlesex	11
Colchester—Cavalry Barracks (Exterior and Interior)	War Department	Col. Commanding R.E. Colchester	12
Wanstead—Board Schools	School Board	Wm. Blewitt, Clerk, School Board Offices, Wanstead	14
Chelsea—Workhouse Infirmary, Cale-street	St. Luke's, Chelsea, Guardians	Wm. Miller, Clerk, 250, King's-road, S.W.	15
Chelsea—Casual Wards, Millman-street	St. Luke's, Chelsea, Guardians	Wm. Miller, Clerk, 250, King's-road, S.W.	15
West Ham—Painting and Repairs, Five Schools	School Board	C. W. Carrell, Clerk, Broadway, Stratford	16
Swindon—All Board Schools	Fulham Union	W. Seaton, Clerk, Public Offices, Swindon	16
Hammersmith—Infirmary, St. Dunstan's-road		T. Apin Marsh, Clerk, Guardians' Offices, Fulham Palace-road, W.	16
Stockton—Redecorating Grand Theatre and Hotel		Wm. Durland, Lessee, Stockton-on-Tees	24

## ROADS AND STREETS.

Dewsbury—Paving Hartley-street	Corporation	G. T. Lee, Town Clerk, Dewsbury	June 5
Ribchester—Repaving Back-street	Preston Rural District Council	E. H. Barber, Surveyor, Saul-street, Preston	5
Guildford—Making-up Roads	Corporation	F. Smallpeice, Town Clerk, Guildford	5
Kingstown—Roadways, Eden-road	Commissioners	J. Donnelly, Town Clerk, Kingstown, co. Dublin	7
Peckham—Paving Frensham-street	Camberwell Vestry	O. S. Brown, Surveyor, Vestry Hall, Camberwell	8
East Finchley—Roads, Islington Cemetery	Islington Vestry	J. P. Barber, M.L.C.E., Upper-street, Islington	9
Spennymoor—Making-up Highway Footpaths	Urban District Council	F. Badcock, Clerk, 8, James-street, Spennymoor	9
Farnborough—Making-up Reading-road	Urban District Council	R. W. Knapp, Surveyor, Farnborough	9
Elgin—Concrete Paving Reidhaven-street	Town Council	D. Macintosh, Burgh Surveyor, Elgin	11
Arnold, Notts—Paving High-street and Culverton-road	Urban District Council	C. J. Spencer, Clerk, Basford	12
Southampton—Tar Paving at Three Schools (5,500sq.yds.)	School Board	J. Cruikshank, Clerk, St. Mary's-road, Southampton	14
London, W.—Repaving Yard, Cleveland-street Asylum	Central Sick Asylums Board	F. W. Bailey, Clerk, Cleveland-street, W.	14
Hurst, Lancs—Street Works	Urban District Council	J. Whitworth, Clerk, Booth-street, Ashton-under-Lyne	16
Clacton-on-Sea—Making-up Wellesley, Thoroughgood, and Vista Roads	Urban District Council	A. R. Robinson, Surveyor, Town Hall, Clacton	16
Ashford, Kent—Making-up Christchurch-road	Urban District Council	John Creery, Deputy Clerk, Ashford, Kent	18
Friern Barnet—Making-up Goldsmith-road	Urban District Council	E. Goodship, Surveyor, Friern Barnet	23
Eccles—Paving in Barton-lane	Corporation	G. W. Bailey, Town Clerk, Town Hall, Eccles	24
Blaina, Mon.—New Road through Rectory Fields	Nantyglo Ironworks Co.	Adams and Vachell, Engineers, Newport, Mon.	—
Bradford—Street Forming, West Bowling		W. H. Sharp, Architect and Engineer, 239, Rooley-lane, Bradford	—

## SANITARY.

Southampton—Public Convenience, High-street	Corporation	G. B. Nalder, Town Clerk, Southampton	June 8
Southend-on-Sea—Sewerage Works	Corporation	W. Gregson, Town Clerk, Alexandra-road, Southend-on-Sea	9
Blackpool—Main Sewer, Mere-road to Dickinson-road	Corporation	J. Wolstenholme, Borough Surveyor, Blackpool	10
Wibsey—Sewers	Spilsby Rural District Council	F. J. Dixon, District Surveyor, Spilsby	12
Merton—Drains, Kingston-road	Urban District Council	P. Ross, C.E., Council Offices, Wibsey, Bradford	14
Watford—Buildings, Engines, Ejectors, and Mains, Sewage Works	Croydon Rural Sanitary Authority	Jas. Wilson, Clerk, 49, London-road, Croydon	23
Kettering—Sewage Disposal Ironwork	Urban District Council	H. Morten Turner, Clerk, 66, High-street, Watford	23
Oporto—Drainage Works	Urban District Council	T. Reader Smith, Surveyor, Market Hill, Kettering	26
Ardagh—Drainage Works at Creamery	Municipality	The President, Municipality, Oporto	July 31
Putney—Laying Rain-water Pipe Sewers (1,000ft., 12in.), Upper Richmond-road	Co-operative Dairy Society	J. Horan, M.L.C.E., 50, George-street, Limerick	—
Epperstone—Sewering	H. Shepherd-Cross, M.P.	F. H. Harvey, F.S.I., 183, Lavender Hill, S.W.	—
	Southwell Rural District Council	E. R. Ridgway, M.S.A., Long Eaton	—

## STEEL AND IRON.

Oswestry—C.I. Chairs (500 tons)	Cambrian Railway Co.	R. Brayne, Secretary, Oswestry	June 8
Hemsworth—Socketed C.I. Pipes (over 45,000 yards)	Rural District Council	J. Schofield, Clerk, Hemsworth, Wakefield	9
Watford—C.I. Water-Mains	Urban District Council	H. M. Turner, Clerk, Watford	9
Gleynecorrig—C.I. Pipes (5,300 yards 3in. and 4in.)	Urban District Council	G. F. Lambert, Engineer, Bridgend	9
Rochdale—Two C.I. Tanks	Corporation	Jas. Leach, Deputy Town Clerk, Rochdale	9
Ryton-on-Tyne—Water-Pipes and Pipe-Laying	Urban District Council	J. P. Dalton, Engineer, Ryton-on-Tyne	9
Hornsey—100 Street Lanterns	Urban District Council	F. D. Askey, Clerk, 99, Southwood-lane, Highgate	14
Longford—Ironwork and Roofing, Sanitary Department	Warrington Corporation	J. Deas, Sankey-street, Warrington	14
Salisbury—Corrugated Iron Roof	Gas Co.	N. H. Humphrys, Gas House, Salisbury	15
Barking—W.I. Roof to Retort-House	Gas Co.	Secretary, 55, High Holborn, W.C.	17
Uitenhage—16in. C.I. Pipes (1,325 tons)	Corporation	P. Thomson, Town Clerk, Uitenhage, Cape Colony	July 1

## STORES.

Glasgow—Brick, Clay, Lime, Wire, &c. (one year)	Caledonian Railway Co.	J. Blackburn, Secretary, 302, Buchanan-street, Glasgow	June 7
Belfast—Welsh Square Setts (5,000 tons)	Harbour Commissioners	W. A. Currie, Secretary, Harbour Offices, Belfast	7
Chadderton—Road Materials (One Year)	Urban District Council	G. Taylor, Clerk, Chadderton	7
East Ham—Broken Granite and Norway Granite Kerb	Urban District Council	J. Savage, Surveyor, Wakefield-street, East Ham	8
Brighton—Portland Cement (One Year)	Corporation	F. J. Tillstone, Town Clerk, Brighton	11
Mexico—Steel Sleepers and Rails	Mexican Railway Co.	J. T. Dinniston, Secretary, 45, New Broad-street, E.C.	11
Brighton—Spalls (5,000 tons)	Corporation	F. J. Tillstone, Town Clerk, Brighton	11
Manchester—Solid Rock Haslinden Grit Setts	Highways Committee	Chief Clerk, Highways Department, Town Hall, Manchester	—
Morley—Granite, Limestone, Setts, &c. (One Year)	Corporation	M. H. Sykes, Borough Surveyor, Morley	—
Southwark—Sewer Ironwork (to March 25, 1900)	St. George the Martyr Vestry	J. A. Johnson, Vestry Clerk, 81, Borough-road, S.E.	—

## CHIPS.

A congress of sanitary inspectors will be opened at Aberdeen, on the 17th inst.

The annual excursion of the Architectural Association (the twenty-eighth) will take place from the 9th to the 14th August. The district chosen is Lancashire.

Lord Lilford laid on Saturday the foundation-stone of St. Clement's Mission-room, Warrington. The building, which will cost over £2,000, is intended to accommodate 250.

An improvement has lately been completed at the corner of Newgate-street and St. Martin's-le-Grand, where a large slice of the railed-in triangular area in front of the Post Office has been cut off and thrown into the roadway, which is thereby considerably widened.

Plans and sections of the proposed circular light railway from Kittybrewster, to join the Skene and Echt railway at Oldmill, have now been lodged with the authorities. The railway will be a single one, and a little over three miles in length. The estimated cost is £131,690.

At a meeting of builders of Peterborough interested in the formation of a new brick company on Saturday, it was decided, before purchasing the land offered to them for the manufacture of bricks, which is adjacent to Love-lane, Fletton, and in close proximity to the Great Northern Railway, to have reports from Mr. J. C. Gill, C.E., and Mr. Ruddle, architect, with reference to its suitability for brick works.

The Eversfield Estate, St. Leonard's, have presented a piece of land 5a. 1r. in extent, at Silverhill, to be laid out as a recreation ground, in commemoration of the Diamond Jubilee.



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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### JUBILEE STANDS AND STREET STRUCTURES.

**D**ID the framers of the London Building Act ever contemplate the extent to which the clauses relating to "temporary and wooden structures" would be taxed? Could they have foreseen such a contingency as that which is now occupying the daily attention and care of the London County Council and Corporation authorities by the erection along several miles of route of grand stands and seating accommodation for the millions of sightseers who wish to obtain a view, or even a bare glimpse, of the Royal Procession on Jubilee Day? We think not. Not only is every conceivable site and open space utilised for this prodigious spectacle, but the areas and fronts and roofs and even corners of buildings which lie in the route are being covered with timber scaffoldings, temporary balconies, and tiers of seats that have transformed our streets into something like timber-yards, and will in a few days bury so completely many of the edifices in bunting and galleries that the buildings themselves will hardly be seen. So complete a transformation could scarcely have been realised a month or two ago.

The principal section of the new Act, which seems to bear on "wooden structures" of a temporary kind, is section 84, which expressly states that wooden structures (except hoardings inclosing vacant land) are not to be erected without the license of the Council. We may, therefore, assume that all these temporary stands and galleries have been sanctioned and constructed under duly authorised licenses. To our minds, indeed, in some cases they appear to be superfluous in strength, whole balks of timber being used, with a lavish disregard of the strength of structures for a given purpose, though a structure may be overtimbered, and yet weak. Builders and contractors have very judiciously considered that to cut up these timbers to their proper bearing strength would be wasteful and unnecessary for the temporary object in view, seeing that many of the scantlings may be used for other and more permanent works. Most of the structures put up by contract have been estimated at the lowest figure, the main object being to secure a large profit by the letting of seats. A few of these lettings will be devoted to a charitable purpose.

A casual look round at some of the erections prove that, in many instances, the owners or lessees are endeavouring to make the best bargain they can with intending sightseers, and have even gone so far as to block out the light of their own windows by external tiers of seats. Many stories of houses are completely hidden by scaffoldings, as if the occupants had made up their minds to pursue their vocations in lamplight, or to close their premises for the time. A somewhat awkward question may arise in a few cases—viz., Is it competent for the vestry or churchwardens of a church in the centre of the route to obscure the view of house-owners on one side of the obstruction? Or can an owner of a house in a street who has erected a projecting stand in front of his building do so at the expense of his neighbour?

Many of the most conspicuous sites have been acquired by syndicates who offered large sums for positions, cash down, taking all the risks, and who have been asking from 10 to 25 and even 50 guineas for seats, and 500 to

1,000 guineas for rooms; but whether the public will respond to these demands for heavy rents remains to be seen. In many of these stands rooms have been provided for retiring, and cloak-rooms for ladies and sleeping accommodation.

Frontages like those of Mr. Maskelyne and Messrs. Pawsons in St. Paul's Churchyard, have been utilised either by specially-built erections like the former, or the building has been let out in windows at prices varying from five to 30 guineas. Several roofs have been used, like that of Fenning's Wharf adjoining London Bridge, which have many advantages in giving uninterrupted views for a long distance.

Two or three different types of erection may be mentioned. The single gallery or stage, constructed on trestles or trussed frames, stepped for seats, which is the ordinary arrangement seen in the large stands which have been put up along Constitution Hill, St. James's Park, near the Admiralty, on the south side of the Clock Tower of the Houses of Parliament, the Haymarket, Charing Cross Station, and in several parts of Whitehall and in the City. Next we have the gallery in tiers—that is, two or more galleries above one another, as we see at the site on the north side of St. Paul's Cathedral, to be described presently; and, thirdly, we may notice the erections on the fronts of existing buildings in the form of balconies improvised at each story. The roof stands come chiefly under the first of these, and the main thing to insure is that the framing of the roof itself is sufficiently strong and tied to bear the load of a dense and well-packed crowd of people, and that the roof is properly secured by tie-beams.

Along the route from Buckingham Palace to Charing Cross several very large and commodious stands have been erected. The longest and largest is that which extends from the Palace along Constitution-hill to Hyde Park-corner, on the south side, which consists of frames or trusses of rough carpentry about 5ft. or more apart, upon which the seating is carried. The staging varies in depth from six to fifteen rows of seats, to suit the irregularities of the trees which skirt the boundary of the grounds. The trees in many cases are surrounded by the seats. The trusses or supports are roughly braced between uprights about 6in. by 6in. Bolted on the sides of these uprights at the slanting angle of the seats are longitudinal bearers, and upon these are spiked the 9in. by 3in. sloping joists for the seating platforms, each of these being about three planks wide. The route along Piccadilly, St. James's-street, and Pall Mall is unmarked by any important structure; for the most part these are balcony erections, or roof stands. The Commemoration Syndicate has a large building surrounded by three tiers of balconies or stages, and its roof covered on two sides by seats at the corner of Pall Mall and Waterloo-place—a very commanding position. At the corner of the Haymarket, on the site of the Old Theatre Royal, Harrod's Stores, Ltd., have erected a conspicuous stand on this eligible position, with 11 or 12 rows of seats. Trafalgar-square on the north side is covered with staging opposite the National Gallery, and the latter edifice has the recessed wings on each side of its portico filled up with seats. The Church of St. Martin's has been practically ensconced in planks and seats; the west portico has a large sloping gallery, while the south side has been hidden by two tiers of seats or balconies, facing Duncannon-street, in which trussed, open, cross-braced girders of four panels each are used between the balk uprights. There are about five rows of seats in each tier, which abuts against framed supports close to side of church. The braced horizontal girders in front have an ornamental effect, though these will, no doubt, be hidden by bunting. The upright supports are about 15ft. apart, and iron

suspending rods are used in the trussing. At the chancel east end a huge sloping stage has been erected from the raised churchyard level, and extending back the whole width of church. The braces and struts are planks or half-timbers simply bolted to the uprights. In Duncannon-street one large frontage has quite an ornamental structure of balconies, the supports being arched over at top. The Queen Eleanor Cross opposite Charing Cross Railway Station is literally buried in seats. Its elaborate carved and pinnacled outline pierces a huge stand, which will accommodate 1,800 spectators. Passing down the Strand, the Cecil Hotel entrance and other points of vantage are occupied by erections and balcony structures; but the Strand route—the most important thoroughfare—exhibits several sites which have been secured by enterprising syndicates. St. Mary-le-Strand has been seated on its western side with a sloping gallery which entirely blocks out the fine entrance and partially obscures the outline of the edifice, while further eastwards the oval, inclosed churchyard of St. Clement Danes has been utilised in a wonderful manner by W. Whiteley by a continuous series of radiating stands, each having its own stair approach. A large sloping stand or gallery cuts off the west or tower end of the church, and is at least as high as the roof of edifice on the north side, and another sloping stage of seats has been erected on the north-east side, which directly faces down Fleet-street, and will command a rear view of the Royal Procession as it proceeds Citywards. The deep recesses on each side of the Courts of Justice entrance have been filled with sloping seats, and several timber balconies of ordinary construction, some of them more like scaffoldings, are to be met with.

In the construction of a few of these stands and galleries, considerable ingenuity has been shown in making the most of the area and in providing retiring-rooms. Between two party-walls, or in a vacant plot, the task has been easy. It was to erect one large sloping gallery from the pavement line to the back of the area at an angle that would allow each tier of persons to see. A still better plan was to erect three or more tiers of separate galleries, like those in a theatre, at varying angles to suit the vision, which would allow a large number of people to be massed together more in front, and this plan has been adopted on the site of Spence's removed premises in St. Paul's Churchyard, secured by Mr. Maskelyne, of Egyptian Hall fame. Mr. J. N. Maskelyne, with characteristic prescience, seized the opportunity of securing the best position in the whole route, that immediately facing the western portal of St. Paul's Cathedral. Here, where the *Te Deum* will be sung by a choir of 500 picked voices, and within hearing of the special office of the Church to be recited by the Archbishop of Canterbury and the Bishop of London, a pavilion is being erected that is *par excellence* the one piece of skilful construction. James Spence and Co.'s site offered the best opportunity, and Mr. Maskelyne at once made terms to demolish the old premises, and build new premises, in return for the use of the site for three weeks. The plans were at once begun by Mr. J. G. Buckle, A.R.I.B.A., Mr. Maskelyne's architect, and the consulting architect is Mr. Banister Fletcher, Professor of Architecture, King's College. The site has a frontage of 64ft., though not in a straight line; but the bend is favourable to the purpose of vision, by enabling every spectator in any of the four tiers to see the proceedings. To safely support four tiers, each tier containing twelve rows of seats, the structure had to be of considerable solidity and bearing power, and an inspection of the works will amply allay all uneasiness on this score. To give our readers a slight idea of the design being carried out, let him imagine



five huge framed supports erected on a bed of concrete and thoroughly anchored to the ground. These frames are placed slightly radiating along the site to allow for the bend in the frontage. Each frame is 29ft. deep, consists of three main balks or supports, each 12in. by 12in. and 12in. by 9in., connected together by braced and trussed cross girders, these being inclined to the necessary slope for vision. Longitudinally these main supports are connected by other framed open trusses, and upon these are laid the raking timbers which carry the seat platforms. There are twelve rows in each tier, and the whole depth of each of the galleries is about 29ft. measured horizontally, while the whole height of stand is about 60ft. above street level. It will accommodate 2,500 persons, 500 in each tier. We notice that a good allowance of space is given to each person, so that there will be no crowding, as in some other cases on the route, 18in. being allowed for each person in width, and 2ft. 3in. each step back to front. The top tier will be about level with the upper story of the adjoining buildings, and the stand will be protected by a canvas awning. One of the most noteworthy features about this grand pavilion is that the access to each tier from Paternoster-row will be by easy inclines at the rear of the stand, the inclines being only 1 in 7, thus avoiding unnecessary steps. In the basement, retiring, refreshment and smoking rooms, and lavatories will be provided, and on each tier there will be a ladies' room and attendant. The prices of seats in front, range from 25 guineas for the two lower tiers, 20 guineas for the third, and 15 guineas for the upper tier, the back seats being at a lower rate. There are 13,000c.ft. of timber and 18 tons of iron in bolts, straps, plates, &c. The total cost will be about £4,000. The contractor is Mr. J. Greenwood, and the clerk of the works, to whose skill in such structures so much is due—Mr. James Charles—is a pupil of Mr. J. Baillie, the well-known engineer, and late president of the Society of Engineers.

St. Paul's Cathedral is surrounded by seats on the south and east end; those on the side fill in the spaces on each side of transept, and are intended for the City Corporation. The irregularity of the width of the inclosure from the railings in front of Cannon-street to the Cathedral causes an awkward raking of the seats at the building. A deep stand of seats 30 deep faces Cheapside at the east end, and the entrance portico on the west side is flanked by stands on each side of the main steps, and the upper portico is also filled with seats.

Further eastwards, the Royal Exchange has a group of small stands perched on the pediment, from which a bird's-eye view will be obtained of the procession as it wends its way down King William-street, and seats also inclose the space within the railings at St. Mary Woolnoth, the Mansion House portico, the Liverpool and Globe Office, Bank, and other buildings are gaily decorated with lines and festoons of coloured lamps, which will define the architectural features of this great City centre.

On the return route beyond London Bridge, in High Street, and Borough Road, the erections and balconies are of less interest, the great erection of stands round the restored church of St. Saviour being the exception. Here a large stand to hold 3,000 spectators is being erected which will go back to the gabled front of Lady Chapel, raised from the level of churchyard. A very commanding roof of moderate height has been utilised—that of Fenning's Wharf on the Surrey side of London Bridge, commanding a considerable view of the procession; entrance in Tooley-street. No other remarkable structures call for notice till we arrive at Westminster Bridge, where near St. Thomas's Hospital a large corner stand, holding some hundreds of seats, and also stages fitted on the recesses

of hospital entrance, may be seen. A still larger staging has been put up in the piece of ground east of the Clock Tower of the Houses of Parliament. This is a deep, sloping gallery of 25 rows of seats, supported on framed trusses brought up from the level of the lower quay or terrace-level by upright timbers, 9in. by 9in., braced together. St. Stephen's Club opposite is rigged up with stages for seats, and some curious corners are also filled up with seats. A series of small stands like jury boxes have been erected along the inside of the courtyard of the Houses of Parliament in Bridge-street and at the corner of Parliament-square. Whitehall is occupied by one or two important stands, one facing the Horse Guards, the "Royal Horse Guards Pavilion"; while the entrance on the St. James's Park side of the Horse Guards, and the ground in front of the new Admiralty buildings, have large sloping stands which will command a view of the procession on its return up the Mall.

The details of these erections differ more in workmanship than in design. Squared timbers, balks, "scantlings," whole and half timbers have been employed, though not all of the desired quality. The methods of connecting the uprights and horizontal timbers are either by bolting the latter to the sides of uprights, or halving them. A few of the stands have the upright timbers built up in three thickness and bolted together. These uprights, in all cases, rest on sleepers. The stepped seats or platforms generally rest on raking bearers from 18in. or more apart, and these in turn are simply bolted or secured to longitudinal timbers or purlins which rest on trussed-shaped supports, braced and tied together. In some cases we find the distance of the longitudinal timbers considerable for the raking bearers, which in every case ought to be notched and bolted to them, as these latter take the direct weight of the seats. Have these raking timbers been all strutted to the uprights?

From all sides we hear the question, Will the seats be safe on many of these improvised and very roughly framed erections? By the unfortunate division of authority which excludes the City from the salutary regulations of the Building Act we have mentioned, the wooden structures within the City of London are exempt from the provisions of the 84th section, and there is no one, it appears, responsible for the safety of the stagings and stands erected inside buildings. At the meeting of the City of London Tradesmen's Club the point of safety has been discussed on the initiative of Mr. R. Butson, and it was suggested that the City Commissioners should make such regulations as were necessary for the safety of these wooden structures. At present, all builders of stands, therefore, within the City are responsible for the safety of their own structures. But of those erected outside the City—are they safe? From a hasty inspection of some that have been erected at Charing Cross and the Strand, we should not like to say whether they would bear any simultaneous rising or ovation of the crowd. Some of them are of very rough construction, the joints of the squared timbers are merely "dogged" together very close to the ends, and in some cases the bracing is inadequate. A great weight of people (a live distributed load, it must be remembered) on a sloped staging carried at some height above the street level on uprights, would naturally exert an oblique force on the framed supports, requiring raking shores or struts, and in some cases ties, to prevent a lurching over. A system of simple upright supports and horizontal scantlings secured by "dogs" can afford little resistance against such a movement, as they would simply turn, as on pivots. Back-stays and bracing are, therefore, absolutely necessary. Are, too, the stairways and exits sufficient in all cases?

From an architectural point of view, very

little has been attempted. The most unsightly sections are those which have been put up in defiance of the lines of buildings on sites of irregular width, like that opposite Charing Cross Station; the churches of St. Martin, St. Mary, St. Clement Danes, and St. Dunstan's in the West have been obscured, or so hidden that they seem to rise out of a mass of timber stacks and sloping stages, which will be slightly ameliorated by the schemes of bunting and decoration. In the City the decorations will be very elaborate, and are intrusted to a committee representing the occupiers. No streamers are to be allowed across the streets to impede the view, and the decoration will be confined to Venetian masts or specially-designed columns along both sides, carrying festoons of flowers. At the Mansion House, London Bridge, and the Monument, the Corporation has voted £1,600 for the decorations.

We may mention here that the average cost of the temporary stands erected by the Office of Works is about 7s. 6d. per head, though this would hardly pay for some of those erected at considerable heights above the ground level.

#### THE DUDLEY GALLERY ART SOCIETY.

THE comparative smallness of this gallery is rather a blessing in disguise, as it prevents the overcrowding of its walls with works of a commonplace kind. The few good water-colour pictures, and the sketches now on view at the Egyptian Hall, are by well-known and experienced hands. H. Sylvester Stannard, R.B.A., is a contributor of some sympathetically-drawn landscapes, in which charm of colour and manipulative skill are combined. "Our Village" (5) is an evening effect—a few cottages by the side of a narrow road seen against a calm evening sky. "Twitch Fire" (52) and "The Sun's Hour of Rest" (62) breathe the same calmness and sentiment of sunset. The embers burning on the common, the red sunset or afterglow effect, and the very pleasing sunset landscape of the latter are in the same note. L. Burleigh Bruhl, R.B.A., is smooth and delicate in his "Sober Summer" (13), the softened foliage and the river give atmosphere; "Langley Mill, Essex" (44) and a view on the Wye (321) are noticeable sketches. Sunny and picturesque is E. W. Hereford's work, "Isola, Piscatori, Baveno," and C. Topham Davidson has a fresh beach scene, "Coming in with the Tide," shallow waves spreading over a sandy beach, reflecting an evening sky, and other studies of boats and harbours. Geoffrey Birkbeck, "Study of a Macaw" (26), is clever and vigorous in the handling of the plumage of the bird and as a study of colour. The surf and rocks in "The Needle's Eye, Berwick-on-Tweed," by J. S. Hutton, are skillfully delineated. Nigel B. Severn, the president's son, has three or four pieces. His "Fisherfolk, Mentone" (35) is sunny and almost Titianesque in colour, the "Old Houses, Dinan," sketch of picturesque gables, are familiar objects. Walter Severn, the president, sends four subjects, chiefly views of Biarritz and its neighbourhood. "Patient Models at a Basque Farm" (180), oxen yoked to cart, is an interesting study. "Cloud and Sunshine" (225), a clever piece of reflection on the rippled sea at this favourite French seaside resort, and the "Blue Pool, Coast of Cork," a smooth blue sea between rocks, are more in the president's line. Berenger Benger's landscape work is rather weak. His "Springtime," Hampstead, is sunny and the spring foliage brilliant, but there is a lack of vigour about his other pictures, "A Resting Place" (126), and "A November Day" (136), which are rather flat. Evangeline Jex-Blake is always broad and effective in her sketches. "Evening Sketch, near Hythe" (164), a sunlit meadow bounded



by a dark line of trees, is exceedingly broad, and the simple blending of washes effective. "The Bishop's Eye, Wells" (270), the old gateway, is also a crisp sketch. Margaret Bernard (173) has a broad sketch in washes of grey and green, of "Wells Cathedral," in which the structure is seen in dark profile, and her riverside sketch at Norwich (182), both instances of rapid sketching with the brush. Neat in drawing is F. W. Cartwright's view of "Melrose Abbey," showing the ruin at the crossing and broken tower; and Miss Mabel Alice Butler has a pleasing study in colour of the red-tiled roofs at Florence (65). A large seascape by J. S. Hutton of Conway Bay (63)—a shallow, eddying sea breaking over rocks—may be noticed. Other works by lady artists claim notice. A nice sketch of pine trees (47) is by Dora C. Martin. Miss Bertha Scarth is able to grasp natural effects; her "Sunset at Bosham," her steps at "Clovell" (33)—a delightful bit of sunlight and foliage, and her sketch of boys at a grinding machine (69) are amongst the best studies. Another lady artist, Miss Rose Douglas, sends a bold sketch of canal and houses, "Dordrecht," a cottage gate (105), "Walberswick"—an evening study (179), all broad and excellent in colour. Herbert Medlycott is a prolific contributor. His views of "London Bridge" (53) suffer rather from a feebleness of drawing than of colour. Picturesque grouping and tone are the strongest qualities in his views of "Amiens Cathedral, St. Germain, Amiens—Doorway of St. Pierre, Louvain" (176).

Of subject studies we may notice Geoffrey Birkbeck's portrait sketch (60), a girl in blue frock, with bright hair, playing a violin, her back to spectator. The figure is well drawn; Mrs. Mariquita Moberley's "Fair as a Lily," a study of a lady's head, nice in colour and expression; Mrs. Sydney Bristowe's portrait of her mother (280), a clever sketch. Seascapes and coast studies are favourite subjects. "A King among His Fellows," by Norman Crosse (86), is a fine study of a wave dashing against rocks; "Packing Herrings, Yarmouth," by Frances E. Nesbitt, is worthy of that lady's talent (115); S. Key's "South Cliff, Scarborough," is a masterly study of sea and cliff and coast line. Minute finish, but want of breadth in foliage, characterises R. A. K. Marshall's view of Stockbridge on the Test (129). "Clearing Up," by R. Wane (246), is a good study of rough sea and rock; but the finest seascape in the room is David Green's "A Nor'-Wester at Katwyk, Holland." In colour and freshness and the drawing of fishing boat Mr. Green has done little better. We must also just mention the pleasing work of Chas. J. Adams (254), C. Duassut's evening landscape effects (258), and (267) Lexden L. Pocock's "Tiber in Flood," a red sunset view, an attractive study of colour and reflection, with its silhouetted features; David Green's clever "Dutch Auction" (306), full of freshness and air in the group of fisher-folk on beach; works by Fred Burgess (341), Percy Dixon, Miss Agnes Duffield (350, 351), W. Percy French (374), admirable in gradation and tone; and George Marks's gorse studies (272), amongst a few others that are worth notice.

#### STABLE CONSTRUCTION AND SANITATION.—XVIII.\*

##### LEGISLATIVE MEASURES.

HAVING considered in detail the best methods of constructing different descriptions of stable buildings so as to secure thorough sanitary efficiency, and by this means insure a maximum degree of health and comfort for the occupants, it seems desirable to make a brief reference to the ordinances which, from time to time, have been enacted by Parliament concerning buildings of this character, and the powers which have thereby

become vested in the local authorities throughout the country.

The various legislative measures have primarily for their object the prevention of disease amongst those animals which are in any way used for human food. Of this class cattle form by far the most important section, for their flesh not only provides the largest proportion of the total quantity of animal food consumed by man, but cow's milk is also in itself a staple article of everyday diet; as a consequence, the regulations bearing upon stable constructions are confined almost entirely to the sanitary conditions of cowhouses, dairies, and their accessories.

The Contagious Diseases (Animals) Act of 1878, 41 and 42 Vic. c. 74, as amended by the Contagious Diseases (Animals) Act of 1886, 49 and 50 Vic. c. 32, sets forth the measures which must be taken under certain circumstances for the prevention and stamping out of infectious diseases amongst animals. For the purposes of this Act it is laid down that wherever the word "animals" is used therein it includes cattle, sheep, goats, and swine, whilst the word cattle is still further defined as embracing bulls, oxen, cows, heifers, and calves.

Under this Act full powers are also vested in the Local Government Board to make such general or special orders as they think fit for the following purposes, viz.:—

I. The registration with the local authority of all cowkeepers and dairymen.

II. The inspection of cattle in dairies, and for prescribing and regulating the sanitary construction of all cowsheds occupied by cowkeepers or dairymen.

III. For securing the cleanliness of milk-stores and shops, and the milk vessels used therein.

IV. For prescribing precautions to be taken for protecting milk against infection or contamination.

V. For authorising a local authority to make regulations for the purposes aforesaid, subject to the conditions prescribed by the Local Government Board.

The regulations which govern the registration of dairymen, together with the water supply and sanitary condition of dairies and cowhouses, are fully set forth in the "Dairies, Cowsheds, and Milk Shops Order of 1886, as amended by the Dairies, Cowsheds, and Milk Shops amending Order of 1886." This order extends to England, Wales, and Scotland only, and the most important of its provisions are summarised as follows:—

Section 6 refers to the registration of cowkeepers and dairymen by the local authority.

Section 7 provides that all cowkeepers or dairymen intending to occupy a building as a cowshed or dairy which has not been previously so occupied must first give one month's notice to the local authority: also that the lighting, ventilation, air-space, cleansing, drainage, and water supply of such buildings must be carried out to the reasonable satisfaction of the local authority.

Section 8 states that "it shall not be lawful for any person following the trade of cowkeeper or dairyman to occupy as a dairy or cowshed any building, whether so occupied at the commencement of this order or not, if, and as long as, the lighting and ventilation, including air-space, and the cleansing, drainage, and water supply thereof are not such as are necessary or proper—(a) for the health and good condition of the cattle therein, and (b) for the cleanliness of milk vessels used therein for containing milk for sale, and (c) for the protection of the milk therein against infection or contamination."

Section 9 enacts that it is unlawful for any person suffering from a dangerous infectious disorder, or who has recently been in contact with a person so suffering, to milk cows, handle vessels, or in any way take part in the production, distribution, or storage of milk until all danger of infection or contamination has ceased.

Section 10 provides that no water-closet, earth-closet, privy, cesspool, or urinal shall be within, or communicate directly with, or ventilate into, any dairy or room used as a milk store or milk shop.

Section 11 prescribes that no milk store or milk shop shall be used as a sleeping apartment, or for any purpose which is likely to cause contamination of the milk.

Section 12 declares it to be unlawful for a cowkeeper, dairyman, or purveyor of milk to keep swine in a cowshed, milk store, or any place used for keeping milk for sale.

Section 13 empowers the local authority to make regulations for—(a) the inspection of cattle in dairies, (b) prescribing and regulating the sanitary arrangements of dairies and cowsheds occupied by cowkeepers or dairymen, (c) securing the cleanliness of milk shops and all vessels used therein, (d) prescribing precautions against the infection or contamination of milk.

Section 14 provides that all such regulations shall be first submitted to the Local Government Board for approval, and afterwards advertised in the local newspapers.

Section 15 states that "if at any time disease exists among the cattle in a dairy or cowshed, or other building or place, the milk of a diseased cow therein—(a) shall not be mixed with other milk, and (b) shall not be sold or used for human food, and (c) shall not be sold or used for food of swine or other animals unless and until it has been boiled.

As already mentioned, the regulations made by the various local authorities are based upon the "Dairies, Cowsheds, and Milk Shops Order, 1885-6," of which the foregoing is a brief outline. The by-laws enforced by the London County Council respecting the sanitary conditions of all dairies, cowsheds, and milk shops embraced within their jurisdiction are now given for purposes of reference.

#### REGULATIONS AS TO DAIRIES, COWSHEDS, MILK SHOPS, &c., AND AS TO PRECAUTIONS AGAINST THE INFECTION AND CONTAMINATION OF MILK IN THE METROPOLIS.

(The powers and duties of the Metropolitan Board of Works have been transferred by the Local Government Act, 1888, to the London County Council, and any person failing to observe these Regulations will be proceeded against by that Council accordingly.)

In pursuance of Section 13 of the Dairies, Cowsheds, and Milk Shops Order of 1885, the Metropolitan Board of Works being the local authority for the Metropolis (except the City of London and the liberties thereof) hereby make the following regulations:—

(a) For the inspection of cattle in dairies.

(b) For prescribing and regulating the lighting and ventilation, cleansing, drainage, and water supply of dairies and cowsheds in the occupation of persons following the trade of cowkeepers or dairymen.

(c) For securing the cleanliness of milk stores, milk shops, and of milk vessels used for containing milk for sale by such persons.

(d) For prescribing precautions to be taken by purveyors of milk, and persons selling milk by retail against infection or contamination.

##### REGULATIONS.

1. These regulations shall commence and take effect from and immediately after the third day of August, 1885.

2. Every inspector appointed by the board under this Act is hereby authorised to inspect all cattle upon the premises of all persons registered by the board under the Act.

3. Every cowshed shall be well and sufficiently lighted by openings in the sides or roof, or by windows therein.

4. Every cowshed shall be thoroughly ventilated by lantern-louvered ventilators in the roof thereof, or by louvered ventilators in the walls, or by openings in the sides or roofs.

5. In every cowshed there shall be sufficient air-space for the health and good condition of the cattle therein, i.e., there shall be for each animal kept in a separate stall a superficial space of at least 8ft. by 4ft., and for two animals kept in one stall a superficial space of 8ft. by 7ft., and there shall be an air-space of at least 600c.ft. in respect of every animal kept in a cowshed, where, taking into consideration the position and construction of the shed, there are perfectly satisfactory means of ventilation; but, in other cases, there shall be an air-space of 800c.ft. in respect of every animal kept, and, in any case, the height of the shed in excess of 16ft. shall not be taken into account in estimating the air-space.

6. Every cowshed shall be well-paved with Stourbridge or other impervious brick or other impervious material, set with cement properly bedded on concrete, with a proper slope towards a gully-hole, which shall, where practicable, be outside the shed; and such gully-hole shall communicate by an adequate drain of glazed stoneware pipes with the public sewer, and be trapped by an appropriate fixed trap, and be covered with a grating, the bars of which shall not be more than



2 in. apart, excepting that not exceeding 3 ft. of the foremost part of the stalls may be paved with chalk or other similar material.

7. Every cowshed shall be provided with an adequate supply of water, and where there is not a constant water supply, with a slate, metal, or metallic-lined tank, properly covered and provided with an overflow or warning pipe, and with piping for conveying the water to the cowshed, such tank to be so placed that the bottom thereof shall be not less than 6 ft. above the floor level. Every such tank shall be of a capacity equal to 12 gallons of water for each cow lawfully kept, it shall have no communication with any water-closet or drain by means of a waste-pipe, and it shall be supplied with good and wholesome water, which, if practicable, shall be procured by the occupier from a public water company, and such tank shall be cleansed as often as is necessary for keeping the same in a clean condition.

8. Each stall or standing place for cows in every cowshed shall be provided with a water-trough or receptacle, constructed of, or lined with, hard, smooth, and impervious material, and each such trough or receptacle shall be supplied with water by means of a pipe communicating with a water-tank, or, in the case of a constant water supply, with the water company's pipes, and each such trough or receptacle shall also be provided with a waste-pipe or waste-hole in the lowest part thereof.

9. The inner walls, doors, and woodwork (except the partitions between the cows) of every cowshed shall be covered with hard, smooth, and impervious material to a height of at least 5 ft. from the floor of such cowshed, and such hard, smooth, and impervious material shall not be covered with cement-wash, lime-wash, or other substance.

10. Every cowshed shall be provided with properly-constructed places or receptacles for storing any brewers' grains intended for the animals therein, and also places or receptacles for receiving the dung and litter from the cowsheds, and such places or receptacles shall be constructed of, or lined with, impervious material, and be properly drained, but no such places or receptacles shall be within, or communicate directly with, any cowshed.

11. No water-closet, privy, cesspool, or urinal shall be within, communicate directly with, or ventilate into, a cowshed.

12. No dung, grains, or other substance from which effluvia is liable to be given off, shall be kept in any cowshed; nor shall any dung, grains, or other substance, as aforesaid, be so kept that any effluvia therefrom can enter any shed.

13. The upper parts of the inner surface of the walls of every cowshed shall be thoroughly cleansed and limewashed in the months of March and September, and at other times within seven days of the board giving notice in writing that such cleansing and limewashing are necessary.

14. The floor of every cowshed and all troughs or utensils used for supplying the cows with food and water shall be thoroughly cleansed with water at least once every day, and the portions of the walls, partitions, doors, and other parts of the cowshed within 5 ft. of the floor shall be thoroughly cleansed as often as may be necessary for keeping the same in a clean condition.

15. All dung and offensive litter shall be carefully swept up and removed from every cowshed at least twice every day, and shall be removed from the premises as frequently as may be necessary to prevent nuisance.

16. All utensils and vessels used by a cow-keeper for the reception, storage, or delivery of milk shall be thoroughly cleansed with steam or scalding water as frequently as may be necessary for keeping such vessels and utensils perfectly clean and sweet, and only clean water shall be used for this purpose.

17. Every cowkeeper shall at all times employ such means and adopt such precautions as may be necessary for keeping any cowshed in his occupation and the cows therein in a clean and wholesome condition.

18. Every dairy shall be sufficiently lighted, and shall be thoroughly ventilated by louvred ventilators, ventilating shafts, or openings in the walls or roof.

19. Every dairy shall be well paved with flag-stones, concrete, or other suitable material properly set in cement, and the inner walls thereof shall be covered with hard, smooth, and impervious material to a height of at least 6 ft. from the floor of such dairy, and such hard, smooth, and

impervious material shall not be covered with cement-wash, lime-wash, or other substance.

20. The floor of every dairy shall fall or slope towards an opening in the walls thereof leading to a properly-trapped gully-hole outside such dairy, and no inlet to a drain shall be within any dairy.

21. Every dairy shall be provided with an adequate supply of water, and, where there is not a constant supply, with a slate, metal, or metallic-lined tank, properly covered, and provided with an overflow or warning pipe, and with piping for conveying the water to the dairy. The tank shall have no communication with any water-closet or drain by means of a waste-pipe, and shall be supplied with good and wholesome water, which, if practicable, shall be procured by the occupier from a public water company, and such tank shall be cleansed as often as may be necessary for keeping the same in a clean condition.

22. The floor of every dairy and the portions of the walls and other parts of the dairy within 6 ft. of the floor thereof, as well as all fixtures and tables therein, shall be cleansed with water as frequently as may be necessary for keeping such dairy, fixtures, and tables in a thoroughly clean and wholesome condition, and the ceilings and the upper parts of the inner surface of the walls shall be thoroughly cleansed and limewashed as frequently as may be necessary for keeping the same in a clean condition.

23. All utensils and vessels used by a dairyman for the reception, storage, or delivery of milk shall be thoroughly cleansed with steam or scalding water as frequently as may be necessary for keeping such utensils and vessels perfectly clean and sweet, and only clean water shall be used for the purpose.

24. Every dairyman shall at all times employ such means and adopt such precautions as may be necessary for keeping any dairy in his occupation and the utensils and vessels used by him for containing milk in a clean and wholesome condition so as to preserve the purity of such milk.

25. Every milk store or milk shop, as well as all fixtures and tables therein used in connection with the keeping or sale of milk, shall at all times be kept in a cleanly condition.

26. All utensils and vessels used for the reception, storage, or delivery of milk shall be thoroughly cleansed with steam or scalding water as frequently as may be necessary for keeping such utensils and vessels perfectly clean and sweet, and only clean water shall be used for the purpose.

27. Every person following the trade of cow-keeper or dairyman shall at all times employ such means and adopt such precautions as may be necessary for keeping the utensils and vessels used by him for containing milk in a clean and wholesome condition so as to preserve the purity of such milk.

28. Every purveyor of milk, or person selling milk by retail, shall immediately on any outbreak of infectious or contagious disease within the building or upon the premises in which he keeps milk, or amongst the persons employed in his business, give notice of such outbreak to the board at their office in Spring-gardens.

29. Every purveyor of milk, or person selling milk by retail, shall immediately on such outbreak coming to his knowledge remove all milk for sale and all utensils for containing milk for sale from such building, and shall cease to keep milk for sale or to sell milk in such building until the same has been disinfected and declared by the medical officer of health for the district to be free from infection.

30. Every purveyor of milk, or person selling milk by retail, shall not keep milk for sale in any place where it would be liable to become infected or contaminated by gases or effluvia arising from any sewers, drains, gullies, cesspools, or closets, or by any offensive effluvia from putrid or offensive substances, or by impure air, or by any offensive or deleterious gases or substances.

31. Every purveyor of milk, or person selling milk by retail, shall only keep milk for sale in clean receptacles, and all utensils used in connection with the keeping or sale of such milk shall be at all times kept clean.

32. Every purveyor of milk, or person selling milk by retail, shall at all times employ such means and adopt such precautions as may be necessary for preserving the purity of milk and for protecting it against infection or contamination.

33. The regulations made by the board in pur-

suance of the Dairies, Cowsheds, and Milk Shops Order of July, 1879, are hereby revoked.

NOTE.—Any person guilty of an offence against the foregoing order or regulations is liable to a penalty of £5, and, in the case of a continuing offence, to a further penalty of 40s. for each day after written notice of the offence from the board.

In addition to the foregoing regulations directly relating to cowsheds, dairies, &c., there are also certain others which must be complied with whenever it is found necessary to construct dung-pits or cesspools in connection with stable or other buildings within the same area. These latter regulations form a portion of the by-laws made by the London County Council under the Public Health (London) Act of 1891, and which are intended to deal with the sanitary condition and equipment of buildings generally.

The by-laws which specifically refer to the construction and cleansing of cesspools, dung-pits, &c., are as follow, viz.:—

“20. Every person who shall construct a cesspool in connection with a building shall construct such cesspool at a distance of 100 ft. at the least from a dwelling-house or public building, or any building in which any person may be, or may be intended to be, employed in any manufacture, trade, or business.

21. A person who shall construct a cesspool in connection with a building shall not construct such cesspool within the distance of 100 ft. from any well, spring, or stream of water.

22. Every person who shall construct a cesspool in connection with a building shall construct such cesspool in such a manner and in such a position as to afford ready means of access to such cesspool for the purpose of cleansing such cesspool, and of removing the contents thereof, and in such a manner and in such a position as to admit of the contents of such cesspool being removed therefrom and from the premises to which such cesspool may belong without being carried through any dwelling-house, or public building, or any building in which any person may be, or may be intended to be, employed in any manufacture, trade, or business.

He shall not in any case construct such cesspool so that it shall have, by drain or otherwise, any means of communication with any sewer or any overflow outlet.

23. Every person who shall construct a cesspool in connection with a building shall construct such cesspool of good brickwork bedded and grouted in cement, properly rendered inside with cement, and with a backing of at least 9 in. of well-puddled clay around and beneath such brickwork, and so that such cesspool shall be perfectly watertight.

He shall also cause such cesspool to be arched or otherwise properly covered over, and to be provided with adequate means of ventilation.

24. A person shall not use as a receptacle for dung any receptacle so constructed or placed that one of its sides shall be formed by the wall of any room used for human habitation, or under a dwelling-house, factory, workshop, or workplace, and he shall not use any receptacle in such a situation that it would be likely to cause a nuisance or become injurious or dangerous to health.

25. Every owner of any existing receptacle for dung shall, before the expiration of six months from the date of the confirmation of these by-laws, and every person who shall construct a receptacle for dung, shall cause such receptacle to be so constructed that its capacity shall not be greater than 2 c. yds., and so that the bottom or floor thereof shall not in any case be lower than the surface of the ground adjoining such receptacle.

He shall so construct such receptacle that a sufficient part of one of its sides shall be readily removable for the purpose of facilitating cleansing.

He shall also cause such receptacle to be constructed in such a manner and of such materials and to be maintained at all times in such a condition as to prevent any escape of the contents thereof, or any soakage therefrom into the ground or into the wall of any building.

He shall cause such receptacle to be so constructed that no rain or water can enter therein, and so that it shall be freely ventilated into the external air.

Provided that a person who shall construct a receptacle for dung the whole of the contents of which are removed not less frequently than every forty-eight hours shall not be required to construct



such receptacle so that its capacity shall not be greater than two cubic yards.

And provided that a person who shall construct a receptacle for dung, which shall contain only dung of horses, asses, or mules with stable litter, and the whole of the contents of which are removed not less frequently than every forty-eight hours, may, instead of all other requirements of this by-law, construct a metal cage, and shall beneath such metal cage adequately pave the ground at a level not lower than the surrounding ground, and in such a manner and to such an extent as will prevent any soakage into the ground; and, if such cage be placed near to or against any building, he shall adequately cement the wall of such building in such a manner and to such an extent as will prevent any soakage from the dung within or upon such receptacle into the wall of such building.

26. The occupier of any premises shall once at least in every week cause every earth-closet, privy, and receptacle for dung belonging to such premises to be emptied and thoroughly cleansed.

The occupier of any premises shall once at least in every three months cause every cesspool belonging to such premises to be emptied and thoroughly cleansed.

27. The owner of any premises shall maintain in proper condition of repair every water-closet, earth-closet, privy, asphalt, cesspool, and receptacle for dung, and the proper accessories thereof belonging to such premises.

28. Every person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a penalty of £5, and, in the case of a continuing offence, to a further penalty of 40s. for each day after written notice of the offence from the sanitary authority; provided, nevertheless, that the Court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if the Court think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this by-law."

The by-laws, which have been framed by the different local authorities for regulating the sanitary condition of stable and other buildings situated in their respective districts vary somewhat in detail, according to local circumstances, but they are essentially the same as those just quoted. From the most cursory perusal of these regulations it at once becomes apparent how necessary it is that the hygienic construction of stable buildings—especially cowhouses and their appurtenances—should receive the most careful attention. Neglect of such precautions must necessarily exert a far-reaching effect upon the public health, and for this reason, if for no other, it is important that an adequate standard of sanitary efficiency should in all cases be maintained.

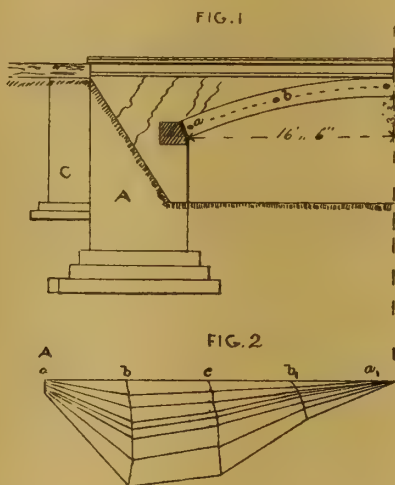
#### CONSTRUCTION OF ARCHES IN CONCRETE.—VI.

WHILE the experiments we have recorded, and the results which have been obtained in connection with arches of small—we may say very small—spans are sufficient for themselves, they would not warrant alone the construction of other examples upon a scale of greater magnitude. In order, with reference to the larger and altogether more pretentious designs, to make sure of one's ground, it becomes, if not absolutely necessary, at any rate, strongly advisable, to extend the series of testing operations to arches which will approximately approach nearer to the actual dimensions of the intended structures than the somewhat insignificant specimens previously subjected to trial. It was determined, therefore, to build a couple of arches fulfilling exactly the same conditions with respect to span, rise, and other general proportions and dimensions, and to make trial of their respective resistances and behaviour during the experiment. One of the arches was constructed of plain cement concrete, or on the simple system, and the other was built of Monier cement. It is somewhat doubtful whether this second example should be classed as belonging to the simple or compound system, inasmuch as although it was not fortified by the introduction or incorporation within its mass of any miscellaneous metallic wire, netting, rolled joists, or any sections of iron or steel, a layer of lattice-work consisting of timber lathing was imbedded in the intrados in the neighbourhood of each springing, and spreading upwards in the direction of the haunching. The laths composing the layer of lattice-work were  $\frac{3}{4}$  in. by  $\frac{1}{2}$  in., and the diamonds or openings were  $2\frac{1}{2}$  in.

across—or, in other words, that was the size of the meshes. There can be not the slightest question that the arch derived no adventitious assistance from so temporary and fragile an accessory. It may, therefore, be wholly disregarded; the comparison of the respective strengths of the two arches reduced to that of a competitive trial of the separate resistances of ordinary cement versus Monier cement concrete, and both structures are thus relegated to the same category of the simple system. The general dimensions of both arches were the following: Span = 33ft., rise = 3.3ft., which thus gives the usual and admittedly correct relation expressed by the equation—

$$V = \frac{S}{10}$$

At the crown of the arch the thickness or depth was 6in., increasing to 8in. at the springings, and the width 13 $\frac{1}{2}$ ft. It will be at once evident that when the span of an arch constructed of concrete reaches the respectable length of 33ft., it becomes quite impossible to conduct experiments upon it, proceeding to a point so extreme as its failure or fracture, upon the same lines as those which characterised similar tests of similar examples of a much smaller stretch between bearings. Rolled steel joists, which were shown in our previous article to have failed, until subsequently strengthened by transverse stiffening pieces at the ends over the abutments, and by the addition of extra tie-rods, even when the arches were of the minimum span, would be no



longer adequate to resist the thrust of larger arches brought upon them by the testing load. They were consequently discarded, and it became imperative to build the pair of structures now under consideration in precisely the same manner, and with the same care and attention, and at the same cost belonging to actual bridges designed to carry a single track of heavy railway traffic. Solid abutments with their accompanying counterforts, buttresses, and wing-walls, were provided, even to the finishing coping and string-course. Commencing with the arch in ordinary cement concrete represented in half-elevation in Fig. 1, which is quite sufficient for all practical purposes, it was constructed of strong abutments, A, flanked by equally substantial counterforts, C, both of which were built of concrete consisting of one part of Portland cement, three parts of sharp, clean, hard river sand passed through a sieve, and three parts of carefully selected gravel. The concrete was placed *in situ* in layers of from 4in. to 5in. thick, thoroughly well rammed and consolidated. The abutments having been satisfactorily completed, the arch itself was then taken in hand, and was built with a description of concrete a little different from that employed in the other parts of the structure. Instead of three parts of sand, only two were used, and broken stone in the proportion of one part replaced the three parts of gravel. This difference should be noticed, as we shall refer to it again, as well as the detail that the thickness of the layers was increased to 6in. Beginning at each springing, the ramming process was carried on symmetrically and *pari passu* towards the crown. A layer of neat cement was laid over the haunching to keep the arch and its abutments free from moisture. In this instance the arch was not allowed to butt solidly on the naked impost, but several sheets of asphalte,

shown by the thick black line in Fig. 1, amounting in the aggregate to a total thickness of  $\frac{1}{2}$  in. and  $\frac{1}{4}$  in., were interposed between them, the object evidently being to form a kind of buffer or cushion to take up or absorb any sudden thrust or shock which might be brought upon the arch during the experimental testing. One great advantage attending the erection of arches of concrete is the rapidity with which they can be constructed, compared with their *confrères* of brick and stone. As a proof, the whole of the arch under notice was finished by 20 workmen in ten hours, with a consumption of 44 barrels of cement weighing some ten tons. When the centres were struck about a month afterwards, not the slightest evidence of sagging was perceptible.

It was not until three months after the striking of the centres that the actual tests were commenced. This was a sometime longer interval than was accorded to the arch of Monier cement; but the apparatus and appliances, to which we shall draw attention, for registering the displacements, deformations, and stresses were precisely the same in both experiments. As a portable, convenient, and readily manipulated medium of loading, ordinary rails were employed, piled up in successive tiers or stages upon that half of the arch represented in Fig. 1. Each tier weighed 12 $\frac{1}{2}$  tons, which was at the rate of 135lb. per square foot of the vertical projection of the arch curve. When the surcharge amounted to 0.232 of a ton, cracks and fissures made their appearance on the sides and faces of the abutments. The first crack in the arch showed itself at about 18in. from the crown on the loaded half of the arch, when the weight had been raised to 0.454 of a ton per square foot. After the deflections had been measured, one-half of the load was removed, and the deformations due at that juncture accurately ascertained. Subsequently the loading was continued until it amounted to 0.938 per same unit of area, and was allowed to remain on for three days, and then the final registrations were recorded. Deformations occurred in the spandrel walls, as shown by the wavy lines in Fig. 1, and along the axis of the arch at the points where the small black circles appear. At the crown of the arch the maximum deflection was 1.2lin. for the semi-arch when loaded, and 0.95 for the unloaded half at the same point. In the middle of the unloaded half the deflection was exactly  $\frac{1}{2}$  in. A diagram is given in Fig. 2, representing the deformations undergone by the arch when tested by gradually successive loads, and may require some little explanation. It must be read in conjunction with Fig. 1, and in it the horizontal line A B is the development of the axis of arch ring, one-half of which is shown by the dotted line a b c in Fig. 1. The points at which the deflections and deformation were registered are at a, b, and c, and for the whole arch also at a and b on the other half-arch, not shown in Fig. 1. In the diagram, the vertical distances between the longitudinal lines indicate the gradual increments of deflection, due to the successive addition of each tier of rails, each of which was equal to a weight of 12 $\frac{1}{2}$  tons. It is evident that after the total load reached a certain magnitude, the increments in the value of the deflections augmented in a far higher ratio than the corresponding increase in the respective loads themselves, a fact that previous experiments fully confirm.

From what was stated in our last article, it might be assumed that the depth or thickness at the crown of an arch built of concrete may with safety be reduced below the ordinary proportion adopted for similar structures of stone and brickwork. This conclusion must not be arrived at too hastily, for several reasons. It should be borne in mind that of whatever materials an arch may consist, whatever particular form or profile it may have, and in whatever manner it may be loaded, it can be theoretically treated as the ideal type—that is, the linear arch. It is true that linear arches have practically no existence; but regarding them in the light of chains, cords, wires, or, in fact, as the lineal axis of an arch ring, all the formulae, equations, and calculations which will maintain it in equilibrium are available for determining the directions and amounts of the different resistances of real arches, whether in the form of ribs, or in that of continuous vaulting. An arch is merely a suspension chain inverted, and under similar conditions of loading and of dimensions, the only difference is that the pull in the one is converted into a thrust in the other. In both cases the direction of the pull or the thrust is tangential to



the line of resistance—that is, the curve joining the points where the centres of pressure are located. So far as the linear arch is under investigation, the stresses and forces, whether direct or transmitted, which will establish equilibrium, can be ascertained with a fair amount of accuracy, although the necessary theoretical formulæ and equations, and their practical application, are complicated, tedious, and difficult. When, however, we endeavour to apply the results derived from the study of the ideal arch to the actual designs of intended structures, they are only susceptible of a rough and frequently unreliable approximation. For these, as well as for other reasons, it is not advisable, nor, in truth, neither good engineering nor architectural practice, to cut down the depth or thickness of the arch ring at the crown, or even elsewhere, to the minimum that sheer theoretical calculation might permit.

All arches may be divided generally into two classes, including (1) those which are semi-circular and spring vertically from the points of supports or abutments; and (2) those which do not. If we put  $\theta$  to represent the angle made by the tangent to the curve in these two instances, we shall for the value of their separate equations—

$$(1) \theta = \text{zero} = 0^\circ \dots\dots\dots (1)$$

and for the other—

$$(2) \text{tang. } \theta < 90^\circ \dots\dots\dots (2)$$

or, in other words, the angle between the tangent of the curve at the springing and the horizontal line is an acute angle. Whatever may be the value of tangent  $\theta$ , which ranges from  $0^\circ$  to  $90^\circ$ , it is always assumed that the curve at the crown is horizontal, or, if  $\theta_1$  be the tangent to the curve at that point, then the conditions for the thrust generated there will be that—

$$\theta_1 = \text{infinity.}$$

While it is clear that the actual position of the "dangerous section" described in our former articles depends in great measure upon the amount of the loading and the manner in which it is distributed, uniformly, ununiformly, or locally, it has been shown not to have a very extensive range of situation. When the structures are of brick or stone, and are built up of regular joints, vertical, longitudinal, and transverse, the dangerous sections are usually termed the joints of fracture. In numerous examples, if we make  $\theta_2$  equal the angle made by the joint of rupture, or by the plane of dangerous section with the horizon, it has been found that  $\theta_2$  varies between  $36^\circ$  and  $47^\circ$ . This fact is more than sufficient in itself to furnish a perfectly satisfactory reason for increasing the thickness of the concrete-arch at these points which occur in the haunching. Although it may not be possible to strictly apply the principles and conditions pertaining solely to the linear arch to actual constructive examples, yet having once designed a linear arch, which under the assumed conditions is in equilibrium, we may proceed to design an arch which will adequately fulfil all the duties demanded of it. Two conclusions are necessary: one is that the depth of the actual arch-ring must be sufficient to allow of the linear arch lying at all points within the middle third of the depth of the real arch; and the other is that efficient means of resisting the thrust must be provided in the shape of substantial abutments and counterforts. It is manifest, from the statement that the profile of the linear arch must be contained in the middle third of the depth of the arch ring, that the linear arch virtually becomes the line of pressure of the real arch. To render the arch so designed stable and durable two other stipulations must be made: one that the angle of the joints of the voussoirs or ring-pens should not permit of their slipping one on the other, and the second that the intensity of the stress upon the arch ring does not surpass a reasonable limit, which is generally put at about one-tenth of the actual crushing strength of the materials. In practically designing arches of brick and stone as well as of concrete, if for some reason or other, as often occurs, the best material or ingredients are not procurable, it will be advisable to increase the depth of the arch ring by about one-fifth.

It was stated that in the cement-concrete arch described in the present article, layers of asphalt were introduced to prevent actual contact between the arch itself and the impost. Although apparently novel, the application of some description of medium between the joints at

different points of arches is a very old one. Years ago sheets of lead about  $\frac{1}{4}$  in. in thickness were used, although they were placed only at the crown and at the dangerous sections, and were not supposed to cover more than about the middle third of the entire sectional area of the arch ring. This material appears to have been used principally on account of its superior plastic qualities, which allow it to be squeezed or flattened, without losing its cohesive powers. As the result of experiment, cast lead of the thickness stated was proved to be able to withstand, without yielding, a pressure of three-quarters of a ton per square inch. It is true that sudden increase of pressure might exceed this limit; but in that case the yielding of the lead would also increase the area of its pressure, and thus the balance would be preserved. When over five times the above pressure was placed upon the same limit of surface, the squeezing or flattening-out action increased the area of pressure so rapidly that the actual pressure was augmented by barely one-fifth. The fact that in Classic times sheets of lead were placed between the joints of cut stone is a proof of the antiquity of the practice. Our next article will deal with the testing of the arch constructed of Monier cement, and a comparison will be made between the results afforded by them, and those of the arch built of ordinary cement concrete just described.

#### GRAPHIC STATICS.—X.

IT is a matter of common experience that the tendency of a force to cause a body to rotate about any given point depends partly on the amount of the force and partly on the distance of the line of action of the force from the point of possible rotation, or, in other words, that the tendency of a force to produce rotation round any point depends partly on the magnitude of the force and partly on the leverage with which it acts; in fact, as we shall presently see, the tendency of a force to cause a body to rotate about any fixed point is measured by the product of the force into the perpendicular distance of the point from the line of action of the force. The possible rotation is here supposed to take place, not simply about a point, but about an axis, which is perpendicular to the plane containing the point and the force.

**Definition.—Moment of a Force**—The product of a force into the perpendicular, drawn on its line of action from any point, is called the *moment of the force*, with respect to that point. Suppose A B, Fig. 37, to be the line of action of a force, O any point, and O M the perpendicular from O on A B; then, if P denote the force, the moment of P with respect to O is  $P \times O M$ . In this product the force and distance are each expressed as numbers, one of these being the number of units of force contained in P, and the other the number of linear units contained in O M. The moment unit is the moment of a unit of force acting at a unit of perpendicular distance. If the unit of a force be a pound\* and the unit of distance a foot, then the unit of moment will be a foot-pound, or, as some put it, a pound-foot; but this must not be confounded with the unit of work, which is derived from the same units of force and distance, and which also is called a foot-pound. Work involves actual motion under the action of a force, but a moment merely measures the tendency of a force to produce a motion of rotation.

Suppose O M, Fig. 37, to be a rod which can turn round O in the plane of a paper, then a force acting at M in the direction A B will tend to make the rod turn round O in the same direction in which the hands of a clock revolve; if the force act in the direction B A it will tend to make the rod revolve in the opposite direction to that of the hands of a clock. It is generally agreed to call this last kind of moment *positive*, and the first kind *negative*. This rule will be followed here, but some writers name the first kind positive and the second kind negative. Unless the force itself vanish, it is clear that the moment of the force round any point cannot vanish, except when the point is on the line of action of the force.

We already know that forces may be geometrically represented by straight lines; similarly, moments may be represented by areas. Thus, if

\* Weight is not force; the weight of a body is the result of the mutual attraction between the earth and that body. Strictly speaking, this is not the same in all places. Where no real ambiguity can occur, it is often convenient to use an imperfect expression instead of a longer and more complete one.

A B, Fig. 37, represent a force, and O M represent the perpendicular on A B from any point O, then the point O may be represented by  $A B \times O M$ , that is, by twice the area of the triangle O A B. This statement is perfectly plain if the same length be taken to represent both the unit of length and the unit of force; but it becomes rather obscure if the linear and force scales be different. Suppose, for instance, that the unit of length is a foot and that the unit of force is a pound. Let O M be drawn to the scale of an inch to the foot; then, if the force scale be an inch to the pound, the moment about O will be given in foot-pounds by twice the area in square of the triangle O A B. If, however, the force scale be at the rate of an inch to 10 lb., then the number of square inches in twice the area of the triangle O A B must be multiplied by 10 to obtain the moment in foot-pounds; in fact, if the moment of a force is to be represented by an area, the unit of area must be the area of a rectangle, whose adjacent sides are respectively the lengths which represent the units of force and distance.

**Reduction of Moments to a Common Base.**—When a number of moments are to be added together, or if some are to be added and some subtracted, the corresponding triangles may be reduced to a common base by any of the methods given in books on "Practical Geometry"; then, if the heights be added or subtracted, as the case may be, and the result multiplied by the number of units in the common base, the required result is obtained. Any two of the moments may be compared by simply comparing the corresponding heights; of course, a common height may be similarly used for the triangles instead of a common base. We shall take up no further time with these methods since much more convenient constructions may be used.

It readily follows that a moment, like any other measurable quantity, may be represented by a straight line, whose length, measured on the moment scale, will give the number of units of moment which the line represents.

The funicular polygon supplies us with the best means of dealing graphically with the moments of a number of forces. After a little practice in its use, the young student will find it a much less complicated matter than might be supposed from the written description.

To determine by means of the funicular polygon the moment of a single force P, Fig. 38 (a), about any point O<sub>1</sub>.

Draw a b, Fig. 38 (b), parallel to the direction O P of the force, and equal to it in magnitude; take a pole, o, draw P<sub>1</sub> P<sub>2</sub> parallel to o a, and P<sub>2</sub> P<sub>3</sub> parallel to o b, to meet a line through O<sub>1</sub>, parallel to the force in the points P<sub>1</sub> P<sub>2</sub> respectively; then P<sub>1</sub> P<sub>2</sub> is the funicular polygon of the force P with respect to the pole o, and we shall show that the moment of P about O<sub>1</sub> is equal to the product of P<sub>1</sub> P<sub>2</sub> being measured by force scale, and o h measured by linear scale.

Draw P M perpendicular to P<sub>1</sub> P<sub>2</sub>. Then  $P \times P M$  is equal to the moment of P about O<sub>1</sub>. And because the triangles P P<sub>2</sub> P<sub>1</sub>, o a b are similar, and P M, o h are drawn perpendicular to their respective bases, we shall have  $a b : o h :: P_1 P_2 : P M$ ; therefore,  $a b \times P M = P_1 P_2 \times o h$ .

Hence, if a line be drawn through any point parallel to the direction of a force, then the portion of this line (measured by force scale) intercepted between the two sides of the funicular polygon which meet on the line of action of the force, multiplied by the polar distance, is the moment of the force about that point.

The polar distance o h may be anything we please. If it be made unity on the linear scale, then the length of P<sub>1</sub> P<sub>2</sub>, read off on the force scale, gives the number of moment units. If o h be not unity, then the length of P<sub>1</sub> P<sub>2</sub>, read off on the force scale, must be multiplied by the length of o h read off on the linear scale—that is the number of units of force which P<sub>1</sub> P<sub>2</sub> represents must be multiplied by the number of linear units which o h represents, and the result will give the number of moment units. It is convenient to take o h to represent a round number of units, so that the multiplication is rendered easy.

When a number of movements have to be found, and the same polar distance is used for all, it is worth while to construct a moment scale. If H be the number of units (on the linear scale) in the polar distance, then one unit on the force scale would be equal to H units on the moment scale. As a numerical example, suppose the unit of force to be a ton, and the unit of distance a foot, then the unit of moment is a foot-ton. Let the force scale be  $\frac{1}{4}$  in. to the ton, and let the

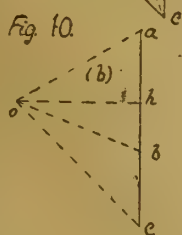
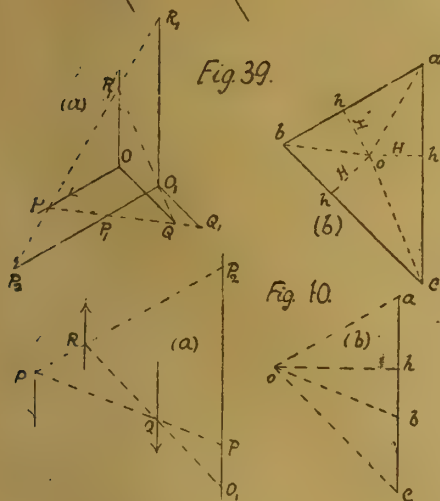
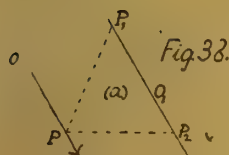
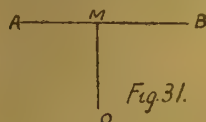


polar distance be 10 units on the linear scale; then on the moment scale  $1\frac{1}{2}$  in. will represent 10 units of moment—that is, a moment of 10 foot-tons.

If three forces be in equilibrium, the algebraical sum of their moments round any point in the plane containing the forces vanishes. (The forces, as we have already seen, must either meet at a point or be parallel, since they are in equilibrium.)

It is easily seen that, whatever point be taken, the moments round that point can neither be all positive nor all negative; there will be two of one kind and one of the other. What we have to prove, then, is that the moment which is *unlike* the other two is equal in *absolute value* to the sum of their absolute values. We will take first the case in which the forces are not parallel.

Let  $abc$ , Fig. 39 (b), be the triangle of the forces  $P$ ,  $Q$ ,  $R$ , Fig. 39 (a), which act along  $OP$ ,  $OQ$ ,  $OR$  respectively, and are, therefore, in equilibrium. Take for pole, Fig. 39 (b), the point  $o$  in which the bisectors  $ao$ ,  $bo$ ,  $co$  of the angles  $a$ ,  $b$ ,  $c$  meet; then the perpendicular distance of  $o$  is the same ( $H$ ) from each side of the



triangle  $abc$ ; and since each vector makes equal angles with the two sides which it meets of the triangle  $abc$ , each side of any corresponding funicular polygon must make equal angles with the two forces which it meets, and therefore also with lines drawn through any point and parallel respectively to these forces.

Let  $O_1$  Fig. 39 (a) be the point round which moments are to be taken. Draw, then, the funicular polygon  $PQR$  so that a side ( $QR$ ) passes through  $O_1$ ; draw  $O_1P_1P_2$  parallel to  $OP$  to meet  $PQ$  in  $P_1$  and  $RP$  in  $P_2$ ; draw  $O_1Q_1$  parallel to  $OQ$  to meet  $PQ$  in  $Q_1$ ; draw  $O_1R_1$  parallel to  $OR$  to meet  $PR$  in  $R_1$ . Then, as in Fig. 38 (a),  $P_1P_2 \times H$  is the moment of  $P$ ,  $O_1Q_1 \times H$  is the moment of  $Q$ , and  $O_1R_1 \times H$  is the moment of  $R$ . Here the moments of  $P$  and  $Q$  are both positive, and the moment of  $R$  is negative.

We have, then, in the triangle  $O_1P_1Q_1$ , the angles at  $P_1$  and  $Q_1$  equal, and therefore  $O_1P_1$  equal to  $O_1Q_1$ ; therefore  $O_1P_1 + P_1P_2 = O_1Q_1 + P_1P_2$ , or  $O_1P_2 = O_1Q_1 + P_1P_2$ ; but the angles  $P_2R_1$  of the triangle  $O_1P_2R_1$  are equal; therefore  $O_1R_1 = O_1P_2$ ; therefore  $O_1R_1 = O_1Q_1 + P_1P_2$ . Hence, multiplying these equals by  $H$ , we have  $O_1R_1 \times H = (O_1Q_1 + P_1P_2) \times H$ , or  $O_1R_2 \times H = O_1Q_1 \times H + P_1P_2 \times H$ —that is, the moment of  $R$  is equal to the sum of the moments of  $Q$  and  $P$ , if the moments be taken irrespectively of their signs.

The case in which the forces are parallel is shown in Figs. 40 (a) and 40 (b). This case needs no demonstration, because the force polygon becomes a straight line, and, wherever the pole is taken, the polar distance is the same for all the forces; also it is seen at once that in all cases the intercept which, when multiplied by  $H$ , may be said to represent one of the moments, is made up of the two intercepts which may in the same way be respectively said to represent the other two moments. Thus in the figure  $O_1P_2 = O_1P_1 + P_2$ .

In Figs. 39 (a) and 40 (a) it is plain that if any one of the forces, and therefore also its moment, be reversed, the reversed moment will be equal to the algebraic sum of the other two. Hence we have the following important theorem:—

The algebraical sum of the moments of two forces round any point in the plane containing the forces is equal to the moment of their resultant.\*

This may be expanded into the following:—If a system of forces acting in one plane on a rigid body be equivalent to a single resultant, the moment of the resultant round any point in the plane is equal to the algebraical sum of the moments of the forces.

For, take any two of the forces, then the moment of their resultant round any point in the plane is equal to the algebraical sum of the moments of the two forces. Combine the resultant of these two forces with another of the given forces, then the moment of *their* resultant is equal to the algebraical sum of the moments of the components—that is, to the algebraical sum of the moments of three forces of the system, and so on.

Reversing the resultant, and so obtaining the equilibrant of the forces, we see that when there is equilibrium the sum of the moments in one direction round any point in the plane of the forces is equal to the sum of the moments in the other direction; or, in other words, that the algebraical sum of the moments round any point in the plane of the forces vanishes.

It is plain also that when any number of forces are not in equilibrium, the algebraical sum of the moments of the forces round any point in their plane cannot vanish unless the point is on the line of action of the resultant. Also, if moments be taken round any point in the line of action of the resultant of any number of forces, the algebraical sum of the moments will vanish—that is, the sum of the moments of the forces which tend to cause rotation in one direction will be equal to the sum of the moments of those which tend to cause rotation in the other direction.

From the above we may readily deduce the following, which is called the *Principle of the Lever*:—When a body can only turn round a fixed axis, and is acted on by a system of forces in a plane perpendicular to that axis, such that the algebraical sum of the moments of the forces round the axis vanishes, the body will be in equilibrium.†

For the body to be in equilibrium, it is necessary and sufficient that the resultant of the system of forces shall be equal and opposite to the resistance exerted by the fixed axis—that is, that the resultant shall pass through the point in which the axis meets the plane of the forces. Hence, we see that the above condition (the principle of the lever) is necessary, because unless the algebraical sum of the moments vanish, the resultant cannot pass through the point, and that it is sufficient, because, when the algebraical sum of the moments vanishes, the resultant of the forces *will* pass through the point.

We see, then, that when the sum of the moments of forces which tend to cause a body to rotate in one direction is equal to the sum of those which tend to cause rotation in the opposite direction, the body will not rotate, and that, therefore, the tendency to rotate in one direction must be equal to the tendency to rotate in the other direction. It is easy to infer from this that the tendency of a force to cause a body to rotate about any point is proportional to the moment of the force round that point.

It must not be supposed that the principles dealt with in this and the two preceding chapters are interesting from a theoretical point of view only; it will be found, as we proceed, that their practical importance can hardly be overestimated.

\* It is believed that the above method of demonstration is entirely new.

† This principle applies whatever the shape of the body may be. When the body is a lever, the fixed axis is called the *fulcrum*.

We shall next consider a few of the many applications of the foregoing reasoning and constructions.

J. C. PALMER.

## THE POSITION OF CHOIR AND ORGAN IN CHURCHES.

THE Bishop of Chester writes to the *Times*:—  
“The Upper House of the Convocation of York recently requested the President to appoint a committee to inquire into and report on the considerations which should determine the position of organs in churches. Since then, as mover of the resolution, it has been my privilege to receive proofs of the interest taken in the matter by organists and choirmasters of the highest authority, and, as the work of a committee is aided by public attention, I would ask leave to bring the subject before your readers. It obviously has interest not only for musicians, but for architects and church-building committees, for diocesan chancellors—who are constantly being asked to grant faculties for the removal of organs—and for the lovers of vocal and instrumental music through all denominations.

“As is well known, the dominant fashion—‘a perfect mania,’ ‘a fashionable folly,’ are terms used by two of my correspondents with regard to it—is to place organ and choir at the east end, even in small district churches, and to do this as a matter of course, with little or no discrimination, forgetting that—to quote Sir John Stainer:—

It is most difficult to lay down any general law as to the proper position of organs in churches, because so much must depend upon (a) the shape and ground plan of the church, (b) its size, (c) its acoustical properties, and (d) the character of its services.

“That both the importance and the many-sidedness of the question have been already recognised will be seen if I can be permitted to quote rather copiously from a valuable document, for the use of which I am indebted to Sir Walter Parratt's kindness. Some years ago he served on a committee, jointly nominated by the Royal Institute of British Architects and by the College of Organists, to consider musical requirements and arrangements in churches. Unfortunately, their report did not reach the final stage, and was, therefore, lost to the public; but I learn that there was substantial agreement upon the principles and recommendations contained in the draft report, from which the following extracts are taken. I cannot but think that, if this draft could be placed at the disposal of the York Committee, their work would be much more than half done, and done under particularly advantageous conditions:—

After a careful review of the arrangements which are now usually made for the accommodation of the choir and organ, the committee desire to record the following observations:—

- (a) That the arrangements are generally defective.
- (b) That there is much misconception as to the best positions for the choir and organ in their relation to each other and the congregation.
- (c) That the space allowed for the modern organ is often insufficient.
- (d) That, on musical grounds, the old position at the west end for both organ and choir is, in general, the best.
- (e) That although, for ritual purposes (following the ancient English cathedral and collegiate arrangements) a vested choir is placed in the chancel, yet that, where there is a chancel arch, central lantern, or transepts, the sound becomes intercepted instead of passing into the body of the church; moreover, where the chancel is narrow, antiphonal singing cannot produce its proper effect.
- (f) That, when the placing of the choir in the chancel (according to recent custom) has involved the removal of the organ also, it has usually resulted in cramming the organ within some confined space or “chamber,” by which the tone has been damaged, and its beautiful qualities and real efficiency impaired.
- (g) That the arrangement alluded to above is not the most advantageous for the support and encouragement of congregational singing.
- (h) That these defects are more or less the result of adapting new customs and requirements to old buildings, and are not always to be avoided.
- (i) That, as a result of the general improvement in knowledge and taste, the increased facilities for the musical rendering of the services, and the more frequent bringing together of large bodies of singers and instrumentalists, the provision of better accommodation for them is a problem which must be considered.

### AS TO NEW CHURCHES.

The main object of this committee is to promote the improvement and development of the arrangements of new churches, and they have taken as their basis the musical requirements of a large town church; these requirements would necessarily be modified for small town or country churches.

There would appear to be but five positions in which the choir can be conveniently placed in a church:—

1. At the west end of the nave.

It is commonly admitted by musicians that the most effective position for the organ is at the west end; but



this position is not always advisable if the choir be retained in the chancel.

2. In galleries facing each other in the nave.  
The advantages claimed for seating the choir in galleries (similar to the ancient "minstrel galleries") on the north and south sides of the nave are as follows:—  
(a) The better support of congregational singing; and  
(b) the opportunities afforded for antiphonal effects. [All "galleries" are subject to special conditions.]

3. Immediately outside the chancel screen.  
4. In the chancel aisles.  
5. In the chancel.

With regard to these latter positions, it is advisable, in planning a new building, in order to obtain the openness and space requisite for the sound to reach all parts of the building, that a "chancel arch" should be avoided, and the choir thus placed under the same roof as the congregation. This will enable the clergy as well as the choir to be properly heard.

In churches exceeding 150 ft. in internal length the plan of placing the main choir at the west end and a "ritual choir" in the chancel may be adopted.

#### AS TO EXISTING, MODERN AND ANCIENT CHURCHES.

In dealing with existing churches, whether ancient or modern, the principles set forth in the "recommendations" should, as far as possible, be observed; but each case should be individually considered. In those places, for example, where there remain a western organ and gallery of interest, at a distance of not more than 50 ft. from the choir seats in the chancel, it is desirable that such should be retained *in situ* and used; and where the distance is more than 50 ft. a small additional eastern organ to support the choir is recommended.

#### RECOMMENDATIONS.

No. 8. That the term "organ place" be adopted, because it is more comprehensive (including gallery, &c.), and because the term "organ-chamber" is misleading, inasmuch as a chamber (or inclosed place) has been determined to be not suitable for an organ.

No. 13. That the organ should never be placed between the choir and congregation.

No. 14. That the sound of the organ should not have to pass over one-half of the choir to reach the other.

No. 15. That when possible the organ should be equidistant from both halves of the choir.

No. 16. That the choir be placed on raised floors, or in low, projecting galleries architecturally treated.

That Sir Walter Parratt is still of the same mind is shown in recent letters from which I am allowed to quote. Thus, he writes:—

Personally, I favour the west-end position for the organ, and I should place the choir halfway up the nave on each side. Many churches have narrow chancels from which neither organ nor voices can be heard, and the congregation finds itself without encouragement to sing, and without support and control if it makes the attempt. I am, of course, well aware that considerations of space and ritual make the removal of the choir difficult, and even distasteful to many people. But I am convinced that in many churches congregational singing is ruined by the present arrangement.

It is noteworthy that both Sir John Stainer and Sir Walter Parratt look forward to a time when architects will be less conservative, and have the courage to adopt more suitable arrangements for musical purposes. They both think that "the experience of our modern wants shows the superiority of the Greek cross as a ground-plan." Sir John remarks that "music is not the only thing which would gain by a fundamental change in our ideas of 'propriety' and 'respectability' in church plans."

#### CELTIC CROSS AT LLANBADARN FAWR.

THESE sketches were made during the visit of the Cambrian Archaeological Association to Aberystwyth and neighbourhood, September, 1896, by Mr. Robert Williams, F.R.I.B.A. St. Paternus founded Llanbadarn at the very end of the 6th century or very early in the 7th, and possibly this stone was originally erected to his memory; if so, it is over twelve centuries old.

The monolith stands 8 ft. 3 in. above the ground, and, according to the sexton, who saw it set up in its present position some twenty years ago, 3 ft. of its length is buried in the ground in front of the south porch. In section it is 9½ in. by 8½ in. at the ground line and 12 in. by 6 in. at the arms of the cross. The stone is probably syenite or syenitic granite. The workmanship is, even after accounting for the long years of weathering, somewhat rude, yet the ancient artist used much skilful ingenuity in working out his panels, knots, and figures. The drawing was made in ink on the spot. Taking Fig. 2 as the front, Fig. 3 would be the right-hand side, Fig. 4 the left, and Fig. 1 the back, which faces the porch. An example of the Celtic artist's love of intricacy is found in studying the fourth panel from the bottom of Fig. 1, the interlaced work of which is made up of three separate links so intertwined as to take some time to unravel. On the principal face, Fig. 2, there are shown on the fifth panel from the bottom some of the usual lizard-like figures; below is a figure terminating in a spiral and portion of a Greek fret. There is the semblance of a nimbus over the head, and it may be meant for a representation of the Saviour. The edge, Fig. 4,



FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

has simple interlaced rope work, while the other is ornamented with a very distinct Greek fret pattern. The stone is long and slender, and it is marvellous that it has remained intact so long.

#### METROPOLITAN STREET IMPROVEMENTS.

A LIST of the street improvements in the Metropolis contemplated by the Improvement Committee during the present year has just been presented to the London County Council. The localities of the suggested improvements are Rosemary Branch-bridge, Hackney and Shore-ditch; Roehampton-street, Westminster; Albert Embankment, Lambeth; and York-road, Battersea and Wandsworth. In the first case, it is proposed to rebuild the Rosemary Branch-bridge over the Regent's Canal. The total cost of the work is estimated at £6,800, towards which the vestries of Shoreditch and Hackney are each to be asked to contribute.

The proposed improvement in Roehampton-street, Westminster, is a continuation of the thoroughfare to provide better access to the new streets proposed to be laid out on the Millbank prison site. The estimated net cost of the work, including the acquisition of property, is £5,700.

A more ambitious improvement is suggested at the Albert Embankment, Vauxhall. The proposal is that the Council should undertake, as a county improvement, the widening of the part of the Albert Embankment formerly called High-street, Vauxhall, between Vauxhall-walk and Kennington-lane. The present width of the road varies from about 40 ft. to 60 ft., and it is proposed to make this 60 ft. throughout by setting back the eastern side. The estimated cost of the paving and other works is £3,700, and of the property, after deducting recoupment, £30,000, making together £34,000.

A fourth suggested improvement is the widening of York-road, Battersea, between Falcon-road and Wandsworth Station, a work which has been contemplated for half-a-dozen years past, and which cannot be longer postponed without grave inconvenience. The scheme embraces the widening of the portion of the York-road from near Falcon-road to Wandsworth Station. The total net cost of the complete scheme is estimated at £80,140. Nearly the whole of the property to be acquired for the improvement consists of fore-courts, and the estimates of the cost have been prepared on the assumption that Parliament will grant the Council power to acquire, where necessary, the fore-courts only, instead of being compelled to purchase the houses as well. In fact, the committee consider the granting of this power should be a condition of the carrying out of the improvement, as otherwise the cost of the property would be prohibitive. It will accordingly be necessary for the Council to ask Parliament to exempt them from section 92 of the Lands Clauses Consolidation Act, 1845.

The estimated net cost of the four suggested improvements, without deducting contributions, is £126,650; and after deducting contributions, £102,487.

The Hornsey Urban District Council have given instructions to their engineer and surveyor to prepare plans and estimates for the erection of public swimming-baths in Tottenham-lane. Application is also to be made to the Local Government Board for sanction to obtain a loan for the erection of a public library at Hornsey, almost opposite the site for the public swimming-baths. The plans for this library are being prepared by the engineer. The council have further applied to the Local Government Board for sanction to borrow £2,000 for the installation of plant and machinery at their destructor works for the manufacture of clink.





TEMPLE BAR IN THE REIGN OF JAMES I.

## TEMPLE BAR AND STATE PAGEANTS.\*

THIS interesting and well got-up little "historical record in commemoration of the Diamond Jubilee" is altogether above the average of the "literature" that is so plentifully adorning the bookstalls just now. Mr. Henry Johnson writes with knowledge and discretion, and Miss Elsie M. Cluff has charmingly reproduced the old prints that illustrate the text. The little volume is excellently printed, and is in every way creditable to the long-established and enterprising firm whose emporium is now almost an historical fixture of the famous thoroughfare in which it is situate.

In many of us, who remember the old gateway, it will awaken regrets, and revive comparisons with the hideous "Griffin" which perpetuates the bad taste of Sir Horace Jones and the folly of the City of London. There was no earthly need for the removal of Temple Bar at all. It had to go, like its predecessors, in deference to the cry for "improvement" we suppose, and it is well that a popularly written little brochure like this should recall some of the stirring associations which cluster round it, and the older gates that disappeared in their turn to make room for it. How numerous, and how intimately connected with the story of England those associations are! The clashing steel of the Plantagenet warriors, the faction cries of the wild adherents of York and Lancaster, the lavish pageants of the Tudors, the roystering of Stuart gallants, the tramp of Oliver's grim Ironsides, the cries of City 'prentices, the turbulence of the Templars, and the riots of Alsatian bullies—we hear and see them all in imagination as we recall the grimy old gate where neither Queen Victoria nor her successors will ever knock again to demand entrance into the domain of the Lord Mayor.

Temple Bar dated its origin as far back as the 13th century. Already, in the reign of Henry III., the great city began to grow beyond its ancient walls, especially towards the west. Lud Gate and New Gate had long ceased to be its real boundaries; but Fleet-street and "Le Strand" were dangerous thoroughfares for all that, and plundered citizens and waylaid wayfarers at last insisted on the Lord Mayor taking the matter in hand. Doubtless there was the usual meeting at the Guildhall; anyhow the king was approached, and permission granted to the citizens to fortify

their outlying thoroughfares. So at the top of Fleet-street, at the top of Holborn-hill, at White-chapel, and at other places posts and chains were set up, and sturdy well-armed watchmen stationed to arrest evil-disposed persons. A few years later the first "bar" was set up at the entrance of the Strand—a substantial one, but only of timber, and this, from its proximity to the new Temple erected by the Knights Templars, who had removed thither from Holborn in 1185, became known as "Temple Bar."

The existence of Temple Bar was soon menaced by vicissitudes. After the battle of Evesham, for instance, posts and chains were packed off to the Tower as a punishment for the rebellious attitude of the citizens to the conquering king. They were evidently allowed to be reinstated later on, and as Fleet-street became populous and the houses increased in wealth and dignity, a more substantial defence was needed than bars or posts or chains. It was probably in the third Edward's reign and somewhere between 1327 and 1377 that the first timbered gateway was set up; through this gate the Black Prince rode with his prisoner, John of France. In 1381, when Wat Tyler's justly-incensed followers attacked and burnt the Savoy Palace, Temple Bar, too, was destroyed. It was not till the reign of Henry VIII. that an archway and gates superseded the slighter erections that followed that put up in Edward III.'s reign. Through this Temple Bar, "newly painted and repaired," was borne the litter of the ill-fated Anne Boleyn, as she was carried from the Tower to be crowned at Westminster. Of this gate we get a fairly good illustration, reproduced from a curious old print in the British Museum. In it is portrayed the Coronation procession of Edward VI. making its way from the City to Westminster. Through the same rode good Queen Bess to her Coronation. Towards the end of her reign a new "Bar" was set up of wood, and of some pretensions, as may be seen in the reproduction of an old water-coloured drawing in the Grace collection at the British Museum, which we reproduce by the courtesy of the publishers.

This structure escaped the violence of Cavaliers and Puritans during the Rebellion, and passed unscathed through the Great Fire; but when the City was nearly rebuilt, Sir Christopher Wren prepared a design for a Bar of stone, which was completed in 1672, and which for 205 years retained its place, growing richer year by year with memories of brilliant scenes and famous men

We agree with Mr. Johnson that it should have been re-erected on the Thames Embankment, instead of fooling away £10,700 on the bizarre affair that now marks its site.

## WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—XIX.

BEFORE quitting the columns or pillars, which have afforded the subject matter of the articles immediately preceding, it seems desirable to offer a few comments on the methods by which the calculations relating to their strengths are effected. These remarks must, of necessity, be brief and pointed, and the examples selected will be those of the commoner types of pillars only.

When we consider the many sections and various forms of girders and columns which are used in modern structures, the multiplicity of arrangement and design becomes somewhat confusing, and the question naturally arises, How does the designer know the correct form and section that should be given to each member of a given structure? In order to do this he must be capable of estimating the kind and amount of load that comes on each element of the structure, he must be acquainted with the many different sections of material readily obtainable, and he must know how to combine these sections in an economical form, so that its component parts are placed to the best advantage; he must also have a good knowledge of the many methods in use for connecting the various members of a structure together, with the maximum of strength and the minimum of labour and cost, and he must be able to calculate the strength of each member, and so proportion it as to insure its stability under the heaviest load that may come upon it. To treat these subjects with fulness would absorb the whole of our space, to the neglect of that practical treatment which it is desired to give this series; moreover, time would be wasted in the endeavour to reconcile various formulæ and theories which abound in works devoted to this subject. A few concise remarks, therefore, are all that can be offered.

Roughly speaking, we may for the present purpose divide the elements of a structure into three classes, viz., beams, columns, and ties. When the section of a member lies at right angles to the load imposed upon it, such as a flooring-joint or girder, it is subject to bending actions, and must be treated as a beam; when the section lies in a

\* Temple Bar and State Pageants. By HENRY JOHNSON. London: Partridge and Cooper, Fleet-street, E.C. 1s.



line with the load which it has to sustain, it is either a tie rod in tension or a column in compression. To obtain the correct form and section of any structural element it is necessary first to ascertain the class and the amount of stress which it has to sustain. Frequently this is a very simple matter; sometimes, however, it is by no means an easy task.

Omitting the ties in this connection, consider a familiar example, say, the end elevation of a railway goods station which is arranged for the entrance of goods, trams, and lorries on the ground floor, and, say, one or two floors above for the storage of grain or goods. The first thing to note is the absence of a continuous end wall down to the ground line; instead of which the upper floors are carried by a system of iron or steel girders, which are in turn supported by columns at intervals, between which are the huge doorways for the passage of the traffic. Here we have good examples of simple beams and columns. The beams have each to carry their share of the walls, floors, and roof above them, and to transmit this load to the columns, which in turn have to transmit the thrust to the ground. The same conditions and stresses which apply to the columns also apply to all kinds of pillars and struts, whether they stand perpendicularly or in any other direction.

The columns, our present subject, must be dealt with under two heads—viz., short columns and long columns; with the former it is only necessary to equate the resisting area of the column to the load upon it, considering the latter as exercising simple compression only. If the length of a column exceeds the diameter by more than, say, 5 or 6 to 1, then a different method of procedure must be adopted, since long columns do not fail by mere compression only, but by reason of a compound stress, which is composed of the longitudinal pressure, and of a bending action combined, due to the curvature of the column. A short column, which is too stiff to admit of flexure before failing, can only fail from simple compression. A long column, by reason of its flexibility, will curve before it fails, and in so doing places the inner fibres of the curve in compression and the outer fibres in tension, and so practically fails in the same manner as a beam.

There are several different formulas obtainable for estimating the strength of columns—the names of Euler, Hodgkinson, Gordon, and Rankine are closely associated with these formulas—and it remains for the practical man to select that which will suit him best. The writer has used the rule based upon Euler's theory, given by Professor Unwin in his "Machine Design," for many years. It is given below, and is, perhaps, the most correct approximation to the truth; it can be applied to columns of any cross-section and of any material. The formula is varied slightly to suit different kinds of columns.

The strongest column is that which resists flexure most efficiently; this quality is obtained by fixing both ends in a substantial manner, an easy matter when arranging columns for supporting floors, &c. Fig. 54, p. 588, shows a good head or foot attachment for a joist section when doing service as a column. Fig. 74, p. 623, shows a good base and cap for a column built up of plates and angles. Fig. 95, p. 803, illustrates a good fixing for circular wrought-iron or steel columns. It is not always possible to secure a compression member in a firm manner, since both ends of long columns have sometimes to be secured by pin-joints; this often occurs in roof struts, sheer poles, and in pin-connected bridges. These are obviously more liable to curve under their load than the more substantially fixed ones, and proper allowance must be made for this tendency when deciding their section.

These different methods of fixing long columns affect the length of the arc of curvature which they naturally take before giving way; for instance, a column secured only by pin-joints will have an arc of curvature extending the entire length of the pillar, while one which is fixed at both ends will only develop an arc of one half of the total length of the column. So that by fixing the ends of a column it is about twice as strong as though it were pivoted at both ends. The breaking load of long columns fixed at both ends is equal to—

$$4 \pi^2 \frac{EI}{l^2}$$

Where— $\pi = 3.1416$ .  
E = modulus of direct elasticity.  
I = least moment of inertia.  
l = length of column.

If both the column ends are pivoted, the formula is simply

$$\pi^2 \frac{EI}{l^2}$$

If one end is fixed, and the other end pivoted, the formula is—

$$2 \pi^2 \frac{EI}{l^2}$$

The direct modulus of elasticity, E, for wrought iron is 29,000,000; for steel it is 30,000,000. The moment of inertia I for simple sections is easily calculated from well-known formulas; for instance, for a square section—

$$I = \frac{S^4}{12}$$

Where—S = length of side.

For a solid circular section, such as a steel pile for a pier—

$$I = d^4 \times .0491.$$

Where—d = the diameter of section.

The formulae for values of I for other sections may be found in any textbook dealing with stresses.

Of late years, however, column sections, like other elements of construction, have undergone great developments. Cast iron columns of simple section are being superseded by the iron and steel columns of complicated sections for special purposes, selections from which have been illustrated in the preceding papers. Some difficulty is, therefore, often involved in estimating their strengths. For instance, the formula for the moment of inertia of a simple annular section like an ordinary hollow circular column is—

$$(d_1^4 - d_2^4) \times .0491.$$

Where— $d_1$  = outside diameter,  
 $d_2$  = inside diameter.

But to write a formula to suit some of our modern built-up steel column sections would be a big task, and a still bigger task to work it out. There is, however, a rule which holds good for practically every conceivable section. It may be stated thus:—

To find the moment of inertia of any cross-section made up of a number of simple figures:—

Rule:—Find the moment of inertia of each of the simple figures about an axis traversing its centre of gravity parallel to the neutral axis of the complete figure, then multiply the area of each of the simple figures by the square of the distance between its centre of gravity, and the neutral axis of the whole figure. Add all the results together for the moment of inertia "I" of the whole figure.

It will have been noticed by those who have perused the papers immediately preceding, that many modern column sections and beam sections are identical; this is simply a matter of convenience. But the best section for a beam or girder is not the best section for a column, and vice versa. The ideal section for a column is the hollow cylinder; it is almost needless to add that this is not the ideal form for a girder. The best section for a girder is well represented in the rolled joist, or H section. But a joist section is not suited for a column so well as it is for a beam. As a beam, the metal is placed to the best advantage where it is opposed to the tensile and compressive stresses on the flanges. If, however, we were to take a joist section and lay it on its side, and then attempt to put its proper load upon it, it would probably collapse at once. With columns, unlike beams, it is impossible to effect an arrangement conformably with maximum stresses with unsymmetrical sections; but the weakest way of the section must measure the true strength of the column. Using, therefore, a joist section for a column involves waste of material, because we can only utilise its least moment of inertia. To illustrate this take a 12in. by 6in. joist section; its vertical or greatest moment of inertia = 370, while its horizontal or least moment of inertia = 32, and it is the latter that would have to be reckoned on, because, used as a column, the joist will curve and fail in its weakest direction. We can, therefore, see at once that a circular section is most economical for a pillar, because an equal resistance to curvature is offered in every direction.

The large annular section is represented in wrought iron and steel by the riveting up of a number of tubes, composed of plates, having either lap or butt joints, examples of which sections have been given.

Several common sections are evidently derived from the circle, and possess the advantages of being cheaper to build up, and of furnishing by their flanges points of attachment for ties and

other details. Thus Fig. 51, p. 449, illustrates a cheaper and more convenient form for ordinary columns derived from the tubular section. It is composed of a number of channel sections specially rolled for the purpose, the web of the channel being flat; or in the Phoenix column, Fig. 48, curved to form the diameter of the column, and the flanges are set outward to make a fair joint with their fellows.

In calculating the moment of inertia for such sections as these, the simplest method is to first reckon I for the tubular section, Fig. 48, and then add in "I" for such flanges as come into play in the weakest direction, calculating these according to the rule given above, care being taken that allowance is made for bolt-holes.

When column sections are put together with channels whose webs are not curved, thus forming a hexagon section instead of tubular; this form, for all ordinary purposes, may be calculated as if it were circular, the deviation being but slight. Of course, in larger columns it more nearly approaches the circular form on account of the increased number of sides. A stronger form of this section is given in Fig. 53, in which bulb-bars are inserted between the flange joints. Note, too, should be made that the bulbs are placed where added section is most needed—i.e., on the outside, thus giving a higher value for I, and so increasing the strength of the column.

Starting from this first departure from the circular form, there are many varied sections, as hexagon, octagon, &c., in use, some examples of which are shown in Figs. 80, 81, 82, 83. To calculate I for some of these sections requires a considerable amount of patience, but it is comparatively straightforward if the rule is followed step by step.

It was just now pointed out that joist and channel sections alone do not form economical columns, because reliance can only be placed upon the least value for I of any section used as a column. For this reason the placing of additional flanges on a joist as Fig. 44, p. 449, would not help it very materially as a column, although these flanges would give it considerable strength as a beam, loaded the deep way of the section. Even a combination of two joists and plates as Fig. 45, p. 449, does not give a very economical section, because there would still be a considerable difference between the greatest and least moment of inertia. But Fig. 59, p. 589, should be a good combination from an economical point of view.

Dealing with the square forms, perhaps the best section for a light column is to be obtained by bracing together a series of angle sections, as in Figs. 63 to 66, p. 589. A strong form is obtained by plating the entire length of the column, thus forming a box, and calculating the plates as webs; if, however, there is sufficient strength in the angles alone, and lightness of appearance is desired, and absence of surface for wind pressure to act upon; bracing bars or the plates may well be substituted in place of the solid webs. It is just a matter of choice between the tie-plates as shown in Fig. 66, or bracing-bars as shown in Fig. 65. Their use is simply to keep the angle-bars from giving way independently as separate columns, the length of which is determined by the pitch of the bracing or tie-plates. That is to say, each angle-bar is to be calculated as a separate column, the length of which is the distance between each bracing attachment.

One example of the rule just given for estimating the strength of long columns will render its application clear.

Given any steel column, say 20ft. long, the cross-section of which is represented by its least moment of inertia, which is, say, 130, we want to know what load will cripple it. Assuming that both ends are firmly fixed, the formula already given will be used—viz.:

$$4 \pi^2 \frac{EI}{l^2} = \text{breaking load.}$$

Putting this into figures—

$$4 \times 3.1416^2 \frac{30,000,000 \times 130}{(20 \times 12in.)^2}$$

Note that 20ft. must be brought into inches, because the moment of inertia is calculated in terms of inches. Then—

$$= 4 \times 9.86 \frac{30,000,000 \times 130}{57,600} = 62,500lb.$$

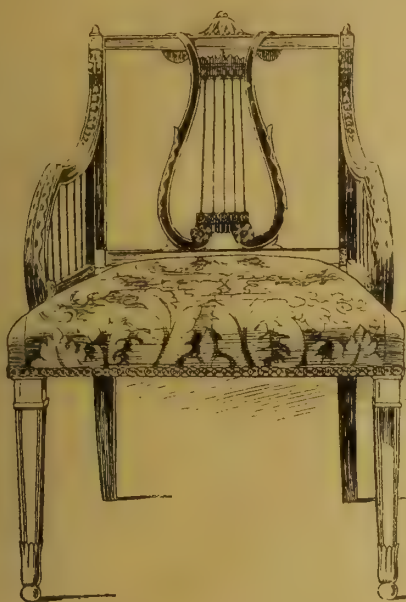
$$= 62,500$$

$$= 2,240', \text{ say 23 tons.}$$

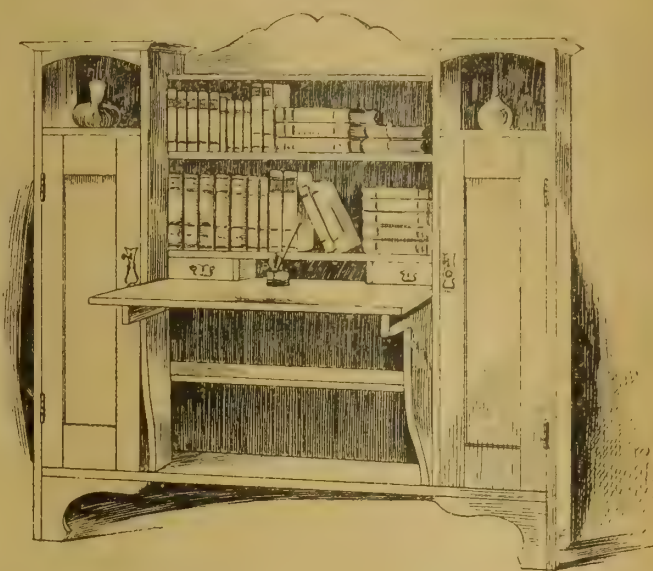
The working load should not exceed one-fifth of this for ordinary work.



## BOUDOIR FURNITURE



MAHOGANY ARM-CHAIR  
WITH LYRE BACK - CARVED BY SHERATON



WRITING TABLE & BOOKCASE IN OAK

DESIGNED & MADE BY J.W. SIMPSON, LONDON

The result comes out in pounds because the modulus of elasticity is taken in pounds. If E is represented in tons, the answer will be in tons. The subject of the calculation of I for various steel sections will be more suitably introduced after the forms of beams have been treated of, the consideration of which will begin with the next article.

J. H.

## BOUDOIR FURNITURE.

THE Chair illustrated herewith is of an exceedingly graceful and delicate character, and evinces the refined handiwork of the cabinet-makers of the 18th century. The carving is attributed to Sheraton, whose work it well accords with. The strings of the lyre and the uprights which fill in the spaces under arms are of stout brass wire, the woodwork is mahogany, and the seat is upholstered in red silk. The combination writing-table and bookcase is designed for a small room where space is a consideration; on occasion it would serve as a sideboard as well, roomy cupboards being provided for wine and biscuits, &c., as well as for stationery and private papers. The designer and maker of this simple but carefully thought-out piece of furniture is Mr. A. W. Simpson, of Kendal.

## HOLIDAY IN HOLLAND.—II.

ZAANDAM.

SITUATED at the mouth of the Zaan, Zaandam stands to Amsterdam precisely as Greenwich does to London. It is reached, for a few pence, in 20 minutes or so by rail, or, what is much pleasanter, in an hour's trip up the river by steamer. It was at Zaandam that Peter the Great lived for some time at the end of the 17th century when learning the trade of shipwright. The old wooden house, one story high and consisting of two rooms only, in which he resided is still intact; but a stranger might easily go all over the little town a dozen times without finding it. The fact is, with consummate care, the historical shanty has been built right over, so that it still stands where it always did, but yet in the midst, as it were, of a museum having a continuous corridor some 8ft. wide all around it. The Emperor slept in true Dutch fashion in the cupboard, and this, the chairs, rough table, curious fireplace, &c., are all, presumably, precisely to-day as they were when the great Czar himself lodged there and "did for himself" in 1697. Further, as a veritable example of a wooden residence of the period, it is particularly interesting. Zaandam and its neighbourhood is rich in wind-

mills. Some are very old specimens, and, from the dates that occur upon them, undoubtedly ground corn, much as they are doing now, during the time Peter the Great lived in their midst.

A good many years ago, in the summer of 1863, having just served a seven years' apprenticeship in Yorkshire, I came up to London again to seek work. Trade, generally, was very slack, and at every place I asked for employment, for more than a week, the same heart-sickening monosyllable, "No," was the only response received. One shop I called at was a ship-carver's down Wapping way somewhere—a rather rough old place, with heavy beams to its roof. There I was told the same avocation had been followed since long before the days of Peter the Great. Further, when Peter accepted the invitation of William III. to come over from Amsterdam to London, it was said he worked in this very shop. A curious custom that had been followed for considerably over 100 years in this particular workshop was that, when a carver engaged there died, his name, age, and date of death were cut upon the flat edge of his own mallet, and it was nailed up *in memoriam* upon the roof timbers. About a score of these interesting relics of passed-away toilers were to be seen thus preserved at the time of my visit. I have several times since tried to find the place again, but without success, and believe the building must be now non-existent. Since iron ships have become the order of the day, figure-head carvers have practically died out, and their mantles have found no successors.

Not very far from this old shop, I recollect, was the quaint old church of St. Matthias, the oldest one in Poplar. According to the tradition of those days, the teak pillars in this church originally served as masts in some of the ships forming the Spanish Armada. Further, there were some tumbledown, timber-gabled old houses near, in one of which great folk, such as Sir John de Pulteney (four times Lord Mayor of London), had once lived, to be succeeded later on as tenant by Sir Walter Raleigh, who smoked his first pipe in this country within its walls.

HAARLEM.

This is only half an hour's railway ride from Amsterdam. The famous old market here, with its groined roof supported by a central arcade of seven bays, is being restored. The ancient coats of arms in the gables of its high-pitched lead roof are being again decorated with colour, with good effect at present. As, however, vermilion is largely used, and is a pigment that does not well stand atmospheric changes, one does not feel sure of the durability of this aid to sculpture. Scaffold-

ing was also around the west front and south transept of the cathedral. A few miles from Haarlem is Zandvoort, a wild, sand-bound, desolate watering-place. A large arcade of half-empty shops has been built here upon the top of the Duns—civilisation at high pitch in a wilderness! The sea-water filters through the sand hills at Zandvoort, and, once through, is delightfully pure—not brackish in the least. Amsterdam is supplied with drinking water from here. It is the sweetest I ever tasted, especially when flavoured by a little "Schiedam"—the wine of the country!

ALKMAAR.

Alkmaar may be reached from the capital by either rail or water. The latter way, by the North Holland Canal, occupies three or four hours, and is a pleasant ride. Alkmaar means "All sea," but no sea is in sight, although canals flow every way. The new Hotel de Burg can be well recommended. It is small, but handsomely built of red brick, and the spacious entrance passage has a white marble floor. All the houses in the place are of brick, old and very quaint. The usual work of destruction is going on, however. At one house, once the residence of De Otter, its front façade embellished by a carved stone representation of an otter with a fish in its mouth, and bearing the date "A.D. 1614," some vandalistic workmen had just removed four superb old broad oak beams 20ft. by 1ft. by 8in., dating evidently from the time the place was built, and were substituting deal joists and a common panelled ceiling of the same material in their place. Dreadful!

HELDER AND NIEUWE DIEP.

These are two continuous towns, practically forming one—the Penzance of Holland. Land's End, some two or three miles further on, is known by a name which means "the house on the downs." It is reached from the town by a light railroad, which first commenced running at the time of our visit. The Island of Texel lies about four miles north. Helder, or, rather, Nieuwe Diep, is the great naval station of the Dutch. If the long-talked-of scheme of recovering and draining the Zuider Zee, by connecting the islands that run in a broken chain—on plan an arc—of about 100 miles, almost to the mouth of the Elbe, is ever put into effect, Holland would lose her dockyard here—at least, there would only be a dry dock, for all would become dry land! The group of islands in question are Texel, Vlieland, Terschelling, Ameland, Schiermonnikoog, Borkum, and Rottum. Steamers run several times a day from Helder to Texel,



and a postal sailing boat goes daily from there to Vlieland. From this point Terschelling may be reached in like manner. It is a most beautiful island. Ameland is not worth visiting, neither is Borkum, whilst Rottum is little more than a sand-bank. Schiermonnikoog is best got at by taking train at Harlingen (a Friesland port) to Veerwouden, and from there by steam tram on to Dukkum. At Dukkum a post-cart goes every morning to Oost Mahorn (the East Corner), from whence the *Posterijen* boat leaves each day at noon with the mails, and such passengers as may be bound for Schiermonnikoog. Harlingen is reached twice a week from London and Hull by steamer, and weekly from Leith.

## FRIESLAND.

The capital of this northern, and comparatively little visited, province is Groningen. This city has a population of about 60,000, and is well worth a visit. In Friesland, on the roads, the directing-posts, which are frequent, instead of quoting the distance the different places they point to are away, give the time an average walker will take to get there! One frequently comes across heronries thereabouts. Herons (*Ardea cinerea*) are, by the way, by no means rare birds in Devonshire. We rarely go down the estuary of the Exe or up the Teign river without seeing several, and in Powderham Park the herons nest in some ancient oak-trees close to the Earl of Devon's castle. There used to be a heronry in Shute Park, Axminster; but, curiously, 30 or 40 years ago, with one accord the birds migrated to fresh quarters amongst the woods at Stedcombe, near Axmouth. Herons are to be found at Sharpam, on the Dart, and there are herons at Warleigh and at Fremington, near Barnstaple. On the edge of the Exe on moonlight nights a dozen at a time may be seen waiting patiently for their prey.

Between Harlingen and Leeuwarden the rail passes several large tile-works, all of which have been erected during recent years, and are doing a brisk business. In Leeuwarden itself, a most refined building in red brick, with a Caen-like stone used for dressings, has just been erected in Ruiter's Kwarter, a cleverly designed front; the carved panels are excellent, and there are capitally-hammered iron ties and finials. In this town, near the railway-station, is a residence built in the form of a lighthouse ("What a getting-up stairs!"). We noticed another such edifice on the outskirts of Amsterdam; near Leeuwarden a large tar manufactory has been built lately; it covers several acres, and is of light brick. There is only one other tar manufactory in Holland. The soil hereabouts is a very light clay.

The steeply-pitched roofs of the barns one passes when driving along the country roads, or gliding noiselessly, and apparently motionlessly, along in the canal boats in Friesland, are thatched almost down to their eaves; they finish, however, with three or four courses of tiles, generally glazed. These barns are, as a rule, three times as large as are the farmers' residences to which they are attached.

The charmingly diverse finials and weather vanes upon the gables and roofs of farmhouses and barns alike are marked features; some, of course, are metal, but many others are of wood, cut into graceful outlines. The apse of one barn was crowned by a vane formed by two swans, back to back, with bent necks, much in the conventional attitude of the pelican in her piety when seen in outline. The churches almost invariably have the cock for a vane, a farmhouse never; but the latter often have an arrow.

## SCHIERMONNIKOOG.

In the BUILDING NEWS for July 31 last some notes of my own, written upon this island, occurred. Therein I mentioned that, although Dutchland, the entire isle had been purchased by Count von Berdorff, a German nobleman, and he proposed building a watering-place upon the western end of this most out-of-the-world place. Designs, which he showed me, had been made by Mr. Georg Thielen, architect, of Hamburg, for laying out the estate in a very ambitious manner, and he hoped the work would almost immediately commence. I have heard since, however, that the whole scheme has since fallen through, and, personally, am glad of it.

The island is of itself the most charming place conceivable to go to for those who pine for a long rest, whilst at the hotel of Mr. F. de Boer, the worthy Logementhouder, in the midst of the one little village there, one may "live like a lord" at very small expense indeed. This village consists

of three broad streets lined with low brick houses, their gables exhibiting charming old metal ties, and shaded by continuous rows of elms and lime-trees. The people themselves speak a Friesland dialect, and are strongly attached to their island; they call themselves neither Frisians nor Dutch, but simply Schiermonnikoogers. Many of their customs are most curious; for instance, every Whitsun-eve a large Maypole, with a cross-tree, is erected in the midst of the village; at one end of the spar is hung a bottle of beer, and in a basket at the other end a live cock; beside this, the pole is decorated with flowers and green boughs, whilst at top flies the Dutch flag. At midnight young and old dance around it, and continue these goodly calisthenic exercises until daylight, refreshing themselves the while, sundry times and oft, by drinking a certain brew of beer known on these occasions as "kallemooi." This word is a combination of two now obsolete 16th-century Frisian ones—"kalle" to come, and "mooi" fine. The festivities are kept up for three successive nights, at the end of which the pole is taken down, and the imprisoned cock restored to its owner. The sands of Schiermonnikoog are the most splendid imaginable, and the almost entire absence there of human beings is amply compensated for by innumerable birds rocking on the waves, diving for their food, or running, or flying over the sands; seagulls of several kinds, plovers, divers, and sandpipers. At low tide innumerable seals bask in the sunshine on the sandbanks, and when at eventide the sun sets in all its glory over the foam-crested waters, and the deep blue sky above melts towards the horizon in soft transparent hues of yellow and red, one lingers long, quite neglectful of the really necessary calls for supper and for bed. If a tired man can eat and sleep anywhere, surely it is at Schiermonnikoog.

## THE ZUYDER ZEE.

We have already touched upon the proposed reclaiming of this vast, if shallow, sea. The proposition has been seriously considered by the Dutch Government, and a special commission appointed by it to discuss the scheme have recently published their report. They consider the work possible, but that it would cost some £26,000,000, and take over 30 years to carry out; the building of the walls alone connecting the isles, and thus cutting off the sea, would take nine years. In the face of this large expenditure must be considered the fact that the reclaimed land would probably be worth even more money still. It is very unlikely, however, that the work will be attempted in our time.

And now, having brought these disjointed notes upon a very happy holiday to a greater length than was ever intended, they shall close.

HARRY HEMS.

The Chatham Town Council have received the sanction of the Local Government Board to borrow £20,000 for the purpose of erecting a town hall.

Mr. W. A. Ducat, an inspector of the Local Government Board, held an inquiry at Preston, Lancs, on Friday, in reference to application to sanction the borrowing by the Preston Rural Sanitary Authority of £9,000 for the purposes of water supply for the townships of Penwortham, Howick, Hutton, Longton, Little Hoole, and Much Hoole. Mr. John J. Myres, C.E., of Preston, the engineer of the scheme, explained the proposals.

The Hull Jubilee Committee received on Friday a deputation from the Hull Literary and Philosophical Society, who submitted a scheme for providing an art gallery for the town in commemoration of her Majesty's Jubilee. Mr. A. E. Seaton, president of the society, said they proposed to construct an art gallery 73ft. by 25ft. 6in. immediately over the present museum, having a vestibule 29ft. by 11ft. 6in., with cloakroom and other offices adjacent. The site was valued at £2,000. The Jubilee committee are asked to vote a sum of £600 to cover the cost of erection, and a guarantee of £100 per annum to cover the cost of management. The committee decided to adopt the scheme.

John Phillip's masterpiece, "La Gloria," which was purchased for £5,000 at the sale of Sir John Pender's collection last Saturday by the Scottish Board of Manufactures, was promptly sent to Edinburgh, and on Monday was placed in a suitable position in the Scottish National Gallery at the foot of the Mound. As the gallery was so recently renovated and rearranged, it has been decided not to disturb the walls meanwhile, but to place the new acquisition for a time on an easel in a conspicuous position in the centre room. Here it will remain until further additions give occasion for some alteration in the hanging.

## OBITUARY.

MR. GEORGE BUCHANAN, M.Inst.C.E., of Bucklersbury, died on Monday at his residence, Towerfields, Keston, Kent, aged 70 years. The deceased had been seriously ill from paralysis for twelve months. Mr. Buchanan had carried out engineering works of great importance in all parts of the world. He constructed the first railway in South Africa, between Durban and Port Natal. He also erected iron bridges, wharves, &c., for the Indian Government, iron piers in British Burmah, and rice and sugar factories for the King of Siam. He joined the Institution of Civil Engineers in May, 1857.

## CHIPS.

A lych gate has been placed at the entrance to St. Lawrence's churchyard, Bolton, Lancs, as a memorial of the late Mr. C. R. Jacon. It was designed by Mr. R. Knill Freeman, F.R.I.B.A., of Bolton, and was carried out by Messrs. Hatch and Sons, of Lancaster. At the same time the Jacon Memorial Organ, with two case fronts of wainscot oak, also designed by Mr. Freeman, was dedicated.

On the invitation of Mr. and Mrs. H. Ernest Leatham, the members of the Yorkshire Architectural Society paid a visit to Aldersyde, Dringhouses, on Saturday. The building has been erected from designs by Mr. Walter G. Penty, F.R.I.B.A., and his son, Mr. A. J. Penty, and is situated on the Tadcaster-road. Mr. Milburn, of York, executed the carving.

The town council of Leicester have decided to purchase an area of 174 acres of land near Hinckley-road for £28,500 as a public park, and to build an infectious diseases hospital on the Gilrose estate at a cost of £54,000.

A chancel screen has recently been placed in St. Mary's Church, Balderstone, as a parishioners' memorial of the founders of the church, the brothers Radcliffe, who built it in 1871. The new screen, which is of hammered iron, is surmounted by fretwork, an appropriate text of Scripture, a crown, and a cross. The screen was designed by Mr. Medland Taylor, of Manchester, the architect of the church, who also prepared the designs for an oak font cover, which has just been placed in the church as a memorial.

The new hospital, Dagenham, Essex, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At a meeting of a joint committee of the Halifax Corporation and of the Halifax Chamber of Commerce, held on Friday night, schemes submitted, by invitation, by Mr. B. W. Jackson and Mr. S. Utley respectively, for a railway from Huddersfield to the North, via Elland and Halifax, were considered and discussed at length. The meeting was adjourned till to-day (Friday) to enable the members to consider the plans more fully. It is the intention of the committee to formulate a scheme, and submit it to the directors of the Midland Railway Company.

The Eccles Corporation have received the sanction of the Local Government Board to borrow £5,158 for the construction of a main sewer for the Irwell Park, Salter's-lane, and Barton-lane districts. The corporation have also adopted a report by the consulting engineer, Mr. Brierley, C.E., for the provision of stone outlets in various parts of the borough, at an estimated cost of £4,928.

The Plans Committee of the Aberdeen Town Council sanctioned on Friday the erection of a large number of dwelling-houses in different parts of the city. The estimated value of the buildings is £18,500.

At a meeting of the Mersey Docks and Harbour Board on Friday it was agreed to grant an allowance of £5,250, in addition to the contract price, to Messrs. Monk and Newell, the contractors for the new graving dock at the Canada Dock, in the event of the work being completed in June, 1898, instead of September in the same year, as specified in the contract.

At the Town-hall, Blackburn, last week, Mr. Walter A. Ducat, Local Government Board inspector, conducted an inquiry into the application of the Blackburn Corporation for sanction to borrow the sum of £7,000 to pay off the balance of the capital debt on the Technical School, and also to borrow £7,686 so as to enable the corporation to purchase Raiton's old foundry and other property for the extension of the Technical School, and to form a new street from St. Paul-street to Nab-lane. The town clerk stated that £2,736 of the last named sum would go to the Technical School and £4,950 for the making of the new street. Mr. Bailey (borough treasurer), Mr. Stubbs (borough engineer), and Mr. King (secretary of the Technical School) gave evidence in support of the application. There was no opposition.



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"SALISBURY CATHEDRAL," BY TURNER.—THE NEW LIVERPOOL SCHOOL BOARD OFFICES.—ST. SAVIOUR'S HOMES, HENDON.—NEW QUARTERS FOR THE BOTANICAL AND AFFORESTATION DEPARTMENT, HONG KONG.—HOUSE AT WINCHFIELD.—BOUDOIR FURNITURE AND ARM CHAIR.

## Our Illustrations.

"THE CLOISTERS, SALISBURY CATHEDRAL," DRAWN BY J. M. W. TURNER, R.A.

TURNER's chief education was architectural; he was a pupil of Thomas Malton, and worked in Hardwick's office. Not only were buildings the first subjects upon which he tried his hand as a draughtsman, but some of his finest works are careful delineations of architecture. Turner's popularity is undoubtedly as great as ever, and, in evidence of this, a record price was obtained for one of his pictures the other day, when, in a total of four of his works, which obtained an aggregate of about £30,000, his drawing "Wreckers" fetched no less than 7,600 guineas. The strictly architectural drawing, which we have reproduced to-day from the original, now in the National collection at South Kensington, represents a careful study of the spire of Salisbury Cathedral, as seen from the cloisters, sketched long before Sir Gilbert Scott commenced his restorations there. Lately this spire had become exceedingly dangerous, but Mr. Thompson, of Peterborough, has thoroughly strengthened it, under the direction of Sir Arthur Blomfield, A.R.A.

## LIVERPOOL SCHOOL BOARD OFFICES.

THESE offices, now in course of erection, are situated between Sir Thomas-street and Cumberland-street, with buildings abutting against the two sides. It has, therefore, been necessary to resort to internal areas in lieu of the possibility of any side light. The ground floor is devoted to the male and female visitors' rooms, room for interviews with negligent parents, storekeepers' office, and outdoor pay-office, arranged round a large waiting-room in the central area. These rooms are approached from Cumberland-street, and have not necessarily any communication with the front and more official portion of the building. The principal offices are on the first floor surrounding the main staircase and area. The second floor is occupied by the boardroom and two committee rooms with ante-rooms, and retiring-room for members of the board. On the next mezzanine are conference room and retiring rooms for lady members, and on the top floor is a large examination room and library. The lavatories for the different departments are arranged on the mezzanines, and the caretaker's room occupies the back portion of the second floor, which is here carried up no further. The building in Sir Thomas-street is faced with Cefn stone, and the construction is fireproof throughout. The central staircase is being constructionally carried up with the building in arcaded form, of Hopton Wood stone, quarried and dressed by Messrs. Killer, of Middleton-by-Wirksworth. The contractors are Messrs. Thornton and Sons, of Liverpool, and the architect is Mr. Charles E. Deacon, whose plans were selected in a limited competition.

## ST. SAVIOUR'S HOMES, HENDON, N.W.

THESE homes are worked as a female penitentiary by the Church Army. The plan provides (1) six independent cottages, each with dormitory, sitting-room, kitchen, sisters'-room, bathroom, &c., built at the corners of a large quadrangle, with a fine oak tree in the middle, and connected by a covered-way on oak arches; (2) porter's lodge, and guest rooms, &c., in tower above; (3) dining-hall and general kitchen; (4) large and small laundries; (5) chapel; (6) workroom. All the framing, corridor, barge-boards, &c., are of English oak. The chapel is fitted with canopied stalls and gallery, with infirmary window, by Mr. H. H. Martyn, of Cheltenham, marble floor and steps by Messrs. Boulton, of Cheltenham. A reredos picture by Sir E. Burne-Jones is promised. The contractors are Messrs. Collins and Godfrey, of Tewkesbury; the perspective drawing is by Mr. Allan James, and the architects Messrs. H. A. Prothero, M.A., and G. H. Phillott, M.A., of Cheltenham.

## NEW QUARTERS FOR THE BOTANICAL AND AFFORESTATION DEPARTMENT, HONG KONG.

THESE buildings, which are now in process of erection, are intended for the accommodation of the outdoor staff of the Botanical and Afforestation Department. They are built of hard stone, laid in random rubble, with granite dressings and mouldings, &c. The roof is covered with a double course of Canton roll and pantiles. The work is being executed by Mr. Loong Cheong, contractor, from the designs of Messrs. Denison and Ram, architects, of Hong Kong.

## HOUSE AT WINCHFIELD.

THIS house was never carried out; but the architect, Mr. F. B. Wade, has given us a few notes of what was intended. One of the main objects was that there should be one very large room for occasional use; for this reason, the screen between the dining-room and principal sitting-room has folding panels. As regards the exterior a good broad effect of colour is aimed at. The lower story was to have been of brick, and the upper portion faced with Bath stone ashlar in large thin slabs, alternating with 6in. bands of the same going through the whole thickness of the wall. The roofs of the two south bays are supposed to be of copper, and the rest of the roof of brown stone shingles.

## CHIPS.

A new hotel, to be known as the Gate, has been built in Newdegate and Abbey streets, Nuneaton. The style adopted is Tudor, with half-timber work for the principal gables. Mr. Thomas Smith, of Cotton-road, carried out the undertaking from the plans and designs of Mr. F. J. Yates, architect, of Colmore Chambers, Birmingham.

The partnership hitherto subsisting between Francis Edwards, B. Wilkinson, and Frank Edwards, architects and surveyors, John-street, Adelphi, W.C., under the style of Edwards, Son, and Wilkinson, has been dissolved; as has also the partnership heretofore subsisting between H. Bray, E. H. Abbott, A. W. Dickens, and H. Lee, auctioneers, architects, surveyors, and estate agents, Warwick Court, Holborn, W.C., under the style of Bray, Dickens, and Co. The dissolution of partnership is also announced of E. O. Sachs and A. E. Woodrow, architects and surveyors, Waterloo-place, Pall Mall, S.W., under the style of Sachs and Woodrow.

A meeting of the parishioners of Holy Trinity, Bingley, have decided that it is desirable to erect a new church at Gilstead, in the place of the present mission church. Mr. John Walker, of Bingley, has offered to give the site, and a committee has been appointed to make inquiries.

The ancient and Royal Castle of Tamworth, the property of the Marquis Townshend, was offered for sale on Tuesday at Tamworth Town Hall. The town clerk, on behalf of the corporation, began the bidding at £1,000. Other bids were made, and eventually the town clerk bid £3,000, at which figure the property was declared to be bought by the corporation.

At Friday's meeting of the Edinburgh and District Water Trust tenders were accepted for laying a 27in. main, and for sluice valves in connection with the Talla water supply. The working drawings for the Talla reservoir were submitted by the engineer, signed by Mr. Hill, C.E., London. A sub-committee was appointed to make all necessary arrangements for the laying of a foundation or memorial stone at the commencement of the Talla reservoir and relative works, which is expected to be about the end of September.

## COMPETITIONS.

BRIGHTON.—The town council have invited the architects of the borough to send in competitive designs, with plans and specifications, bills of quantities and estimates, for the erection of artisans' dwellings which can, without loss to the Corporation, be let at rents not exceeding 5s. and 6s. per week.

CLEETHORPES.—The Jubilee Committee have chosen the design for the ornamental fountain to be erected on the Sea-road. The fountain will be surmounted by a dome and ornamental lamp, and the carrying out of the design, which is by Messrs. Macfarlane and Co., of Glasgow, will cost about £220.

COLCHESTER.—The proposal to invite competitive designs for a new town hall has raised some opposition from a noisy section of the ratepayers, who complained of the extra rates that would be involved, but the town council decided to persevere. The Municipal Offices (Special) Committee reported at the same meeting that they had approved a letter from the town clerk to the architects to the effect that there would be no objection to building over the south wing of the public library, up to the entrance, provided the harmony of the building was not unduly disturbed, and pointing out that the conditions omitted mention of a police recreation-room. As the present room facing High-street would be done away with, another would have to be provided. A letter had been received from Mr. J. M. Brydon inquiring whether one Court instead of two would be sufficient, there not being enough space to allow of two Courts, with accessories and good lighting, being provided. Mr. Brightwen Binyon had also written asking whether there was any objection to the students'-room in the Public Library being built over. Having regard to these communications, and to the difficulty that seemed to be found in making provision for all the accommodation required, the sub-committee had been reappointed to revise the schedule of rooms.

KIRKHAM, LANCs.—The Fylde Board of Guardians have decided to build a new work-house in place of the existing one at Kirkham, and to invite competitive designs for a building to accommodate 300 inmates, with facilities for extension to 500 beds. Premiums of £150, £100, and £50 will be offered, and it is proposed to appoint an assessor to adjudicate on the plans submitted.

The Madras Government has approved of the scheme for bridging the Godavery near Rajamundry on the East Coast Railway. The total length of the bridge will be 8,950ft. The well foundation for the piers is estimated to be sunk 70ft. to 85ft. below low-water level. The underside of the girders will be 13ft. above highest flood level.

The foundation stone of Christ's Hospital at Stammerham, near Horsham, Sussex, is to be laid on Founder's Day, October 23 next. A member of the Royal family will probably perform the ceremony. The buildings are to be erected from the plans of Messrs. Aston Webb and Ingress Bell, whose design, selected in competition, was illustrated in our issues of June 29 and July 6 and 13, 1894.

The opening of a playground at Longwood, Huddersfield, provided at the expense of Sir William H. Broadbent, Bart., M.P., of London, a native of the village, took place on Whit Monday. Measuring over six acres, the ground has been laid out under the supervision of Mr. Benjamin and Mr. Arthur Broadbent, brothers of the donor. About an acre and a half will be used as a playground, and the remaining portion, which is rocky in character, will be laid out with shrubs and flowers.

The new church of St. John the Baptist, which has been erected at New Springs, in the parish of Haigh and Aspull, near Wigan, was consecrated by the Bishop of Liverpool on Saturday afternoon. The church, which replaces an iron structure, will seat 505 adults. The contracts amount to about £5,230. The work has been designed and superintended by Mr. Medland Taylor, architect, Manchester, and the contractor was Mr. C. B. Holmes. The church is built of brick, and the fittings are of pitchpine.

A revolving observatory tower is being erected at Great Yarmouth by a syndicate. It consists of a hexagonal steel tower 150ft. high, surrounded by a circular revolving elevator. This elevator is raised or lowered, and it has a circular platform fitted with rollers and intended to revolve upon the elevator. The latter platform is provided with revolving chairs, accommodating 150 or more persons. While the elevator ascends and descends the tower, the platform revolves round it, thus affording an uninterrupted view of the surrounding country.





### CHIPS.

The commission for the execution of the memorial bust of the late Professor Pirie, to be placed in Aberdeen University, has been given to M. A. Boucher, of Paris.

Another of the windows on the south side of the parish church of Godmanchester has been filled with stained glass. It is a three-light window, and the upper portion contains three figures, representing Our Saviour with right hand uplifted, and an angel with long trumpet bearing downwards on either side. The three lower divisions are filled in with three figures, symbolic of Justice, Courage, and Humility. The work has been carried out by Messrs. Morris and Co., of Merton Abbey Works, Merton, Surrey, from a design by Sir E. Burne-Jones.

Branstone Church has been reopened by the Bishop of Leicester after partial restoration. The church embraces work of the Late Norman, Early English, and Perpendicular periods. The roof, dating from 1678, having fallen into a dangerous state of decay, has been repaired from plans by Messrs. Bodley and Garner, in sections, and as funds came in. The chancel and nave roofs, in English oak, have now been completed, every detail of the old work being embodied in the new. occasion has also been taken entirely to rearrange, refurnish, and repave the chancel, and alter the semi-pews and high seats in the nave and aisles. The total cost of what has been done is £900.

The new station at Boscombe, Bournemouth, on the London and South-Western Railway, has been opened by Mr. W. S. Portal, chairman of the company.

It has been resolved to proceed with the erection at Cambuslang, N.B., of a suite of buildings for public purposes, embracing a large hall to accommodate 800 and a small hall to accommodate 400. The cost will be about £2,000.

At the last meeting of the urban district council of Stapleton next Bristol, letters from the Local Government Board were read sanctioning the borrowing of practically the whole amounts of £952 for sewerage works, £3,890 for street works, and £575 for land purchase, in connection with which Local Government Board in inquiries had recently been held.

The memorial which has been erected at Thornhill, Dumfriesshire, to Mr. Joseph Thomson, the African explorer, was unveiled on Tuesday by Sir Clements R. Markham, President of the Royal Geographical Society. Designed by the sculptor, Mr. Charles M'Bride, of Edinburgh, the memorial is of Classical design, and is in the form of a truncated obelisk on a pedestal raised on three steps, with a moulded base and cornice. The four sides are panelled. One is occupied by a bas-relief representing a figure of Fame upholding a map of Africa, with palm trees and Mount Kilima-Njaro in the background. The whole is surmounted by a bust, in bronze, of Thomson.

A new company, under the title of the Aberdeen Granite Supply Association, is being formed in Aberdeen, with a share capital of £20,000. The importation of foreign granites is increasing, and in 1896 no fewer than 62 cargoes were imported into Aberdeen. It is one of the most profitable branches of the granite trade, and it has been decided to form a company to carry on, extend, and develop the trade.

A nurses' home is being built at Peterborough, in Bishop's-road, against the southern wicket of the cathedral precincts, on a site hitherto used as pasture. The building will be Elizabethan in style, and two stories in height. Mr. John Thompson, J.P., of Peterborough, is the builder.

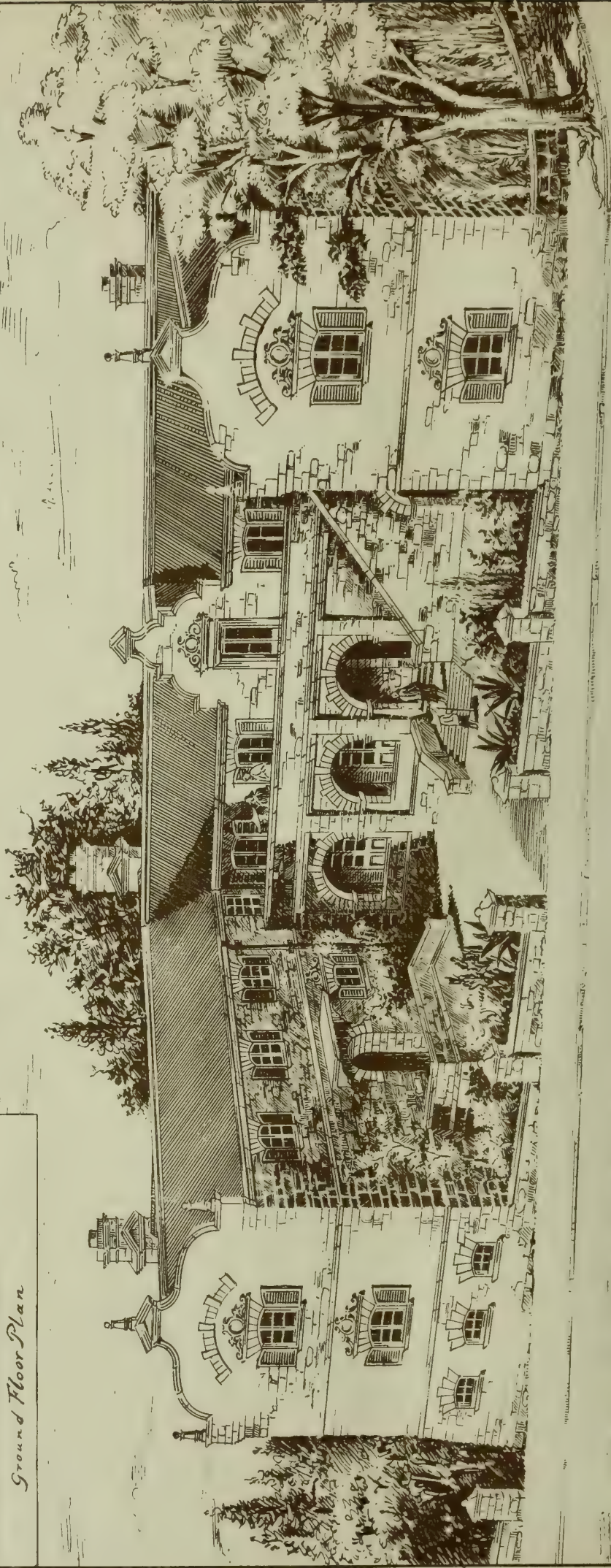
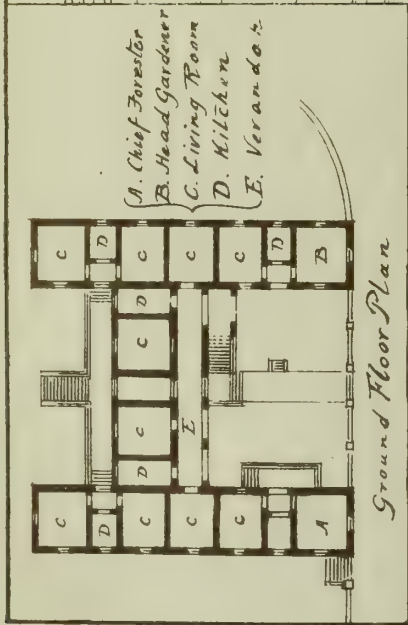
While it is still true that nothing is sacred to a sapper, the sapper occasionally lights upon the long lost foundations of sacred buildings. A case in point came to hand on Tuesday from Thessaly. During the excavations that were being made for the fortified works on Halkomata Hill in the Oeta chain the engineers discovered the ruins of a temple of the Doric order.

A new theatre is in course of erection near the Fulham end of Putney Bridge, from designs by Mr. G. R. Sprague. It is being built on the cantilever principle, and will seat an audience of 2,800 persons, the auditorium being 65ft. by 760ft., and the stage 76ft. by 45ft. The style of the decoration is Louis XIV. period, and the building will be lighted throughout by electricity.





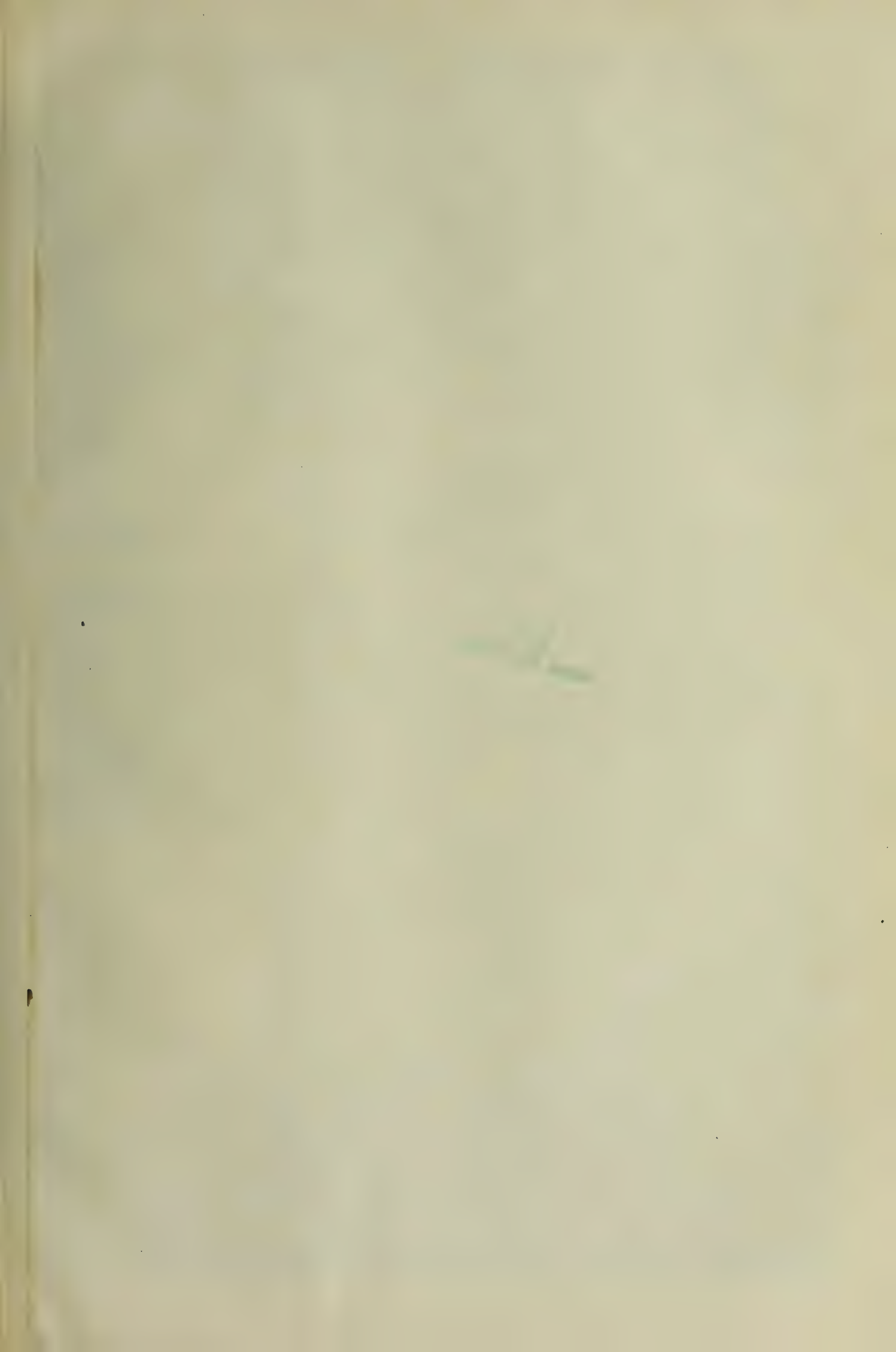




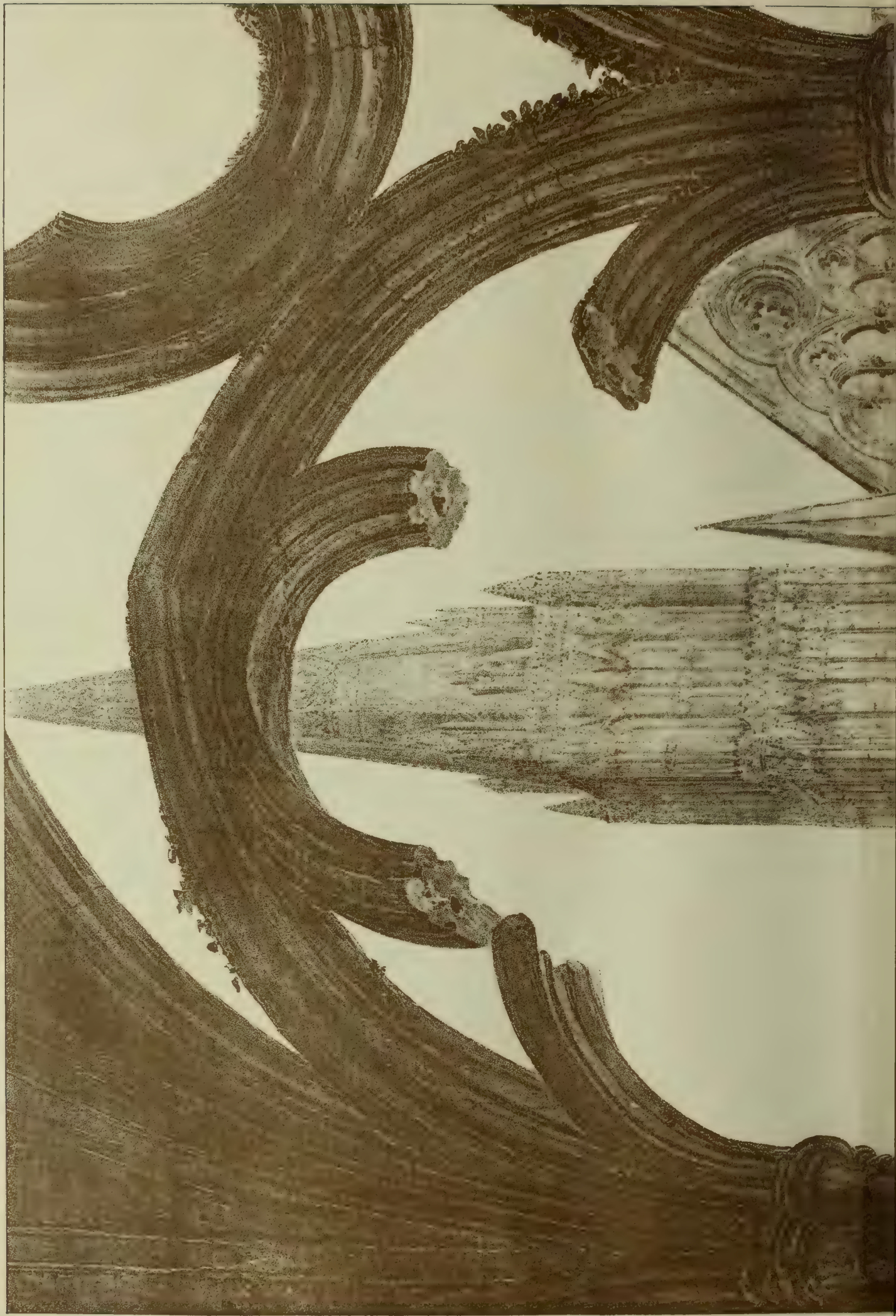
— NEW QUARTERS FOR THE BOTANICAL AND AFFORESTATION DEPARTMENT — HONG KONG

Messrs. DENISON & RAM ARCHT  
HONG KONG











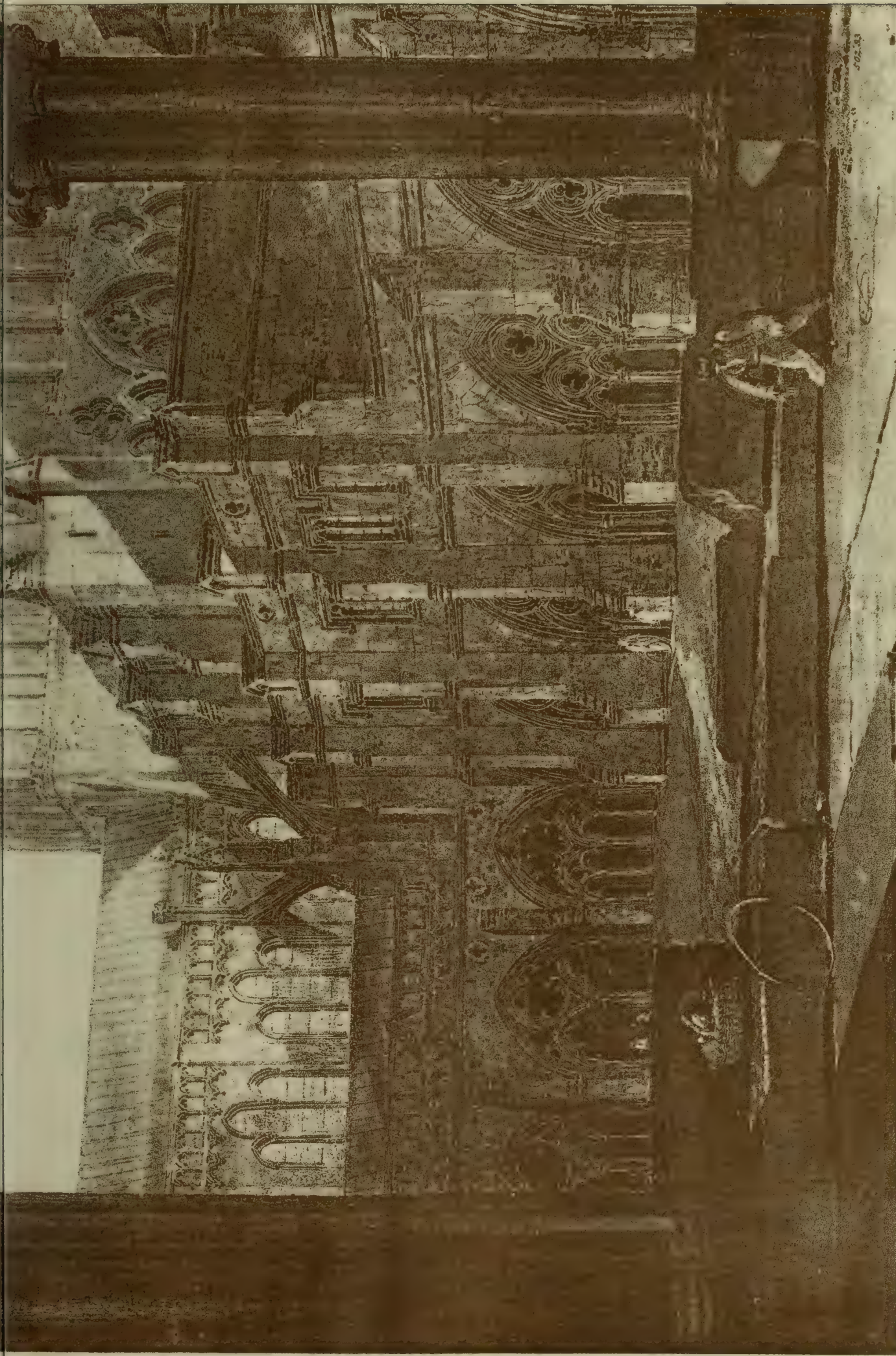


PHOTO-TINT BY J. M. W. TURNER. QUEEN'S SQUARE, LONDON, W.

VIEW OF THE CLOISTERS SALISBURY CATHEDRAL BY J. M. W. TURNER



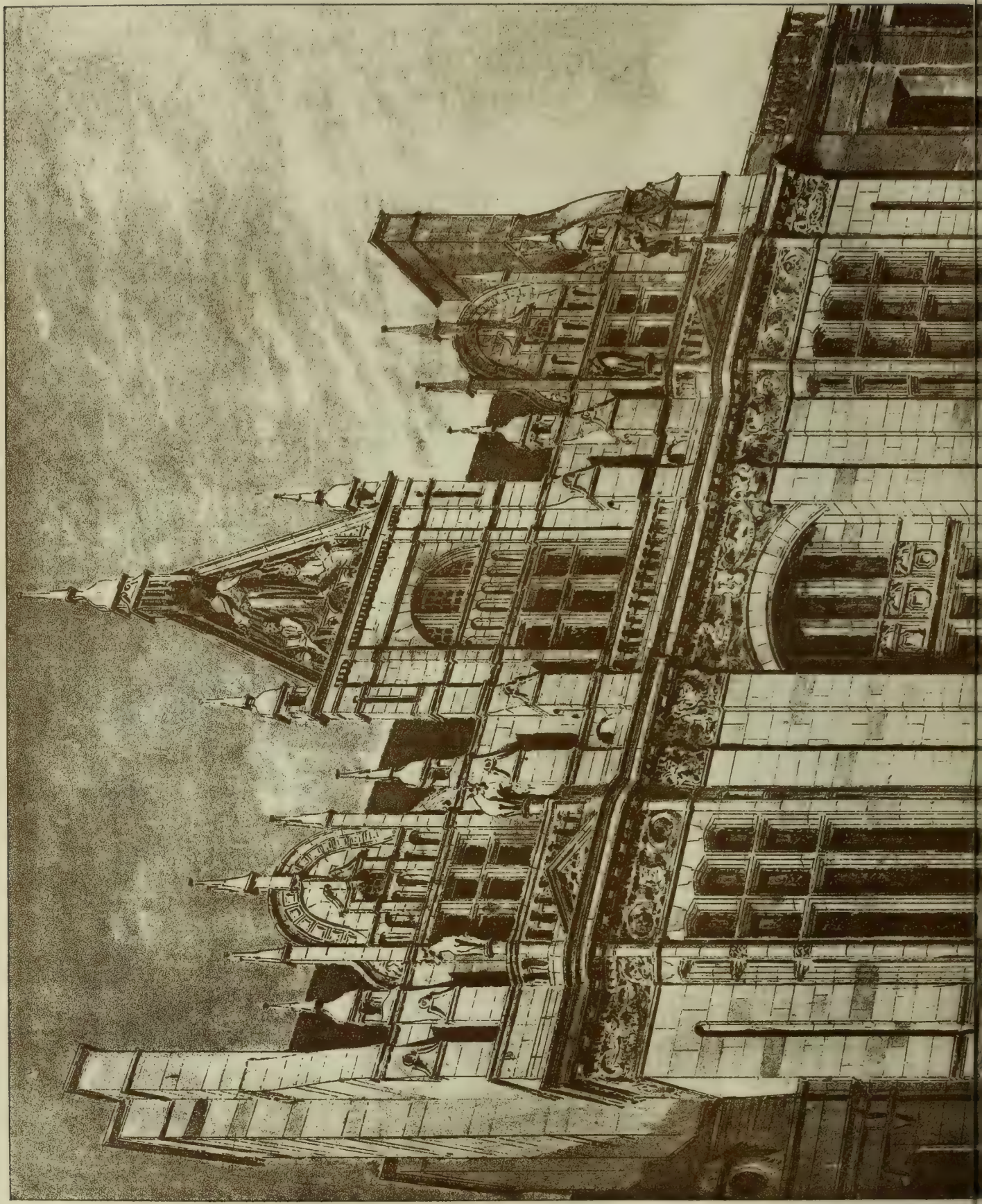








THE BUILDING NEWS, JUNE 11, 1897.







Charles E. Deacon del.

1897

"Photo-Tint" by James Akerman 6, Queen Square London W.C.

LIVERPOOL SCHOOL BOARD OFFICES CHAS E DEACON ARCHT

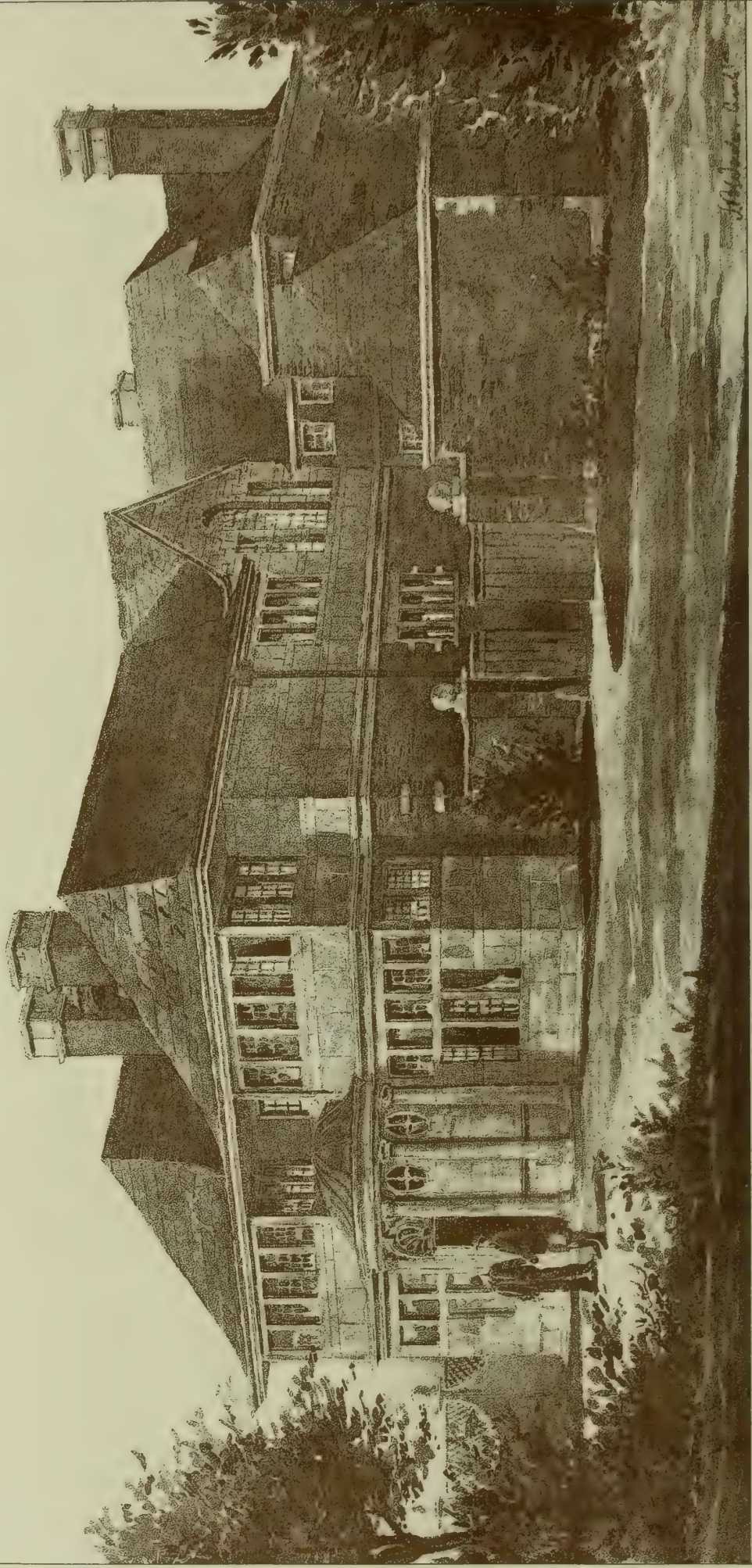




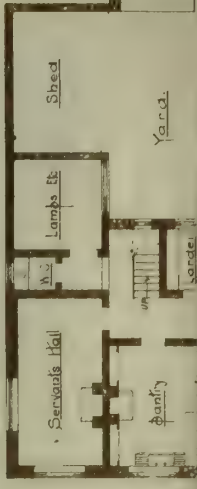
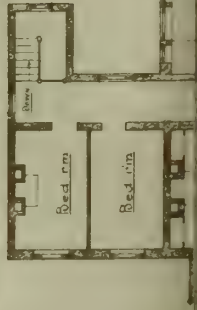




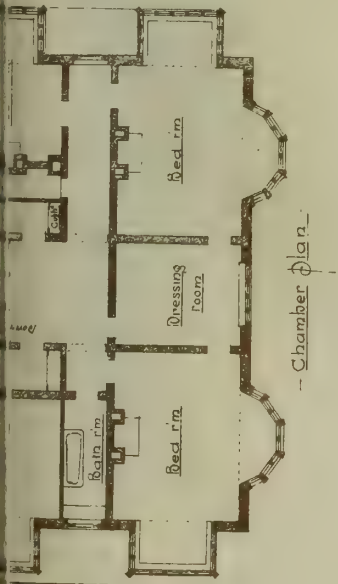




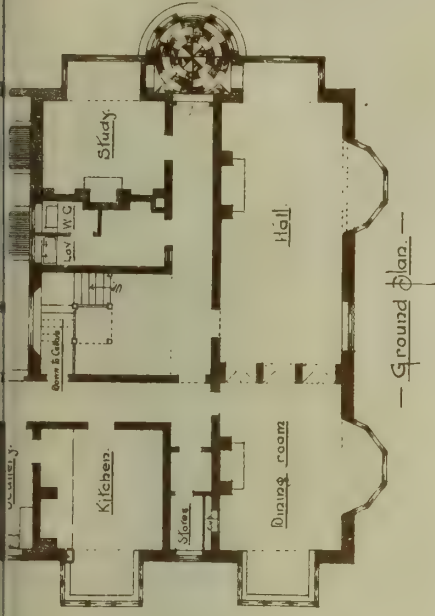
HOUSE FOR CAPT YOUNG AT WINCHFIELD HANTS FAIRFAX B WADE ARCHT



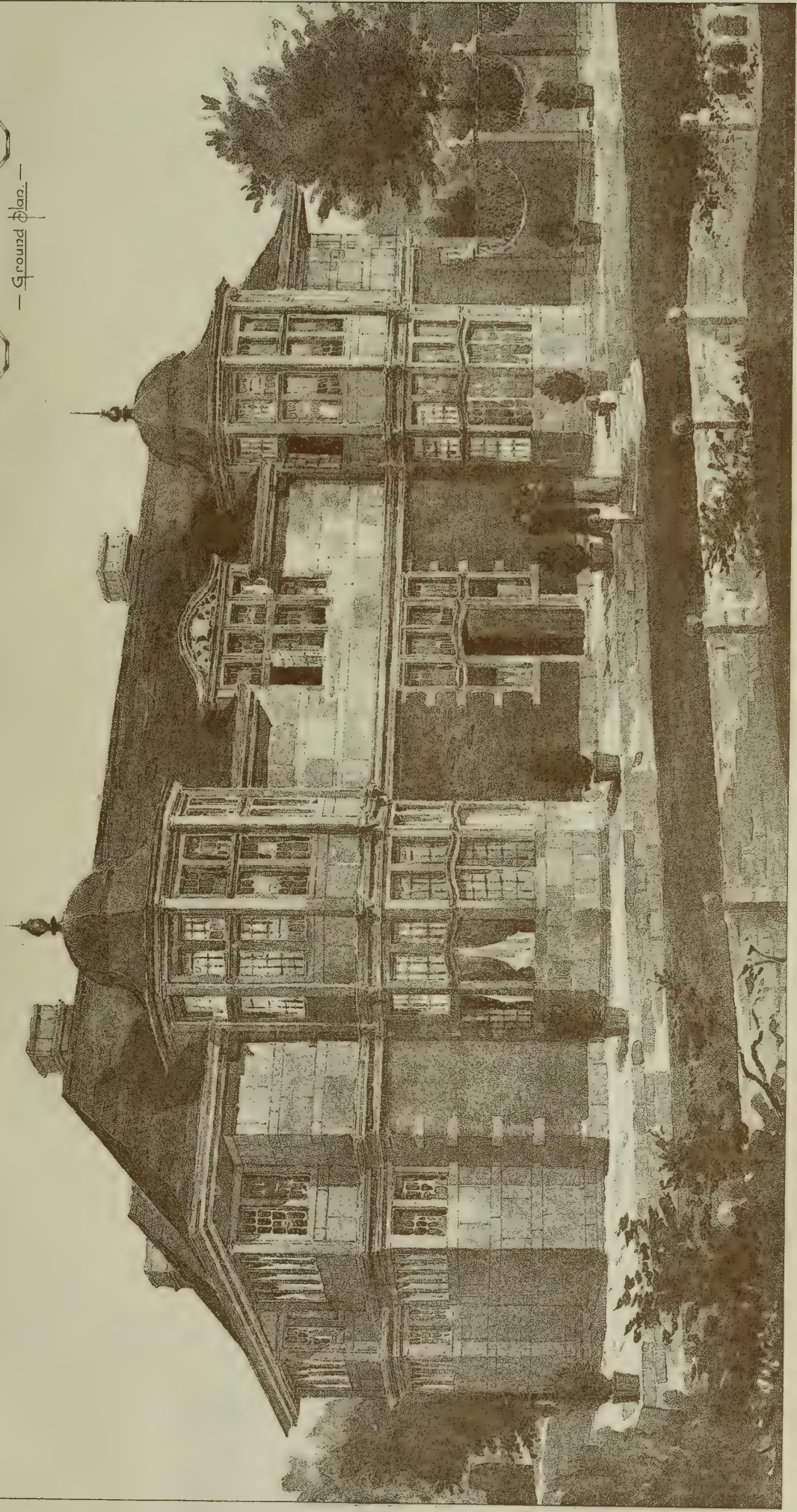




— Chamber plan —



— Ground plan —









**St Saviour's Homes,  
Hendon.**  
*H. H. Poole & Co. H. Phillott, M.R.*

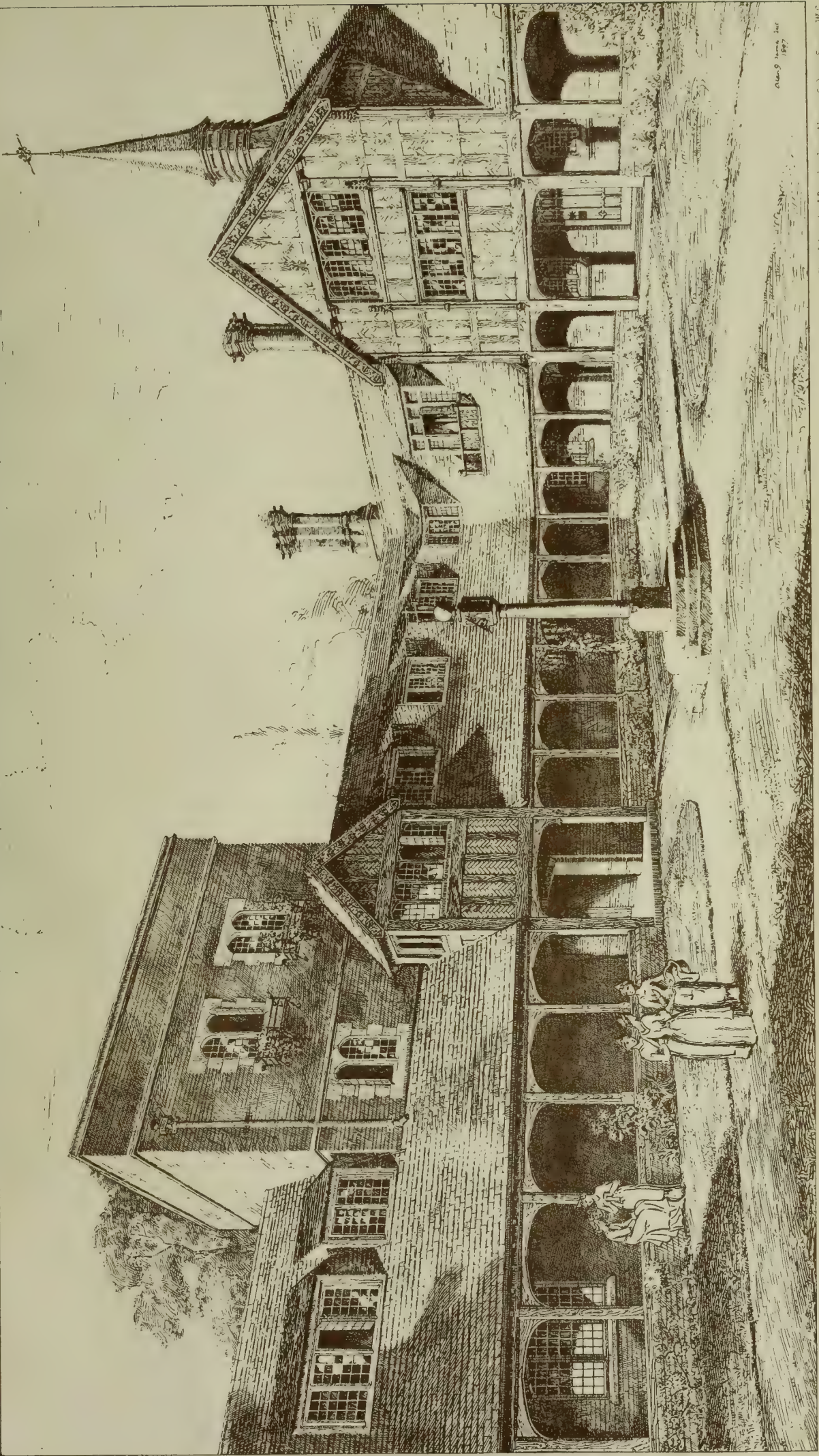


Photo Lithographed & Printed by Messrs. Alderman 6, Queen Square, W.C.

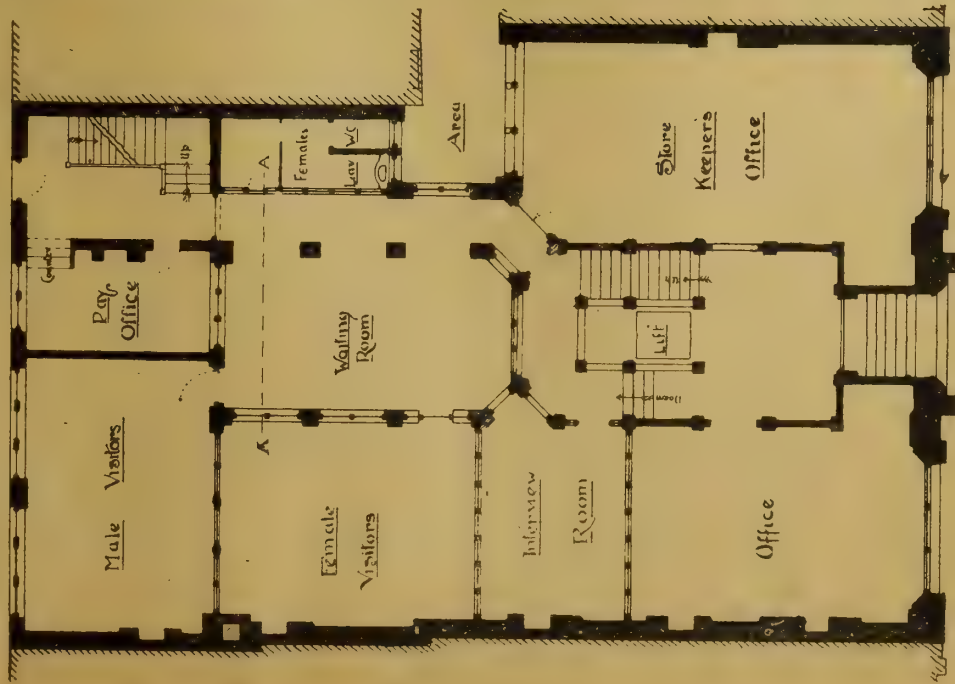






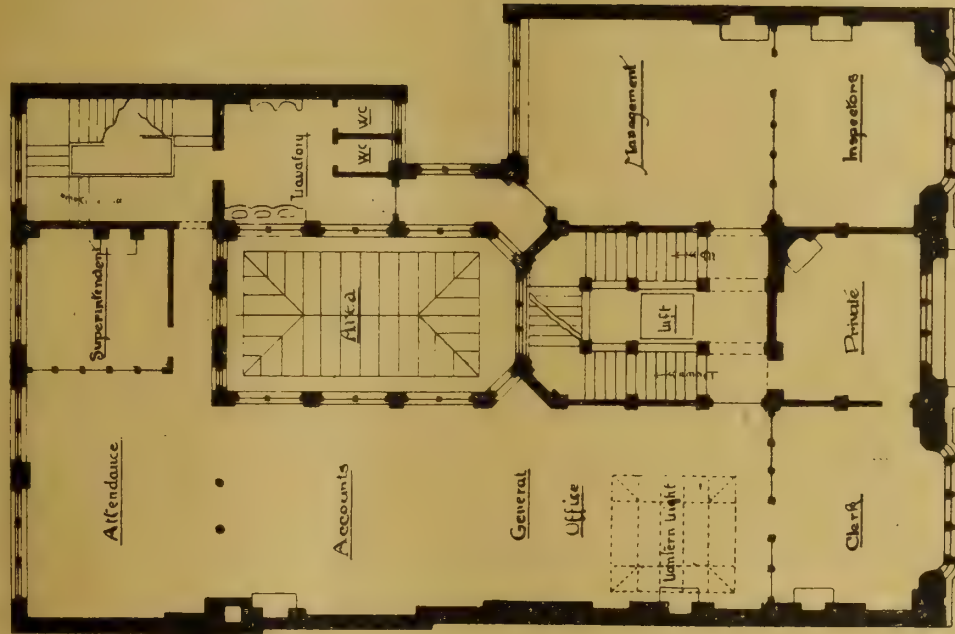
CHAS E DEACON ARCHT

LIVERPOOL SCHOOL-BOARD OFFICES



Ground Floor

21A THOMAS ST



First Floor Plan



Second Floor Plan





## NOTES FROM PARIS.

THE twenty-seventh annual meeting of the National Congress of French Architects is organised this year by the Société Centrale des Architectes and the Société Régionale des Architectes du Nord, and will be held from June 18 to 26 at Lille, Brussels, Antwerp, and Paris. The various sittings of the congress will be devoted to the study and discussion of the responsibilities of architects, the regional schools and the teaching of architecture in the provinces, the military service of architects, the question of the diploma, and the reforms to be made in each region with regard to the position of architects. The above questions will be discussed at Lille from June 18 to 22, and the various prizes and awards of the Société du Nord will be distributed; excursions will be made to Lombersart, Roubaix, Tourcoing, Templeuve, and Tournai, as well as to Brussels and Antwerp, where the congress will be received by the Société des Architectes de Belgique, and the Société des Architectes d'Anvers. The awards of the Société Centrale will be distributed at Paris on June the 26th, and will be followed by the traditional banquet.

The admission of women students to the lectures and studios of the Ecole des Beaux Arts of Paris has lately been decided upon by the Director of Fine Arts, and approved by Parliament and the Minister of Fine Arts, to whom an extra credit of £520 has been allowed to supplement the funds necessary for this new measure. Young girls and women, from the ages of 15 to 30 years, possessed of a certificate from any well-known artist, stating that the holder is sufficiently prepared to undergo the examination of admission to the Ecole, are now permitted to study in the galleries and the library, and follow the lectures and lessons of drawing, modelling, &c. At present the female students will not be obliged to pass the examinations of admission which are obligatory to male candidates; but, as soon as the proportion of female students becomes important and sufficient to fill the amphitheatres, these entrance examinations will be made obligatory, and it will be only after passing these examinations that the female student will be allowed to compete in the various school competitions and receive the medals and awards. This measure, making the Ecole accessible to women, will not result in lowering the standard of studies, or give too great facilities to the entrance of a career which many might afterwards find difficult to follow up; and the State, whilst approving of the measure, does not take any responsibility, in the case it should result in the production of false vocations, advising that the admission to the Ecole should be refused to all those whose primary education is deemed incomplete. This decision is by no means relished by the male students, who have already protested in their usual noisy manner against the admission of women, in whom they see future serious competitors in professions already too overcrowded.

All will have learned with regret the recent death, at the age of 50 years, of M. Paul Blondel, architect to the palaces of the Louvre and Tuileries. M. Blondel was pupil of M. Daumet at the Ecole des Beaux Arts, whose studio he entered at the age of 17; he twice carried off the medals of the second class of the Ecole, and was awarded the Deschaumes prize, rising into the first class, where he obtained ten medals, and carried off the prizes in the difficult competitions of Rougevin, Blouet, and Leclère, and also the Grand Prix of 1876, which latter allowed him to study for four years at the Villa Medici at Rome. He became inspector of civic buildings and architect of the Cour de Cassation, and on the death of M. Edmond Gillaume was appointed architect to the Louvre and Tuileries, where he prepared the transformation of the old Salle des Etats into a museum. The private and public buildings erected by the late architect are very numerous and well known; he was a member of the Société des Artistes and of the Société Centrale, and was also a Chevalier of the Légion d'Honneur.

A very important and salutary sanitary measure has been passed by the Conseil d'Hygiène de la Seine regarding the work of demolishing and excavations necessary for important operations, such as the piercing of the new Rue Réaumur, based on the report of M. Bunel, architect to the Prefecture of Police, supported by the views of many doctors and others, who are of opinion that such work is exceedingly dangerous to the public health and the direct cause of infectious epidemics; and this is not difficult to understand if the Rue Réaumur may be taken as an example, for the pulling-down of the old premises, left in a state of horrible filthiness

by the expropriated inhabitants, and the excavations for the new buildings made in ground for many years polluted by defective drainage and overflowing cesspools, would, by the scattering and upturning of disease germs long buried in the walls and ground, certainly engender dangerous epidemics in the surrounding neighbourhood if effective preventive measures were not enforced. The rules now to be rigorously imposed on all contractors for demolitions and excavations comprise six paragraphs, too long to cite here, but which may be summed up in the two principal rules, as follows: 1. In the execution of all work of excavations for foundations, levelling of the ground, excavations for drains and new buildings, &c., if the earth extracted or upturned is found to be infected or soiled, and in consequence capable of seriously compromising the public health and of engendering endemic, epidemic, or contagious diseases, the excavations and upturned earth shall at each interruption of the work be sprinkled with pulverised sulphate of iron mixed with unslaked lime in the proportion of 100 grammes of sulphate of iron and 200 grammes of lime for each superficial mètre, equalling about 3½ oz. of sulphate of iron and 7 oz. of lime to each superficial yard. The earth coming from these excavations shall be sprinkled and mixed with the same substances in the proportion of 500 grammes of sulphate of iron and 1 kilo. of unslaked lime for each cubic mètre, or about 1 lb. of iron and 2 lb. of lime to every 35c.ft. of earth. 2. This earth may be discharged on the public discharging places only outside Paris, and, in the special case of earth infected by the leakage of drains or cesspools, &c., it may be carried away only in covered carts, which do not allow the earth to fall on the streets on its way to the discharging places.

The interesting exhibition of Ceramic work and all the *arts du feu* now being held in the Palais des Beaux Arts, at the Champs de Mars, was inaugurated on the 17th inst. by the President of the Republic. This exhibition, of which we may speak in further notes, is certainly a most interesting manifestation of art. In the section of retrospective work of French art are to be seen some magnificent examples of Palissy, of First Empire Sèvres, of Moustier and Rouen, and in the retrospective foreign section are grouped the porcelain of China and Japan and objects of Persian and Italian fabrication. The manufactory of Sèvres exhibits some biscuit ware of marvellous finish, some magnificent *gres flammés*, several specimens of soft porcelain, and some examples of ware for constructional purposes; there are also several very fine specimens of decorative architecture, which will be noted later on.

The scheme of constructing the temporary Palais des Beaux Arts, destined to hold the annual "salons" and exhibitions of art until 1900 in the grounds of the Palais Royal will, owing to various objections, be probably put aside in favour of the proposal to erect this building in the Cour du Louvre behind the Gambetta monument, and M. Janty, architect, inspector of buildings belonging to the State, has been commissioned by the Minister of Fine Arts to prepare plans and designs for submitting. The building will be only one story high, and therefore will not hide the fine architecture of the Louvre. The surface destined for works of painting and engraving will be 20,000 superficial yards, with 2,700 yards run of "cimaise"; the sculpture will occupy 3,000 superficial yards, and the gardens, occupying 7,000 superficial yards, will be reserved for bronze and marble sculpture. The building will be constructed of wood, but all danger from fire will be avoided by covering the wood with plaster, and by an ingenious arrangement of construction the slight walls may, in the case of fire, be pushed outwards, and thus allow ample means of egress. The work is estimated at £25,000, and the aspect of this temporary construction is sufficiently elegant according to the sketches of M. Janty.

The Comtesse de Castellane née Gould, daughter of the American millionaire, has given the sum of £40,000 for the purpose of constructing a substantial building for holding charity sales, concerts, &c., and such meetings as were held in the Bazaar de la Charité of the Rue Jean Goujon, devastated by the terrible fire of May 4. A competition amongst architects will in all probability be opened, and it is expected that the rivalry and zeal of the competing architects will produce brilliant ideas in the planning and designing of a Palais de la Charité.

The vote for the medals of honour of the Société des Artistes Français at the Salon of the Champs Elysées took place on the 20th inst. The

medal for the section of Painting was keenly disputed by the candidates MM. Harpignies, Humbert, Henner, Henri-Martin, Guillemet, Gervais, Bussan, and Tattergrain, but was at length awarded by a very large majority to M. Harpignies, who exhibits this year two landscapes, called "Solitude" and "The Banks of the Rhone." In the section of Sculpture the voting was divided in favour of MM. Mathurin Moreau, Carlier, Verlet, and Captier, the decision being the award of the medal of honour to M. Mathurin Moreau, who exhibits a marble group, the Couronnement du Monument de Joigneaux. In Architecture the votes were first divided between MM. Pontremoli, Marcel, Chancel, and Marcel and Blanc, but, neither of the candidates having obtained the majority necessary for the medal of honour, this was not awarded. M. Marcel, in whose favour the majority was nearly obtained, protested that the medal of honour was due to him, as several of the votes were placed in favour of his name combined with that of M. Blanc, for a work in which both had contributed. The matter will be brought before the Société des Artistes Français for its decision. In Engraving the medal of honour was awarded to M. Achille Sirouy, who exhibits the portrait of M. Vigneron, after the painting of M. Roybet. The jury of the section of Decorative Art awarded the following medals: First medal to MM. Theodore-Rivière and Zalique, and second medal to M. Engrand.

M. Henri Harpignies, the winner of the medal of honour in Painting, made his débuts at the Salon in 1853, and has since that time regularly exhibited, and continues to exhibit, despite his 78 years, a number of landscapes, mostly historical, always varied and full of remarkable qualities of atmosphere, effect of perspective, and clearness of horizon. M. Harpignies carried off medals at the Salons of 1856, 1867, and 1869, and a silver medal at the Exposition of 1878; chevalier of the Légion d'Honneur in 1875, he was promoted to the title of officer in 1883.

The first medals in the sections of Painting and Sculpture were awarded to MM. Paul Albert Laurens and Sicard respectively.

## CHIPS.

The town council of Newcastle-under-Lyme have decided to enlarge the cemetery at an estimated cost of £3,800.

The residents of Torquay are raising considerable opposition to the proposal of a syndicate to construct an electric tram line along the sea front to Paignton. It is alleged that the line would ruin the natural beauties of Torbay-road.

The foundation stones of a new Sunday-school for the Church of Christ, Above Bar, Southampton, were laid on Wednesday week. The building, which will be situate at the rear of the church, with entrance in Ogle-street, will have a length of 60ft., and a breadth of 35ft., and is to be of two stories, the ground floor being intended for a large school-room, the first floor being divided into class-rooms. The builders are Messrs. Knight and Sons, of Southampton.

Lauderdale House, Aldersgate-street, is about to be demolished to make way for a block of modern offices. This is the last survivor of the old houses for which Aldersgate-street was once famous.

Estate duty has been paid on £624,350 4s. 6d. as the value of the personal estate—the value of the real estate, if any, not being disclosed—of Mr. Francis William Crossley, of Star Hall, Alncoats, Manchester, engineer, and of Crossley Brothers (Limited), manufacturers of the Otto gas-engine, who died on the 25th of March last, aged 57 years.

At the Auction Mart on Wednesday the Barton-house Estate, South Warwickshire, comprising an original Jacobean mansion, built by Inigo Jones in the year 1615 for Sir James Overbury, with its estate of about 750 acres, was sold for £27,200, including the valuable timber.

The John Robinson memorial church at Gainsborough, the foundation-stone of which was laid last year by Mr. Bayard, then Ambassador of the United States, was opened on Wednesday. The cost has been £7,000, £4,000 of which has been raised. The church accommodates 600 persons, and has a school, hall, church parlour, and vestry. It is designed as a memorial to John Robinson, of Gainsborough, pastor of Leyden Church, originally founded in Gainsborough, and the originator of American Congregationalism.

Mr. George Chester, a landscape painter, whose name was familiar to the last generation, died on Friday at Hastings, aged 83 years. According to Graves's "Dictionary of Artists," he exhibited 37 pictures at the Royal Academy between 1846 and 1892.



## Building Intelligence.

**NEW BRIGHTON.**—The tower grounds and the tower itself were opened to the public on Whit Monday. The latter has only as yet been carried to about a quarter of its intended height, viz., 150ft. out of 600ft.; but the portion constructed already forms the dominating feature in the scenery at the mouth of the Mersey, and its massive proportions may be seen for miles around. With £300,000 at its back, the company which is constructing the tower is proceeding with the work in no niggardly fashion. Since the original site was purchased further plots of the well-wooded adjoining land have been secured, and the grounds now cover an area of over 25 acres. Under the energetic superintendence of Messrs. Maxwell and Tuke, the architects, the work is being pushed on with rapidity. The tower has reached the second story, and will soon be available both for dancing and theatrical and circus performances. The basement will be utilised as a theatre or circus, capable of seating 3,000 people, and on the first stage, above the circus, will be placed the great ballroom, in which space will be found for 4,000 dancers. The roof of the ballroom will be formed into a promenade garden. A large pond which stood in the grounds has been enlarged and deepened, and now forms a miniature lake, and running into it there has been constructed a water chute. An open air dancing platform has also been constructed, with an area of 14,000sq. ft., and a switchback railway has been built in the grounds.

**SMETHWICK.**—A new Wesleyan church in Waterloo and Sycamore-roads was opened on Thursday in last week. It is in Early English style, and is constructed of brickwork with stone dressings, the interior walls being finished with plaster (coloured a neutral tint) and stone, the window reveals being finished with parian cement, and the roofs covered with red tiles. The plan of the church consists of nave, with lean-to aisles and chancel. The church is about 90ft. in length, 45ft. in width (inclusive of aisles), and 31ft. high. The seating accommodation is for about 650 persons. Above the arcading are arranged clerestory windows, while over the gallery are arranged two three-light windows. The builders were Messrs. J. Harley and Son, of Rolfe-street, Smethwick; and the architects are Messrs. Ewen and J. Alfred Harper, of Colmore-row, Birmingham. The cost has been about £3,500.

The New Tyne Bridge Special Committee have reported to the Newcastle Corporation relative to the proposed new bridge over the Tyne, recommending (1) that a bridge be erected across the river by the corporations of Newcastle and Gateshead; (2) that the bridge be of sufficient width and strength to carry two lines of tramways; (3) that the bridge be constructed from Pilgrim-street, Newcastle, to High-street, Gateshead; (4) that a sum not exceeding £400 be expended by the two corporations in obtaining the opinion of an expert engineer on the scheme. The report stands over for consideration.

At a meeting of the Bury (Lancs) Town Council on Friday, a resolution was passed adopting the provisions of the Public Libraries Act and Public Libraries Amendment Act, the resolution to come into operation one month after the publication of the necessary notices. The library will form a portion of the Art Gallery and Library scheme by which the Queen's long reign is to be locally celebrated. Mr. Kenyon, M.P., has offered £1,000 towards the purchase of pictures.

The colossal group representing the Triumph of the Republic, by the sculptor Dalou, which was exhibited at the Salon in 1885, is at last to be sent to a foundry to be cast in bronze. An attempt to cast the group by the ceroplastic process, made a few years ago, cost £2,800, and proved an utter failure. The cost of casting it in bronze is estimated at £10,000, and as the group itself cost £4,800, the City of Paris will have spent nearly £18,000 by the time the "Triumph" is finally set up in the Place du Trône, for which it is destined.

At the Knaresborough County-court on Friday, Messrs. Wm. Sissons and Co., timber merchants, of Hull, sued W. Sykes, of Harrogate, builder, to recover £13, the value of sixteen doors supplied. The defence set up was that a contract was entered into that the doors were to be supplied within fourteen days, and the contract being broken, the defendant had no use for the doors. His Honour (Deputy Judge R. E. Turton) upheld the contention that there was a time contract, and gave a verdict for the defendant with costs.

## Engineering Notes.

**TRAFFORD PARK RAILWAY.**—The new estate railway running through Trafford Park, from the Royal Show main entrance to Barton Lodge, was inspected on Friday by representatives of the Manchester Ship Canal Company and of the Trafford Park Estates, Limited. The railway is directly connected with the railway system of the Ship Canal, and through the canal system with all the other railways in the district. The new line will serve for the conveyance of merchandise in ordinary railway waggons to and from works upon the Trafford Park Estate and the Manchester docks as well as with all parts of the kingdom. In addition to its use as an ordinary railway, gas traction tramcars, wheeled to the ordinary railway gauge, will convey passengers to and from Barton, for which purpose it will be formally opened on Friday in next week, the 18th inst. The time taken in collecting the materials and constructing the line (which is 3½ miles in length) has been less than one month, and is a time record in the construction of permanent way in this country. Mr. Ellis was the engineer, and Messrs. Nuttall were the contractors.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**THE EDINBURGH ARCHITECTURAL ASSOCIATION.**—On Saturday this Association visited Torpichen Church, the chief centre of the Knights of St. John in Scotland. Mr. Henry F. Kerr, A.R.I.B.A., who conducted the party, explained, in the course of his remarks, that the Hospital of the Knight was probably founded in 1153, when the order was introduced into Scotland. An old archway occupying a site under the westernmost arch of the crossing was probably the chancel arch of the first church. The rest of the Mediaeval remains were of Late Pointed work, consisting of north and south transepts, with at the crossing a tower, which must originally have been a bold feature, with its cape house gathered with crow steps. The vaulting of the transepts and crossing were still standing, but in some places the vaulting ribs were badly split, and some of the vaulting stones had fallen out. On the motion of Mr. Thomas Ross, F.S.A., a vote of thanks was given to Mr. Kerr and the Rev. John M. Johnstone, the incumbent of the church.

## CHIPS.

Cornell University has established in its architectural department a new chair, that of architectural design, and has offered it to Mr. Van Pelt, who has accepted it, and will begin his duties next autumn. Mr. Van Pelt is one of the American students of architecture at the Paris School of Fine Arts.

The mayor and town council of Berwick formally inaugurated on Tuesday the extension of the water-works at Tweedmouth, which have cost about £5,000. The engineers for the works were Messrs. Leslie and Reid, C.E., Edinburgh.

It is stated that the Government has notified the South Kensington Museum authorities that they are to refrain from making any purchases for the collections until the difficulty of storage room and the question of rebuilding have been settled.

Mr. P. Macgregor Chalmers, R.S.A., on Tuesday, in the presence of a distinguished company of archaeologists, gave a lecture, with demonstrations, on the crypt of Glasgow Cathedral, in which he refuted some of the views which have been expressed regarding this portion of the ancient building. The crypt was specially lighted for the occasion.

An important amendment to the building laws has just passed the Massachusetts Legislature, by which it is required that all hotels, schoolhouses, and tenement houses hereafter erected within the fire limits of Boston shall be "first-class buildings," that is, of incombustible materials throughout.

The vicar of Colebrooke, Devon, while digging in his garden last week, delved around a grey granite stone that appeared a few inches above ground, and found that it was the base of the long-lost preaching-cross, which formerly stood in the parish churchyard. It has been decided to restore and re-erect the cross.

Christ Church, the oldest church in Georgia, where John Wesley preached, has been burned almost to the ground. Christ Church parish was founded soon after the settlement of Savannah. The edifice was begun in 1743, but was not completed until 1750.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

\* In response to complaints from readers that they are unable to get the BUILDING NEWS at Messrs. W. H. Smith and Son's bookstalls, we can only suggest that they should order the paper of some other newsagent. Messrs. W. H. Smith and Son recently requested us to allow them an extra discount beyond that allowed to the general trade, and because we declined they have ceased to send the paper out to their bookstalls. We have, of course, no remedy; but we do not think the demand was a fair one.

RECEIVED.—H. H.—W. Sparrow.—C. E. F.—F. D. G.—E. N. and Co.—S. M. (Bristol).—C. G. P.—J. N.

## Correspondence.

### R.I.B.A. ELECTION OF FELLOWS.

To the Editor of the BUILDING NEWS.

SIR,—Kindly allow me to remind members of the R.I.B.A. that the adjourned discussion on the election of Fellows follows the ordinary business on Monday next, and that it is most desirable that all those taking exception to any of the proposals should attend.—I am, &c.,

H. V. LANCHESTER,

Hon. Sec. Associates' Committee.

12, Great James-street, Bedford-row,  
London, W.C., June 8.

At Cambridge, on Friday, the Mayor opened a new branch of the Public Free Library, situated in Mill-road, with a population of 12,000 persons within a radius of half a mile of the building. The Free Library, which was opened in 1853, has proved to be a very popular institution.

The Hanley, Stoke, and Fenton Joint Hospital Board having applied to the Local Government Board for sanction to borrow the sum of £6,500 for addition to their infectious diseases hospital at Bucknall, Dr. G. S. Buchanan, one of the Local Government Board inspectors, held an inquiry concerning the matter at the Town-hall, Hanley, on Friday. It was explained that a tender amounting to £5,170 had been accepted from Mr. John Bayrall for the erection of the additional buildings.



## Intercommunication.

### QUESTIONS.

[11677].—**Cycle Track.**—Will anyone be good enough to give me a short specification of a first-class cycle track (say for six laps to the mile), and the foundation?—ARCHIBALD.

[11678].—**Carved Wood Moulds.**—Could any of your readers tell me where I could obtain good carved wood moulds, to take some deep impressions from, so as to bring the subjects out in bold relief in a similar manner to gelatine or plaster moulds?—R.

[11679].—**Red Letters on Stone.**—Is there any red cement composition which could be used for the filling of letters cut into stone or slate, whereby the appearance of red letters on a stone or slate ground could be obtained, and which would stand the weather?—W. E. V. C.

[11680].—**Contract Signing.**—When a partner or manager signs for a firm, is it sufficient if the name of the firm is written only, or should that of the party signing be added, in case of any question being raised afterwards?—DOUBTFUL.

[11681].—**Office Correspondence.**—I shall be glad to hear of a good system of keeping letters for easy reference, removal, and replacement. Letters written with a margin thereto I find much easier of attachment and reference than those crammed with writing to the edges of paper, as though letter-paper and postage were expensive.—SYSTEMATIC.

[11682].—**Architects' Book-keeping.**—Is there a book published on book-keeping adaptable to an architect and surveyor's special requirements? If so, I shall be pleased to hear by whom issued, and the price.—A. B. C.

[11683].—**Elliptic Arch.**—I know of several ways of drawing and setting-out a half-true ellipse; but will any reader kindly give me an explanation of the method of striking out the same approximately with pencil-point compasses from three centres—i.e., one centre in a line extended downwards from the half-short diameter, and two side centres near the ends of the long diameter? The approximate half-ellipse so struck will be two short equal arcs, one at each end, joined by a longer arc of longer diameter. I have a rule for this with five centres (i.e., one middle and two pairs of side centres), but it is too complicated for workmen's use. What I want is a rule which will hold good for any half-ellipse divided by the longer diameter, with any given proportion between the long diameter and the short half-diameter. In fact, to strike the half-approximate ellipse within any given oblong touching the two bottom angles and the middle of the top line, one long side of the oblong forming its base.—J. W. S.

[11684].—**Cottage Hospital Ventilation.**—I have lately carried out the erection of a small cottage hospital, the outlet ventilation of which is by air-tight shafts from openings in the ceiling leading to a large air-pump ventilator on the summit of the roof. I am informed that these outlet vent-shafts are undesirable in connection with a hospital, as disease germs are drawn into them, remain there, and accumulate. I shall be very glad to have the opinion of any of your readers on this matter, and also to learn if there is any better method of extracting the vitiated air from a small hospital or sick-room.—C. R. D.

[11685].—**A "Hundred" of Lime.**—This is an old measure. Is it now obsolete, or is it still in use in some parts of the country, and, if so, where? It is, I believe, based on 100 pecks. If so, is it now 100 imperial pecks (i.e.,  $\frac{1}{4}$ th imperial bushel), or is it as a surviving old measure, 100 Winchester pecks (i.e., 25 Winchester bushels)? A Winchester bushel struck was 2150 $\frac{1}{4}$ 5c.in. The newer imperial bushel 2218 $\frac{1}{4}$ 192c.in. when struck. A table-book Mackenzie published circa 1856 gives 100 of lime as 100 pecks, and 200 of lime as 57 $\frac{1}{2}$ c.ft. nearly. Tarn's "Students' Guide" (page 32, edit. 1871) gives 100 as 35 bushels. Both the latter quantities appear to me to be wrong. What 57 $\frac{1}{2}$ c.ft. should be altered to I do not know; but would suggest that Tarn's 35 bushels is a misprint for 25, but which—Winchester bushels or imperial bushels? I shall be obliged if any reader can assist me. Mackenzie's tables above referred to also give 200 of lime 57 $\frac{1}{2}$ c.ft. as also equal to a chaldron; but although there are different chaldrons, both locally and for different kinds of goods, I know of none of that capacity—e.g., there is the coke chaldron of London district, 36 heaped imperial bushels, and the dry measure of the usual tables, 32 struck bushels, others at Newcastle, U.S. America, and a local one at New York, U.S.A.—R. W.

[11686].—**Domestic Hot-Water Supply.**—Many hot-water cylinders have the blow-off pipe of less bore than the flow and return pipes from boiler. Is not this a mistake, and ought not the steam escape-pipe to be at least of the same diameter, or even larger, than the circulating pipes, so as to prevent pressure in cylinder and boiler?—TOLDO.

### REPLIES.

[11671].—**Polishing Marble Carving.**—As a question of art, it is better, certainly, to leave any carved ornament as it comes from the chisel of the carver, unpolished. There may be exceptional circumstances which would suggest polishing, as when the same tone is desired; but to polish the work of a carver would be in some cases to destroy the sharpness of the ornament, and obliterate those fine markings of the tool which give expression and vigour to the sculptor's work. Such work had far better be simply oiled.—G. H. G.

[11672].—**Architect's Custom.**—The contractors may arrange with the architect that the sum to be paid merchant or other person should be deducted from final certificate. Any order given by a contractor to a merchant for a certain sum to be paid out of certificate is not a point that would concern the architect in the ordinary course.—H.

[11674].—**Road Bridges.**—Several books on iron bridges are published, such as "Iron Bridges of Moderate Span," by H. W. Pendred (Lockwood and Son); Hum-

ber's "Iron Bridge Construction," the same publisher; Campin's "Constructional Ironwork," &c.—A READER.

[11675].—**Aisle Roofs.**—A slope of 30° is flat. I should be inclined to retille the roof with an interlocked tile, such as Messrs. Doulton make. A tile of this sort need not be a solid slab, and therefore apt to crack. The old tiles might be rendered waterproof by a coating or two of Szezelmey's stone liquid, which does not change the colour of the tiles. Brick walls in very exposed situations have been treated with it, and have been since quite dry. The liquid has been used with success for waterproofing porous tiles. Write for particulars to N. C. Szezelmey and Co., Rotherhithe New-road, London.—G. H. G.

[11675].—**Aisle Roofs.**—"Lincoln" cannot do better than treat the porous tiles of the aisle roof with Szezelmey stone liquid. This preparation will render the tiles absolutely waterproof, and will not make any alteration in their colour, while the cost of application is small. The makers' address is Rotherhithe, New-road, London, S.E. Your correspondent might read the article on page 806, "The Cause and Cure of Damp Walls," which appeared in your issue of June 4.—A. C.

### CHIPS.

On Saturday the co-operators of Market Rasen laid the corner-stone of their new premises in Union-street. The architect is Mr. W. Mortimer, of Lincoln.

The Public Offices (Whitehall Site) Bill and the Patent Office Extension Bill passed through committee and were read a third time in the House of Commons on Friday night.

The Central London Railway Company have officially notified their withdrawal of the Bill deposited by them, for the present Session, for power to acquire certain lands on the north side of Oxford-street, and to alter the position of their station under Oxford-street, near Marylebone-lane.

On leaving Castle Howard for Naworth, Mr. James Laurie, who has been clerk of the works to the Earl of Carlisle at Castle Howard for fifteen years, was presented with a chiming timepiece from the employes and friends on Castle Howard estate.

The proposed new town-hall came up for discussion at the meeting of the Peterborough City Council in committee on Friday evening, when it was proposed "that steps should be taken to erect a new town-hall on the Market-place site. It was finally agreed by nine to seven votes that the surveyor should prepare a ground plan of a new hall in the Market-place and submit it to the next meeting of the council.

At St. Augustine's Church, Highbury New Park, on the 2nd inst., Mr. Alfred Henry Hart, A.R.I.B.A., of 9, Staple-inn, Holborn, the newly-elected vice-president and late hon. secretary of the Architectural Association, was married to Ethel Adeline, only daughter of the late Mr. J. Johnson Mills, of Port Elizabeth and Heidelberg, S.A., and of Mrs. Henry Bailey, 40, Highbury-grove, N.

Mr. William Morton, one of the best known water-colour painters in Lancashire, and also widely known as a book illustrator and engraver, died on Saturday at his residence, Patricroft, near Manchester, in his 72nd year.

A new gasholder, erected by the corporation of Kilmarnock, was formally inaugurated on Friday, the gas being turned on to the town by Provost Mackay. The holder is capable of containing 470,000c.ft. of gas, and the cost of it was £550.

The foundation-stone of a new electric lighting station for Southampton was laid by the mayor on Tuesday week, alongside the existing works, at the Back-of-the Walls. The buildings will consist of offices, engine-house, and boiler-house. Messrs. Playfair and Toole, of Southampton, are the contractors, and Messrs. Kincaid, Waller, and Manville, of Westminster, the engineers and architects. The outlay will be about £8,000.

A committee of the House of Commons sat on Friday to consider the East London Water Bill. This measure proposes to empower the company to raise £500,000 additional capital, the chief object being the construction of two new reservoirs at Tottenham Marshes of 1,015,000 gallons capacity in which to store water which at present in times of flood flows down the Lea to waste. The preamble of the Bill generally was passed.

Deptford Park was formally opened to the public on Whit Monday. The park, the principal entrance to which fronts the Deptford Lower-road, is of an area of 17 acres, and was purchased in February, 1893, having previously been let on lease as a market garden. The purchase price was £2,100 per acre, and the total cost was £36,031, towards which the London County Council contributed £24,031. The park has been laid out from the designs of Colonel J. J. Sexby, the chief officer of the Parks Department, at a cost of £7,500, and nothing has been planted which is not likely to thrive in the peculiar atmosphere of Deptford, the major portion of the ground being a grass area to be used as a playground.

## WATER SUPPLY AND SANITARY MATTERS.

**BATH WATERWORKS: THE NEW RESERVOIR.**—In the Monkswood Valley, about seven miles to the north-east of Bath, and on the borders of Gloucestershire and Somerset, the new reservoir constructed by the Bath Town Council was formally opened on Monday by the Mayor, who performed the ceremony of turning on the water from the reservoir into the mains leading to the city. The work, which has been three years in execution, renders the water supply of the city safe even in the driest summer and autumn. It is over nine acres in extent, and contains 51,000,000 gallons. To Mr. Charles Gilby, the city engineer of Bath, belongs the credit of pointing out to the waterworks committee the advantage of such a reservoir, when they favoured the acquisition of further springs without increasing the storage. Mr. W. Fox, of Westminster, has been the engineer, and Messrs. W. Neave and Son, of Paddington, the contractors. The reservoir has cost over £35,000, but more land has been purchased than was needed in the actual construction of the work. With slabs of concrete made from crushing stone found on the plateau above the valley, and cement, or with the native stone in its natural state, the interior of the reservoir is paved throughout its entire extent. No filtering beds are provided, but a straining well is constructed at the point of inlet.

### LEGAL INTELLIGENCE.

**THE DEVELOPMENT OF PLEASINGTON.**—At the Lancashire Chancery Court, Liverpool, on Wednesday last, before Vice-Chancellor Hall, the case of Wilding v. Bowdon and others was heard. It was an application for an injunction to restrain the defendants from building and sanctioning the building of a certain class of houses on an estate at Pleasington, near Blackburn. Mr. Staffurth appeared for the plaintiff; Mr. Firth for Mr. J. E. B. Bowdon, the owner of the estate; and Mr. Rotch for Francis Hutchinson and Colin Brothers, the intending builders of the house objected to. The plaintiff's case was that so far back as 1856 a building scheme, shown on a plan produced, was made by Mr. W. Hopwood, surveyor, of Blackburn, by which the land was laid out in plots for the erection of detached or semi-detached houses, and no trades were to be carried on, and that there was an implied contract embodying these conditions in certain leases, under which plaintiff acquired land from Bowdon, and proceeded to erect houses thereon. It was now proposed by the other defendants, presumably with Bowdon's consent, to erect a terrace of houses on adjoining land, and also four shops, and the plaintiff therefore asked that they should be restrained. The defence was that, so far as the four shops were concerned, they were to be on back land, and outside the area of the scheme, and that there was no operative restriction as to the number of houses which should be erected on a given area. After elaborate argument and reference to authorities, the Vice-Chancellor reserved his judgment to the 16th instant, in Manchester.

**IN RE HENRY SMITH, OF CARDIFF.**—The first meeting of the creditors of Henry Smith, builder and contractor, 7, Radnor-road, Cardiff, late 23, Arcot-street, Penarth, was held at Cardiff, on Thursday in last week. The statement of affairs presented showed the gross liabilities as £5,914 0s. 10d., of which sum £244 16s. 8d. is expected to rank for dividend. The assets amount to £233 15s. 10d., leaving a deficiency of £11 0s. 10d. The cause of failure was ascribed by debtor to be due to loss of capital in property at Barry Dock and Penarth. The meeting was adjourned in order to give debtor an opportunity of making an offer.

**THE LIABILITY OF TECHNICAL INSTRUCTION COMMITTEES.**—Judge Steavenson had before him at the Appleby County Court, on Saturday, a case in which Edward Shaw Robson, a science teacher, late of Sculby, Westmorland, and now of Bishop Auckland, sued the Kirkby Stephen Technical Instruction Committee for the sum of £12 10s., science and art grants earned by him, but not paid by the department, owing to the alleged failure of the secretary to forward certain returns. The committee maintained that they had complied with the requirements of the department, and furthermore that they had paid plaintiff an increased grant from the County Council funds to recoup him for the loss of the science and art grants. The judge, however, held that failure to carry out the contract made the committee liable, and gave a verdict for the plaintiff, but did not allow costs.

It is proposed to erect a bridge over the Forth at Cambuskenneth Abbey at a cost of £6,900.

The urban district council of Hurst have instructed Mr. Edward Garride, A.Mem.Inst.C.E., B.Sc., Ashton-under-Lyne, to prepare a scheme of main drainage for their district.



## Our Office Table.

At the National Gallery a miniature work, by Ludovico Mazzolino (1480 — 1528), entitled "Christ Disputing with the Doctors," has just been hung in Room V. The picture is a foot in length and 8½ in. in height, and is number 1495. It contains about thirty figures, the central one being that of our Saviour, seated on a bank, surrounded by groups of doctors, together with Joseph, the Virgin, and St. Anne.

In the vestibule of the north-west corner of the Italian Court at South Kensington Museum a model is being erected of the Paradiso of Isabella D'Este at Mantua, and is nearly completed. It was a special boudoir erected by the Duke in his Palace for her service. The upper portions of the walls are fitted with panel-pictures of allegorical subjects, the one as yet in place having for its subject the Expulsion of the Vices. When the details for the model were made, the opportunity was taken to copy the pictures, the originals having been removed in the past century to the Louvre in Paris. The South Kensington model will thus be the only means of realising to the full the artistic completeness of the beautiful room in its original aspect. Amongst recent purchases for the Museum are two samples of French woodwork from the Bonivaffe Collection, recently dispersed at the Salle des Ventes at Paris. The specimens are two painted and gilt wood columns of the Early French Renaissance, in which are retained some features of the Gothic period. They have been placed in the French furniture room. Another addition to the collections in these inflammable and ill-protected buildings is the carved oak mantelpiece from the house built by Thomas Bullen in Great Saint Helen's in 1720, and recently demolished.

THE Carpenters' Company hold their annual examination in carpentry and joinery next week, and we are informed that, in spite of last year establishing a record in the number of entries, the candidates bid fair this year to equal in numbers those of 1896. This series of lectures delivered at Carpenters' Hall during the past few weeks have been, as usual, very well attended, and among the lecturers were Professors Banister Fletcher, T. Roger-Smith, and other well-known architects. The Carpenters' Company are providing really valuable aid in these lectures, and we note with satisfaction the number of builders' foremen and others who are anxious to obtain the Company's certificate.

THE Court of the Drapers' Company having been informed that the library with which Oxford University was endowed by Dr. Radcliffe has outgrown the accommodation provided for it, the Court of Assistants have passed a resolution to the effect that Mr. T. G. Jackson, R.A., be requested to advise them as to the erection of a building suitable for the Radcliffe Library, on a site which it is understood is available for it, and should it be found that such a building could be erected for the sum of £15,000, the Company will be happy to undertake the erection of it, of course in the first place submitting the architect's plans to the University authorities for approval. This munificent offer has been communicated to the Vice-Chancellor of the University, and on Tuesday next the Senate will be asked to pass a decree returning to the Drapers' Company their cordial thanks. It is suggested by the clerk to the Drapers' Company in his letter that the removal of the library to a new site would probably enable the University to utilise the present building for the accommodation of its medical school.

THE fifteenth annual exhibition of the Royal Cambrian Academy was opened on Monday at Plas Mawr at Conway. The place of honour is occupied by "A Family Group," painted by Mr. Alma-Tadema, an honorary member of the Academy, the president of which, Mr. Clarence Whaite, R.W.S., contributes a picture portraying sunrise on the Carnarvonshire mountains. Another painting by the president, depicting Winter's "Snow," also illustrates Snowdonian scenery. Mr. Joseph Knight, R.I., as in previous exhibitions, is represented by several original mezzotints. In the Victorian room there hangs from the brush of the same artist a portrayal of "A Deserted Quarry," a sketch sadly suggestive of the unhappy state of affairs at Bethesda. Mr. Stacy Marks, R.A., another honorary member of the Academy, contributes several of his well-

known works dealing with bird life; Professor Hubert Herkomer lends a portrait of the Bavarian Prince Regent; and the Wynn Room is entirely devoted to etchings by Mr. Alfred Slocombe and Mr. Harold Hughes (Bangor); A.R.I.B.A., the honorary architect to the Academy. Mr. Leonard Hughes (Holywell) exhibits portraits of his mother, the late Mr. John Roberts, M.P., and the Rev. Silas Evans. Amongst other exhibitors are the late S. Sidley, Messrs. Joseph Knight, J. Parker, R.W.S., Ben Fowler, J. Pain Davis, Hamilton Marr, Anderson Hague, G. A. Humphreys, Oliver Baker, Parker Hagarty, G. Sheridan Knowles, and S. J. Hodson.

WITH the sanction of the Liverpool Corporation, an experiment is being made in Clayton-square with a new street indicator. It takes the form of an ornamental disc of mosaic work, in a scheme of blue and chocolate, and is about 3ft. in diameter. In the centre, figured in white, is the compass, showing north, south, east, and west, and the half points. The four streets leading off from the site of the indicator are named in bold, plain white lettering, legible at any hour of the day or night—viz., Cases-street, Parker-street, Houghton-street, and Elliot-street. Names read from the centre outwards, and under each in smaller type, but still bold and legible, are the names and distances of various important centres which are most frequently the object of inquiry on the part of strangers and visitors. Thus, under Cases-street, appear the words, "To Central Railway Station, 130," "To Central Low-level Railway Station, 150." To Sailors' Home, to Custom House, to Dock Office, to General Post-Office, with the distances appropriate in each case. Similarly, the remaining sections of the indicator display clearly the direction to take and the distance to travel to reach by the shortest route the other chief railway stations, the Walker Art Gallery and public buildings, the Landing-stage, &c.

THE Mansion House Council on the Dwellings of the Poor in their thirteenth annual report just issued state that there is even a stronger necessity than in the past for keeping a steady watch upon the work of the local authorities, upon whom is devolved the serious responsibility of making and keeping their various districts in sound sanitary condition. During the past twelve months 10,684 inspections had been made, dealing with 7,545 houses in all parts of London. Of these they had been able to get the defects remedied in 3,624, while 2,108 were still under consideration, and 1,813 had been dismissed as not being sufficiently bad to take any action upon. The condition of West Ham had again received attention, and the action of the council in Tottenham had resulted in the appointment of an additional inspector. In Rotherhithe, the sanitary condition of which had been under consideration for nearly nine years, practically the whole of the defects had been remedied. None of the districts were successfully dealt with until the greatest pressure which was possible had been put upon the local authorities by the council, and even then appeals had to be made to the Local Government Board and the London County Council before any radical remedy was applied.

At Manchester, on June 3rd, Col. J. T. Marsh, an inspector for the Local Government Board, held an inquiry with reference to an application from the City Council for leave to borrow a further sum of £130,000, for the purpose of extending the existing system of electric-lighting. The assistant town clerk explained that the present demand for the electric light in Manchester far exceeds the supply. The capacity of the plant is equivalent to 128,000 lamps at 8-candle power; but the demand already runs to 161,594, and it is steadily growing. In 1893, when electric-lighting was first introduced, there were only 289 consumers, with 32,176 lamps. Now the consumers number 1,620, and the lamps supplied 147,068. If by any chance the whole of these lamps had to be lit at once the plant would be inadequate to the supply. The consumption of electricity had increased in twelve months by no less than 54 per cent., and the whole of the consumption hitherto had been for private purposes. The Corporation, however, are now using the light experimentally for public purposes, and the cost of this service is said to work out at £80 a year less than gas. The profit of the electric-light service last year on a capital expenditure of only £309,000 was no less than £16,812, out of which £10,000 was applied in

relief of rates. At the same time the public now only pay a maximum of 6d. per unit, whilst many large consumers obtain their supply at 3d. per unit.

A VALUABLE paper on "Tests of Bridge Members," by Mr. J. E. Greiner, M.Am.Soc.C.E., appears in the last month's number of the *Transactions* of the American Society of Civil Engineers. The author gives the results of a number of tension tests on bridge members. Some of these relate to the strength of built-up tension members, others to the net area required back of pinholes in plates having sheared and planed ends, to the tensile strength of single angles having ends riveted to connection-plates, and to the strength of steel worked partly hot and partly cold. These several data are given in a series of tables, and the fractures are shown by photo. illustrations. The beneficial effects of annealing are shown by these experiments. All members which have been partly heated should be annealed.

A LARGE employer of skilled labour, and well-known correspondent to this paper, writes:—"It is Whit-Monday Eve. The sun set in a golden glow five minutes ago (at 8.11). Since my staff left work and were paid on Saturday, I have, personally, put in exactly 23½ hours of right down hard work—and this is no exception to the rule. My work has ever been my chief happiness, hence, I assume, my success."

### MEETINGS FOR THE ENSUING WEEK.

SATURDAY (To-morrow).—St. Paul's Ecclesiological Society. Visit to the Chapel of Hampton Court Palace, under the direction of Ernest Law. Trains from Waterloo, 2.33 and 2.50 p.m.

MONDAY.—Society of Engineers. "The Compression of Air by the Direct Action of Water," by Professor Herbert W. Unney. United Service Institution, Whitehall. 7.30 p.m. Royal Institute of British Architects. Adjourned Business Meeting. 8 p.m.

WEDNESDAY.—Carpenters' Company Examination. 6 p.m.

THURSDAY.—Carpenters' Company Examination. 6 p.m.

FRIDAY.—Carpenters' Company Examination. 9.30 p.m.

SATURDAY.—Edinburgh Architectural Association. Excursion to Linlithgow Palace and St. Michael's Church. Carpenters' Company Examination (Oral). 2.30 p.m.

### CHIPS.

The Croydon Corporation have applied to the Local Government Board for sanction to borrow £32,000 for the construction of new waterworks at Waddon, where boring operations have recently been carried on.

The Lewes Town Council have appointed Mr. David Roberts as their surveyor.

Contracts were accepted by the Aberdeen Corporation on Friday for the extension of the bathing station. The total amount of the expenditure is £7,000.

A new organ which has been placed in College-road Primitive Methodist Church, Quinton, was opened on Sunday. The cost of the organ, which has been built by Messrs. Norman and Beard, of Norwich, is about £250.

At the Auction Mart, Tokenhouse-yard, last week, there was a very fair amount of business done, the aggregate—£119,745—although showing some falling off from the returns in the corresponding week of last year, being as much as could be expected from the supply on offer. A satisfactory feature was the disposal of an estate of over 1,000 acres in Shropshire, suggesting that some reaction from the long-continued depression in agricultural land is gradually taking place. Prices are somewhat better, although the upward movement is but gradual.

A memorial window, just fixed at Bethesda Methodist Chapel, St. George, Bristol, was unveiled on Sunday afternoon last. It was designed, and the work carried out, by Mr. A. J. Nott, ecclesiastical glazier, Stapleton-road, Bristol.

At the public offices, Egremont, on Tuesday, Colonel W. R. Slacke, R.E., Local Government Board inspector, held an inquiry into an application by the Wallasey District Council for power to borrow £1,500 for the provision of a recreation ground at Egremont. The ground is situated at the bottom of Maddock's-drive, adjoining the promenade, and near the Mariners' Home, and the main purpose in acquiring it is to provide a band-stand. The site contains 3,395 yards, and will cost about £1,000, while £500 will be required for the purposes of draining, fencing, &c.



## Trade News.

### WAGES MOVEMENTS.

**CRIEFF.**—The Crieff and Muthil operative masons came out on strike on Monday owing to the masters not having complied with their demands. The terms asked by the men are that the present rate of wages of 8d. per hour be maintained for one year; also that 4d. per hour be paid extra when the men are employed two miles or more outside the town; while proper shed accommodation be provided during wet weather.

**DUNDEE.**—A mass meeting of the operative masons of Dundee was held in Plumbers' Hall, Bain-square, on Friday night to consider upon a course of action in view of the refusal of the employers to grant an increase of 4d. per hour upon the present rate of wages. The meeting was one of the largest of the kind ever held in the city, there being about 500 men present. It was intimated at an early stage of the proceedings that the firm of Mr. Adam Will had granted the advance desired. After a discussion lasting two hours, a vote was taken by ballot, when, by an overwhelming majority, it was resolved to come out on strike, and to remain out until the increase should be granted. The number of men affected by the strike is between 500 and 600. The present rate of wages is—for hewers, 8½d. per hour, and for builders, 9d. per hour. At a private meeting of the master builders of Dundee held the same evening, unknown to the operatives, the wages question was again considered, and it was ultimately resolved to raise the wages by 4d. per hour to hewers and builders. This decision was not known to the operatives before their meeting terminated. The decision of the masters will probably prevent a strike.

**HUDDERSFIELD.**—At the instance of the Mayor, Mr. John Burnett, of the Labour Department of the Board of Trade, visited Huddersfield on Friday, and had an interview with the Mayor in reference to the masons' and labourers' dispute at Huddersfield. It seems that the master masons' society were in favour of the dispute being settled by arbitration, and passed a resolution to that effect. Mr. Burnett informed the Mayor that he had met representatives of the operative masons' society, and that they had told him that before they would have anything to do with arbitration under the Conciliation Act the masters must approach them direct. The labourers, at a general meeting on Thursday night, passed a resolution refusing arbitration by a representative of the Board of Trade, and stating that the dispute was a matter for settlement direct between the masters and men. Most of the masons in the Huddersfield district have got work elsewhere.

**IPSWICH.**—The dispute here has been settled this week, and both masters and men have agreed to discountenance overtime as much as possible.

**LONDON.**—In the metropolitan building trade there came into operation on the 1st inst. a new code of rules affecting 20,000 labourers. By this code general labourers receive 7d. an hour, scaffolding-riggers and hoisters 7½d., and timber men 8d., being 4d. an hour rise all round. Last year the union expended £3,000 in a fruitless endeavour to obtain the concessions, which the employers have now granted without a struggle.

**NEWCASTLE-ON-TYNE.**—The stonemasons of Newcastle and district ceased work on Saturday in consequence of the refusal of the associated employers to concede a reduction of hours to 4½ per week in the summer. They want the eight hours' day from Monday to Friday, and the 4½ hours' work on Saturday. There are said to be about 500 men on strike, although all the smaller employers have agreed to the demand, 140 men, it is said, having thus received the reduction.

**NORTHWICH.**—The dispute between the Northwich and district bricklayers and their employers was practically settled on Friday. With the exception of two of the master builders, all the firms in the district have conceded the advance of 1d. per hour, having given 9d. instead of 8d. This is the amount demanded by the men, who have been on strike about five weeks.

**NORTH SHIELDS.**—The strike of painters in North Shields has come to an end after continuing for five weeks, the men having agreed to accept 8½d. per hour. Mr. Sowerby, of Manchester, on behalf of the men, had an interview with Mr. Milburn, as representing the masters, with the result that certain alterations in the rules were agreed upon. One regulation, which required the men to give one month's notice before ceasing work, has been so amended as to extend the notice to three months. Formerly the men had to work 50 hours before they could count overtime. This is now to be regulated by the shop hours of the masters.

**OXFORD.**—The carpenters and joiners of the city are demanding an increase of wages to 8d. an hour and an alteration of rules. An interview has been

held by a deputation with Mr. Kingerlee, president, and Mr. Castle, secretary of the Oxford Master Builders' Association, who could not see the way to grant the alterations asked for.

**PLYMOUTH.**—Although the strike has now continued for nearly a month, no signs of a settlement are discernible. The masters have offered to grant an advance of a halfpenny per hour from the first week in November; but this has been rejected by the men. On the 1st of July, unless the carpenters of the Exeter district are conceded the extra penny per hour which they have demanded, the men will come out. At present the rate of wage is 6½d. per hour, which gives an average weekly wage of £1 10s. 7d. in summer, and £1 6s. 6d. in winter.

**SITTINGBOURNE.**—The brickmakers in Kent were paid on Saturday on the advanced scale of an additional 10 per cent. The new arrangement was received with unqualified satisfaction by the men. The extra rates of payment granted this season amount to an aggregate of 20 per cent., and it makes a difference of some hundreds of pounds in the wages bills of the principal firms.

**WESTON-SUPER-MARE.**—The combined strike and lock-out in the building trade here have continued since the 1st of May, and for six weeks public and private building operations have been almost at a standstill.

The directors of the Sun Fire Office have commissioned Mr. Stanhope A. Forbes to paint a panel at the Royal Exchange. The subject will be an historical one, representing a scene in connection with the Great Fire of London.

The Royal Assent was given on Friday to the following among other Bills:—London (Clare Market, Strand) Provisional Order, Great Western Railway (Truro and Newquay Railway), Torquay Corporation Water, Clyde Navigation (Extension of Time), Great Eastern Railway (Lowestoft Harbour), ditto (New Lines), London and South-Western Railway (Meon Valley Railway), Charing Cross, Euston, and Hampstead Railway, Epsom Downs Extension Railway, Great Central Railway, and the Lancashire, Derbyshire, and East Coast Railway.



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Wrought-Iron Girder Plates.....	5 15 0 "	6 10 0
Bar Iron, good Staffs.....	7 0 0 "	8 0 0
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 0 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	7 17 6 "	8 5 0
Best Snedshill.....	10 0 0 "	10 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.		
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		

	Per ton.	Per ton.
8ft. to 8ft. long, inclusive gauge.....	£10 15 0	£11 0 0
Best ditto.....	11 5 0	11 10 0
Cast-Iron Columns.....	£6 0 0 to	£8 10 0
Cast-Iron Stanchions.....	6 0 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0 "	5 15 0
4in. to 6in.....	5 5 0 "	5 10 0
7in. to 24in. (all sizes).....	4 15 0 "	5 0 0

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	Per ton.	Per ton.
Pig Iron.....	105s. to 110s.	
Cold Blast, Lilleshall.....	57s. 6d. to 62s. 6d.	
Hot Blast, ditto.....		
Wrought-Iron Tubes—Discount off Standard Lists f.o.b.		
Gas-Tubes.....	75p.c. Fittings 77p.c.	
Water-Tubes.....	70 "	72s
Steam-Tubes.....	62s "	65
Galvanised Gas-Tubes.....	60 "	62s
Galvanised Water-Tubes.....	55 "	57s
Galvanised Steam-Tubes.....	45 "	47s

	Per ton.	Per ton.
Sheet Zinc, for roofing and working up.....	£22 10 0 to	£23 15 0
Sheet Lead, 3lb. per sq. ft. super.....	14 0 0 "	14 15 0
Pig Lead, in lwt. pigs.....	13 10 0 "	14 10 0
Lead Shot, in 28lb. bags.....	16 10 0 "	17 0 0
Copper Sheets, sheathing and rods.....	63 0 0 "	63 10 0
Copper, British Cake and Ingots.....	51 15 0 "	52 15 0
Tin, Straits.....	61 11 3 "	62 1 3
Do., English Ingots.....	64 0 0 "	64 15 0
Spelter, Silesian.....	17 5 0 "	17 7 6

	Per ton.	Per ton.
Cut Clasp Nails, 3in. to 6in.....	£3 15 0	£9 15 0
Cut Floor Brads.....	8 10 0 "	9 10 0

	Per ton.	Per ton.
Wire Nails (Points de Paris)—		
0 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/9 16/9		per cwt.

### TIMBER.

	per load	£13 15 0 to	£16 10 0
Teak, Burmah.....	11 10 0 "	15 10 0	
" Bangkok.....	—	—	—
Quebec pine, pitch.....	1 15 0 "	3 15 0	
" yellow.....	5 5 0 "	6 5 0	
" Oak.....	3 15 0 "	5 10 0	
" Birch.....	4 0 0 "	5 5 0	
" Elm.....	3 5 0 "	4 10 0	
" Ash.....	2 10 0 "	3 10 0	
Dantaic and Memel Oak.....	2 15 0 "	4 15 0	
Fir.....	2 0 0 "	4 5 0	
Wainscot, Riga p. log.....	4 10 0 "	5 10 0	
Lath, Dantaic, p.f.....	5 0 0 "	6 10 0	
St. Petersburg.....	8 0 0 "	9 0 0	
Greenheart.....	4 0 0 "	15 0 0	
Box.....	0 1 9 "	0 1 10	
Sequoia, U.S.A., per cube foot			
Mahogany, Cuba, per super foot			
lin. thick.....	0 0 4s "	0 0 6s	
" Honduras.....	0 0 4s "	0 0 5s	
" Mexican.....	0 0 4s "	0 0 5s	
Cedar, Cuba.....	0 0 4s "	0 0 5s	
" Honduras.....	0 0 4s "	0 0 5s	
Satinwood.....	0 0 7s "	0 1 0	
Walnut, Italian.....	0 0 3s "	0 0 7s	
Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.			

	£19 10 0 to	£25 10 0
Quebec, Pine, 1st.....	14 0 0	16 10 0
" 2nd.....	6 10 0	10 0 0
" 3rd.....	10 10 0	12 0 0
Canada Spruce, 1st.....	8 0 0	9 5 0
" 2nd and 3rd.....	7 10 0	8 5 0
New Brunswick.....	7 10 0	8 10 0
Riga.....	9 10 0	13 10 0
St. Petersburg.....	9 0 0	16 10 0
Swedish.....	9 0 0	9 10 0
Finland.....	10 10 0	17 0 0
White Sea.....	5 0 0	20 0 0
Battens, all sorts.....	—	—
Flooring Boards, per square of lin.:		
1st prepared.....	0 8 6	0 15 6
2nd ditto.....	0 7 0	0 12 0
Other qualities.....	0 5 6	0 6 9
Staves, per standard M:—		
Quebec pipe.....	35 0 0	42 10 0
U.S. ditto.....	230 0 0	210 0 0
Memel, cr. pipe.....	200 0 0	210 0 0
Memel, brack.....	—	—

### OILS.

	per ton	£14 7 6 to	£14 17 6
Linseed.....	26 5 0	27 0 0	
Rapeseed, English pale.....	23 10 0	25 10 0	
Do., brown.....	14 15 0	15 5 0	
Cottonseed ref.....	29 0 0	29 15 0	
Olive, Spanish.....	23 0 0	24 0 0	
Seal, pale.....	27 10 0	27 15 0	
Cocoonut, Cochin.....	23 5 0	23 10 0	
Do., Ceylon.....	20 10 0	22 10 0	
Palm, Lagos.....	19 0 0	20 0 0	
Oleine.....	0 6 3	0 7 6	
Lubricating U.S.....	0 4 9	0 6 6	
Do., black.....	1 2 0	1 5 0	
Tar, Stockholm.....	0 12 6	0 15 0	
Archangel.....	21 0 0	21 10 0	
Turpentine, American.....	—	—	—



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### PRACTICAL QUALIFICATIONS.

THE ability to determine on the spur of the moment any practical question that may arise in construction or building operations is one of the chief qualifications of the architect. A man conversant with theory is seldom able to turn his knowledge to immediate account; he is often like the student of mathematics who, when a catch question is given, is unable to grasp the real meaning of the proposition, and is very often "floored" by the man who, with far less knowledge of arithmetic, is able to give the right answer. And it is not unusual to find players of billiards or chess who are experts in the laws and science of those games baffled by those who have learned by a kind of instinct certain "moves" and proper strokes of play to confound their adversary on very simple issues. The engineer and architect are repeatedly called upon to determine points at short notice, and to make up their minds on details which cannot be acquired by any amount of preparatory study or reading. A land spring has undermined a dock wall or blown up the floor of a basement. Immediate measures must be devised and carried into effect to meet the emergency. The engineer would find little aid in these points from consulting treatises on construction; yet must be prepared for immediately dealing with the matter. Both in play and practice a steady hand and quick perception are absolutely necessary to success. No amount of study of the laws of "natural angles" will help the billiard-player to make a "cannon" or a "winning hazard," and it is almost as certain that the student who has passed the most rigid examination on the strength of materials and structures, will be unable to cope with the constructive expedients necessary to prevent the subsidence of a tower or a roof, so well as the practical builder whose clear head and practical perception is able to take in with a glance the best means to avert an accident. The expert, by a few rapid steps in his own brain, is enabled to arrive at the exact cause and remedy, which it would take the man who solves everything by the slow ratiocinative process of mathematical analysis a much longer time to arrive at.

In every-day practice the architect and engineer both find out that their theory and book study, valuable though it be in disciplining the mind, must be supplemented by a good many "rough and ready" and approximative methods. The architect finds there are a number of little things which he must, so to say, keep "up his sleeve" ready to be applied on any emergency. He may have been taught to condemn and look down upon "rule-of-thumb" methods; but he finds after all that "rule-of-thumb" calculations and methods are sometimes of more practical value to him than the longer way of science and reasoning. How many an architect has found that a perusal of a table of safe working loads under given conditions of weight, with an example of an actual girder, is of more service to him than an elaborate calculation of the requirements according to theory or published formulæ? In designing a timber roof for a large span a good old example is of more value than a careful study of all the treatises written by Tredgold or Kraft or Rondelet. These treatises teach a theory and mode of calculation for finding the strength and dimensions of timbers according to prescribed forms of roof, but they do not help the architect

to design a truss of a different type, or tell him if it is capable of standing without endangering the walls, or can resist the force of wind. If he wishes to know whether his braced hammer-beam or ribbed roof truss will answer, he must resort to the modern method of graphic statics, or refer to some other roof of similar construction to enable him to find the scantlings of the members. As in many other special branches of construction, he has to appeal to facts. He may be satisfied with his design as a piece of framing; but not as to the scantlings he should specify for his principals, collars, and braces.

To take another instance from practical carpentry, whoever would have thought it possible that temporary wooden erections, such as those which now obscure some of our historic buildings and churches along the route of the great Jubilee pageant, would have exercised the inventive thought and practical skill of our architects? Except in structures like race-stands, scaffoldings, gantries, and the like there was nothing to give an architect any idea of what was to be provided. At a moment's notice many architects have had to prepare plans and drawings or specifications for every conceivable situation, from ordinary seat-stands in rooms, exterior balcony-like erections, stages on roofs, and all manner of recesses and corners where a vantage-ground could be found, to colossal independent structures framed upon scientific principles of carpentry like those erected round many of our Strand and City churches, and by Mr. Maskelyne in his pavilion near St. Paul's. From brick and stone or ordinary building materials, the architect had to suddenly divert his mind to timber balks, and sawn timber in scantlings, planks, deals, and battens, and to design and specify details of structures of a kind he had little practical knowledge of. There was no time to consult authorities (if there are any), except the conditions of the London County Council. The novice in this kind of construction may naturally bethink himself of ordinary carpentry work, but a few weeks ago there was nothing to work upon like there is to be seen now; no models or practical data of scantlings, joints, seating allowance, &c. To such cases as these the man of practical experience, who has had to rig up scaffoldings, shores, and wooden erections of various kinds, can turn his mind. As for the novice, in vain he pores over the pages of his Tredgold and Nicholson for questions of the supporting power of timber to bear galleries of certain angles of inclination or a number of other details. He is confronted with the real difficulty of applying his theoretical knowledge to particular structures. The student may understand the position of the resultant of a load of people placed in a slanting position like a gallery high up above the ground; he knows it to be compounded of the weight through the centre of gravity of the loaded structure and the thrust outwards, but how he is to counteract the overturning effect of this derived force in the best and most economical way or to frame his structure is the difficulty he has to face. And so it is with a great many other subjects. His knowledge permits him to theorise; but when he has to put in practice what he knows, he discovers many discrepancies. Thus it is so many awkward questions occur in practice. A hall or concert-room is to be built which is required to be a good one for sound, in which the recommendations of physicists and musicians have to be met. In what way is the architect to proceed to prepare his plan and design? Must he ignore all traditions of proportion and construction to make his roof agree with the theory of experimentalists; contract the size of the room at one end, lower the ceiling over the platform,

raise the floor, fill up the corners of his rooms, &c.? This is a question which still perplexes the architect, and has not yet found a satisfactory solution. On another occasion it may be the construction of a fireproof building for a given purpose. The architect may know every method of fire-resisting construction, every patented floor; but when he has to get out the working drawings and specifications, he finds himself face to face with many details of execution which can only be mastered by one who has gone over the ground previously, who knows how a particular "system of flooring" can be adapted to the purpose of the building. Even the choice of a "fireproof floor" is not an easy matter. It may be required by the promoters of a school to construct a soundproof floor between a lower and upper schoolroom. The question cannot be immediately answered. Where the soundproof material, if any, is to be introduced, whether under the flooring or in the ceiling, must be a matter to be determined before the details and specification can be made. We get many questions from correspondents on details of practice which show the extent to which the architect's powers may be taxed. One of these is about slates. A general acquaintance with the quarries and qualities of slates, their sizes and mode of hanging, is not enough. An owner wants his building covered with light-green slates that are non-porous, and the architect has to specify a particular slate and the lap necessary. He must, therefore, be prepared with exact information about the particular slate. A general knowledge of the leading building stones can be learned from books and practical lectures, but they will not enable the architect in all cases to avoid egregious mistakes in the selection of his stone. Even if he specifies the right name, he does not know the bed or the conditions necessary for its durability. So with timber. Only the expert in the importation of timber can determine the wood that will give the best and economical results. The practical carpenter, if the choice were left to him, is more likely to select the best material for his purpose than the ordinary specifier. He uses the timber that is best adapted to his work and tools. Knowing the market scantlings, he is more likely to select deals or battens for joists and rafters that are seasoned and straight in the grain. Medium-quality Swedish red or yellow deals and battens from the best shipping ports are more reliable for ordinary purposes than the timber generally specified. Only for large scantlings, such as beams, does he use Memel or Dantzic, and then the medium quality satisfies him.

In no other branch of construction is expert knowledge more necessary than in that of materials. A vast deal of theoretical knowledge may be learned that is hopelessly misleading when the student comes to his real building. How much that is written about ironwork in general treatises can be relied upon in practice! A young architect may be primed in all the theory of finding the proper section of an I-shaped girder for a given load; but when he is confronted with the details of the ironwork, say for a factory for a specific purpose, and has to draw and specify the actual sections of every beam to bear the vibration of machinery as well as the dead weight of the floor, his assumed loads and strengths per square inch of sectional area are subject to revision; he has to deal with concrete facts, dimensions of flanges and webs and columns, and a considerable margin of safety has to be allowed for. We have only to bear in mind the failures of structures largely composed of iron columns and girders in the United States, which have been designed and carried out with apparently every care, to see how little theory and practice agree. An iron column may be calculated with mathe-



matical nicety as to its diameter and thickness, yet by some unseen disturbance of the centre of pressure caused by the foot-plate yielding a fraction of an inch, or some inequality in the thickness of casting or flaw in the metal, disastrous failure and collapse of the whole building has taken place. Again, the most nicely calculated design, and the most reliable proportions may, through bad or careless workmanship, like the defective adjusting of a bearing or bolt, be thrown entirely away. Our talents so frequently outrun our practical perception, that we often see the best talents wasted on buildings without any grasp of the actual requirements; but it is the quick in thought and action who succeed in the profession; the man who knows how to put his ideas into concrete shape and in the best form; the man who can say at a moment's consideration what is the best course to pursue to meet a difficulty, who can design his details with an instinctive sense of what they are intended to accomplish; and the man who can so grasp the constructive problem presented to him as to dispense with the labour of working out an elaborate formula. Whether it is in such common things as the selection of a stone or a slate, the mode of constructing a fireproof floor or a roof, how to strengthen a weak floor, to lay a zinc flat, or to form a casement that will keep out the rain, the practical mind is not beyond the subject, and will invariably find a way that is generally the truest and best.

#### JUBILEE ERECTIONS AND DECORATIONS.

THE Jubilee fever is at its height. Since our remarks last week on the temporary wooden structures put up along the route of the Jubilee procession, the bare boards, posts, and planks have begun to assume a festive garb. A note of colour has been added to the scene. The popular scarlet baize, as being the cheapest and most festal material within reach, is being used with a lavishness which probably has never been equalled before, relieved by emblems and trophies of many colours and nationalities. A word or two we must, however, add about the structures themselves; a double page of sketches of a few of the principal of them we give this week. Probably, never before in our annals has timber been employed so largely in temporary erections as it has been during this Jubilee fever, and the trade of the carpenter has seldom been in greater requisition, or has commanded so high a wage. As we pass along the route and take stock of these improvised structures, it must be confessed that some ingenuity has been shown in adapting seats to irregularities of the buildings, as, for example, in fitting them into angles and recesses, into areas of varying depth between the buildings and the front railings, to windows, recesses, flats over shops, roofs and porches, and these exercises of the carpenter's art have called for no small amount of skill to properly comply with the rules of the London County Council, as in the case of St. Dunstan, Fleet-street (see sketch). To take as one instance the front balcony erections which are put up against countless houses, public offices, and churches, the first question that occurs to us is, How are these structures tied to the building behind them? Have the tiers of seats not only been made to rest vertically on the timber supports which have been erected, but at the same time been secured by iron ties or rods or stays to the walls or through the window openings? For if not, they can hardly be considered safe. Many of them have diagonal braces at each pair of supports, but have the sloping bearers for seats been tied in to the back supports by tie-beams or iron rods properly bolted? This is a necessary precaution

to avoid the outward push of the load (see sketch of St. Martin's Church). We understand the authorities have ordered structural alterations to be made to at least one important structure put up round a church in the Strand, because there was not sufficient tie to the building. We have already alluded generally to sloping stands holding many hundreds of people. Piccadilly and St. James's-street are lined with balconies, and every owner of club-houses and hotels is vying with his neighbour to provide the largest number of seats. Among these we may mention Apsley House, the old town residence of the Duke of Wellington, and Devonshire House; also the houses of Sir Julian Goldsmid, Baron Hirsch, Baroness Burdett-Coutts, &c., these are decorated by bunting, gas devices, and electric means for illumination.

The great sloping stages to hold several hundreds of spectators have more base to stand upon, but equally require a well-devised system of bracing and ties to rigidly secure the uprights to the sleepers, and so prevent them from turning or straining the joints. The stands in front of the Charing Cross Station, behind St. Martin's Church, in Whitehall, St. Clement Danes (of which we give a sketch), Pall Mall, and many other places are structures of this class, and the higher they are the more necessary it becomes to brace them. Those which have adopted the framed roof truss system of construction, each support or truss having a direct tie-beam into which the slanting beam is notched and bolted, with braces halved and bolted through, are the most satisfactory. Timbers connected by "dogs" which preserve a parallelism, and have the raking platform timbers simply resting on longitudinal purlins, must largely depend for their security on the diagonal bracing between the uprights.

Scarlet baize is the principal item on the decorations—it was bound to be; but it is a particularly hot colour for a June day, unless relieved by other colours and devices. We find that in the City and West-end it will be the prevailing hue. Every staging and seat is covered with it, even the upright timbers and fronts of balconies; and the red baize is largely used as a covering to the street masts which line the chief streets. Some of these, as in those put up in the Strand, have their lower part covered with it, and the upper portion of the pole is twisted with cloth of red and yellow. A little below the top, which has a gilt crown finish, four light wooden brackets are fixed, forming an ornamental capital, which will be decorated with devices. How these will be treated remains to be seen. We believe a committee of taste has been formed to devise a scheme. Decoration by flags, &c., across the streets are prohibited, the lines of festoons and emblematic devices being confined to the longitudinal direction. In Fleet-street square venetian pillars, draped with violet cloth, with designs of oak-leaves and crowns of flowers at the top, are fixed. Many very tasteful and elegant arrangements of curve and double garlands are possible, and to afford means of suspending the loops, &c., wires connect the masts, as those along London Bridge, where specially-designed supports, having wreaths and bearing artificial flowers from bracket-capitals, have been fixed. The Corporation Stand round St. Paul's will be decorated by draped striped cloth of the prevailing colours between the uprights, each of these being surmounted by flags or trophies. The Mansion House will be a blaze of light and colour, the columns being wreathed, and devices and trophies of flags in the pediments, while banners and wreaths will float upon the upper balustrades of the parapet. Much can be done by draping, and tropical displays of flags and devices, if tastefully made, to relieve and emphasise the architectural lines. Some-

times these attempts rather obscure the buildings. Handsome edifices have been hidden by balconies and bunting in many places; but a great deal will depend on the scheme of decoration attempted. At the corner of Parliament-street a large block of offices is undergoing transformation, lines of lamps and a huge crown of coloured lamps on the corner cupola being introduced. But of the results more may be said next week.

#### THE ELECTIONS AT THE R.I.B.A.

AT the business meeting of the Royal Institute of British Architects, held on Monday evening, the President, Professor George Aitchison, A.R.A., in the chair, the scrutineers announced the results of the voting for members of council and committees for the ensuing session as follows:—

PRESIDENT:—\*Professor George Aitchison, A.R.A.

HONORARY SECRETARY:—\*William Emerson, Hon. Secretary.

VICE-PRESIDENTS (4):—\*William Milner Fawcett, M.A. Cantab., F.S.A., Vice-President; \*Henry Louis Florence; \*Ernest George, Vice-President; \*Edward Augustus Grüning.

MEMBERS OF COUNCIL (18):—\*John Belcher; \*Thomas Blashill; James Brooks, Past Vice-President; \*John McKean Brydon; \*William Douglas Carle, M.A. Cantab., F.S.A.; \*Thomas William Cutler; \*Campbell Douglas (Glasgow), Past Vice-President; \*John Alfred Gotch, F.S.A. (Kettering); \*Alexander Graham, F.S.A., Past Vice-President; \*Charles Hadfield (Sheffield Society); \*Benjamin Ingelow; \*Edward William Mountford; \*John Slater, B.A. Lond.; \*Richard Phené Spiers, F.S.A.; \*Henry Heathcote Statham; \*Paul Waterhouse, M.A. Oxon.; \*Aston Webb, F.S.A., Past Vice-President; Ralph Selden Wornum. (Eighteen nominations, two of the unsuccessful candidates being members of the retiring council.)

ASSOCIATE-MEMBERS OF COUNCIL (2):—Edward Guy Dawber, Arthur Smyth Flower, M.A. Oxon., F.S.A. (Three nominations, the unsuccessful candidate being a member of the retiring council.)

REPRESENTATIVES OF ALLIED SOCIETIES (8):—\*William Larkins Bernard, Bristol Society of Architects; \*Albert Nelson Bromley, Nottingham Architectural Society; \*Thomas Drew, R.H.A., Royal Institute of the Architects of Ireland; \*John Ely, Manchester Society of Architects; Leslie Ower, Dundee Institute of Architecture; \*Henry Perkin, York Architectural Society; \*Arnold Thorne, Devon and Exeter Architectural Society; \*Edwin Montgomery Bruce Vaughan, Cardiff, S. Wales, and Monmouthshire Architects' Society.

REPRESENTATIVE OF THE ARCHITECTURAL ASSOCIATION (LONDON):—\*Hamden William Pratt.

ELECTION OF TWO AUDITORS, 1897-98:—Edmund Woodthorpe, M.A. Oxon., Fellow; Owen Fleming, Associate.

ART STANDING COMMITTEE:—Fellows (10): \*John MacVicar Anderson, \*John Belcher, \*James Brooks, \*John McKean Brydon, \*William Douglas Carle, M.A. Cantab., F.S.A., \*Ernest George, \*Edward William Mountford, \*Beresford Pite, Alfred Waterhouse, R.A., \*William Young. (Eleven nominations, the unsuccessful candidate being a member of the retiring committee.) Associates (6): Robert Shekleton, Edward Guy Dawber, \*Owen Fleming, \*James Sivewright Gibson, \*Henry Thomas Hare, John William Simpson. (Eight nominations, one of the two unsuccessful candidates being a member of the retiring committee.)

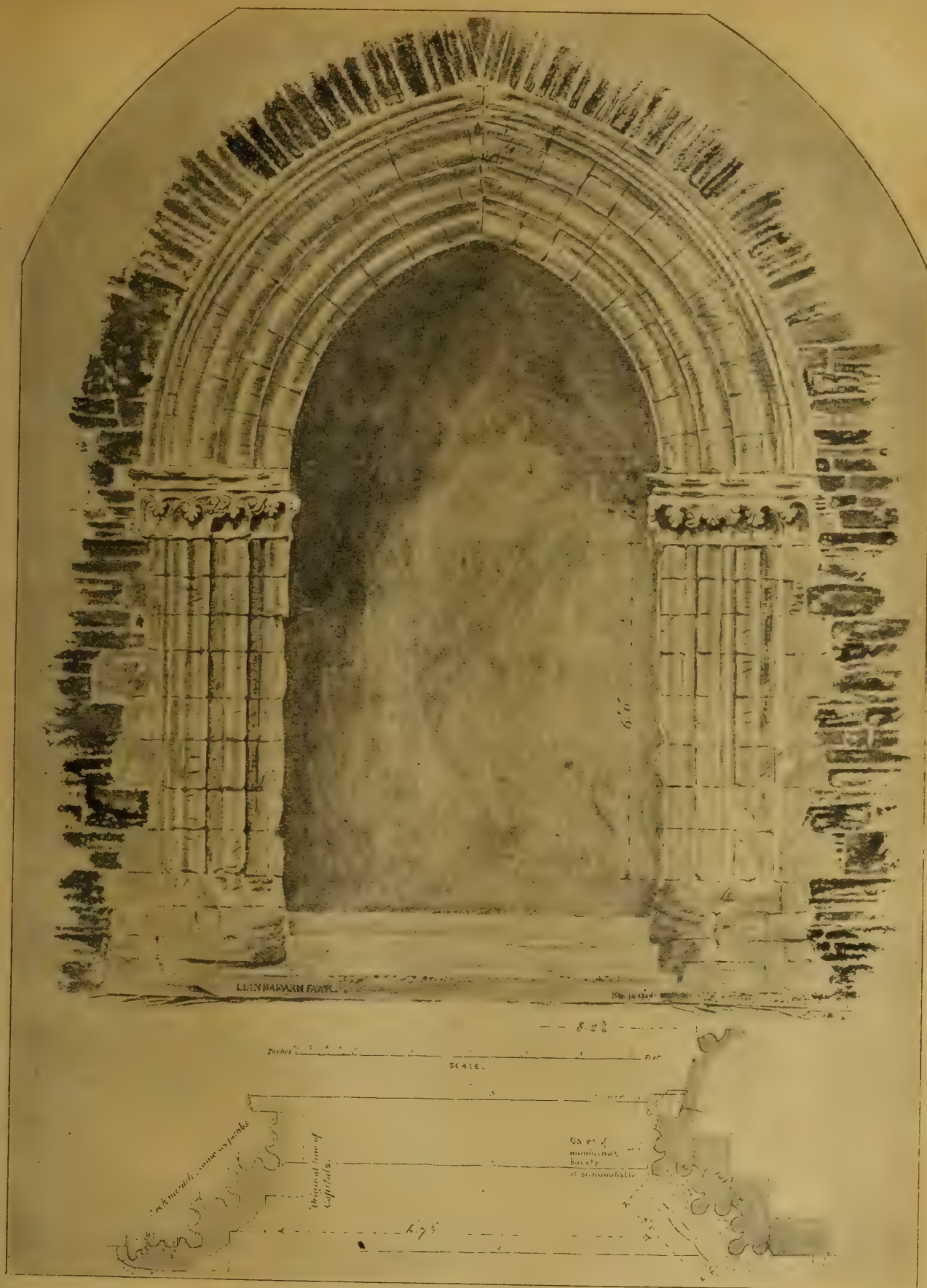
LITERATURE STANDING COMMITTEE:—Fellows (10): \*Henry Louis Florence, \*Alexander Graham, F.S.A., \*Benjamin Ingelow, John Tavenor Perry, William Alfred Pite, \*Sydney Smirke, \*Richard Phené Spiers, F.S.A., \*Charles Harrison Townsend, \*William Frederick Unsworth, \*Paul Waterhouse, M.A., Oxon. (Thirteen nominations, none of the unsuccessful candidates being members of the retiring committee.) Associates (6): Arthur Thomas Bolton, \*Arthur Smyth Flower, M.A. Oxon., F.S.A., \*Andrew Noble Prentice, \*Ravenscroft Elsey Smith, \*Leslie Waterhouse, M.A. Cantab., \*Percy Scott Worthington, M.A. Oxon. (Seven nominations, the unsuccessful candidate being a member of the retiring committee.)

PRACTICE STANDING COMMITTEE:—Fellows (10): \*Thomas Batterbury, \*Henry Cowell Boyes, \*Samuel Flint Clarkson, \*Edwin Thomas Hall, \*Thomas Harris, \*Alexander Henry Kersey, \*Joseph Douglass Mathews, \*Walter Hilton Nash, \*Lacy William Ridge, \*Edmund Woodthorpe (M.A., Oxon.). (Eleven nominations, the unsuccessful candidate not being a member of the retiring committee.) Associates (6): \*William H. Atkin-Berry, Francis Thos. Willerforce Goldsmith, \*Frederick Henry Appleton Hardcastle, \*Henry Thomas Hare, \*George Richards Julian, \*Augustus William Tanner. (Eight nominations, one of the two unsuccessful candidates being a member of the retiring committee.)

SCIENCE STANDING COMMITTEE:—Fellows (10): \*Lewis Angell, M.Inst.C.E., \*Frederic Richard Farrow, \*John Salmon Quilter, \*Herbert Duncan Searles-Wood, William Howard Seth-Smith, \*Percival Gordon Smith, \*Lewis Solomon, \*William Charles Street, Assoc.Inst.C.E., \*Benjamin Tabberer, Keith Downes Young. (Eleven nominations, the unsuccessful candidate not being a member of the retiring committee.) Associates (6): \*Henry William Burrows, \*Max Clarke, Robert Langton Cole, \*Bernard John Dicksee, \*Matthew Garbutt, Assoc.M.Inst.C.E., \*George Pearson.

N.B.—The asterisk (\*) prefixed to a name denotes a member of the existing council. + No other nomination.





DOORWAY OF LLANBADARN FAWR CHURCH.—Drawn by ROBERT WILLIAMS, F.R.I.B.A.

#### DOORWAY OF LLANBADARN FAWR CHURCH.

THE sketch of the south doorway of Llanbadarn Fawr Church was drawn on the spot. The Early English work is very similar to that of Strata Florida, but the doorway does not seem to have been brought from the ruins of the abbey, as some have thought. The stone is a gritty Somersetshire stone apparently, and on close

examination of the joints of the voussoirs and jamb stones from a ladder, they prove to be as close as the old builders generally liked them; but the edges of the several stones are so worn by the centuries of storm and wind to which the doorway was exposed before the present porch was erected as to give to the casual observer the appearance of very wide and ill-fitting joints.

The freestone of this doorway has been, in the

memory of man, a quarry for the local housewife's "stoning" for the hearth, but it is no longer so.

May I, through you, thank the vicar of Llanbadarn Fawr, his curate, the local secretary, as well as many others who showed us some kindness during the all-too-short visit with the Cambrian Archaeological Association?

ROBERT WILLIAMS.



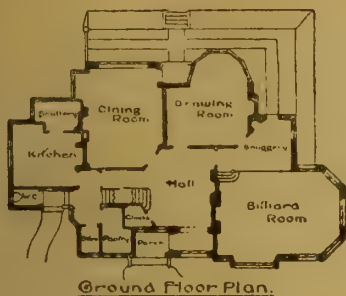
# GERMAN TECHNICAL ARCHITECTURAL INSTRUCTION.

THE following paper on "A German Technical College from an English Point of View," having special regard to architectural instruction, was read by Mr. Edwin O. Sachs on Wednesday, before the International Congress on Technical Education at the Society of Arts:—When I handed in the title of this paper I was under the impression that the time available for reading it would have been the conventional one hour generally given to a lecture, and I had intended making an attempt to describe the chief feature of a well-known German technical college in all its departments. As it has been found necessary, however, to reduce the time available for each paper to 20 minutes, I am afraid that I shall have to confine my remarks to one of the sections of the institution with which I am to deal. This institution is the Royal Technical College at Berlin, which, to my mind, is the leading establishment of its kind to be found in the German Empire, or, for the matter of that, in German-speaking countries, Austria included, and the section to which I shall devote my remarks more especially will be the architectural school or division of that institution. As an architect who has studied there, and has enjoyed the facilities of this special division, it will be easily understood that I should give preference to the department of which I have had considerable personal experience. In the first place, I would give a brief outline of the origin of this institution. The Berlin Technical College, as it now stands, has been in existence for only 13 years, for it is since 1884 that it has occupied the premises it now holds. The scheme of organisation on which the establishment was based dates, however, from 1879, the intervening period being utilised chiefly for the preparation of the necessary buildings which were designed and executed on a lavish scale. The present nature of the institution has grown out of an amalgamation of the old Architectural Academy at Berlin with the Engineering Academy of the same city, which previously had separate existences. Both had passed through similar phases of development, each having been started in a very modest way during the early years of the present century. These establishments were organised under the Prussian Government, and both were owned and practically managed as the property of the Prussian people. The new institution is also essentially a Prussian one, on which the Government of that country spends annually a considerable sum of money, and this point as to ownership of the original and subsequently of the new establishment is an important feature to be remembered. The old Architectural Academy to which I have just referred, though only in working order in the opening days of the present century, officially dates from April 8, 1799, when a charter for a new "Bauschule"—literally "building school," or better school of building construction—was signed by the reigning king, Frederick William III. Its organisation was primarily intended for the education of architects and surveyors who proposed entering Government Service. The first curriculum of this early period included no less than twenty-three subjects, and though the qualifications for entry to the classes almost solely consisted in the possession of a good character and elementary education, the scope of the instruction was by no means limited. I should, perhaps, add that this institution was one of the first of its kind on the Continent. The old "building school" very soon became popular, and consequently its development was rapid, so much so, indeed, that greater restrictions had to be placed on those wishing to become students. A few years later we hear that one year's practical experience in an architect's or surveyor's office was a primary condition for attendance at these classes. In 1801 no less than fifty pupils attended the schools, and in 1805 the number had risen to seventy. Here I would particularly emphasise the fact that the establishment embodied only the requirements indicated by its title. It was a building school pure and simple, not an architectural school in the modern sense. The classes were essentially of a practical nature. Architecture, as an art, and design from an artist's point of view, were subjects dealt with by the Prussian Royal Academy of Art, which had then, as it has now, its architectural studio, and to which members of the "Bauschule" might belong. It was not until the year 1828, when Professor Stier was one of the leading masters of the old establishment, that

the art side of an architectural education received the attention that it had long merited from the executive, and soon after, in 1835, more suitable accommodation for the development of this side was found in an extensive block especially erected by Schinkel. In 1849, the "building school" underwent reorganisation, and became a bona fide architectural academy, managed on university lines, and with all the freedom traditionally associated with German university life, and this not only refers to the organisation of the establishment as such, but also on one hand to the spirit with which the masters treat their students, and on the other, to the manner in which the students applied themselves to their studies. The organisation of 1849 practically remained unchanged until the great amalgamation of 1879 already alluded to. Throughout this period the courses were followed by an examination, which entitled the successful candidate to certain claims for Government employment, and gave him the title of a Government architect, even if he did not choose to avail himself of a public office, but to practise privately as an architect or surveyor. It would lead me too far, were I to touch in a similar manner on the interesting development of the engineering academy, and hence, I shall only note that in 1821 it was first known under the title of the Berlin Technical School. Its development was, as I have said, not unlike that of the architectural academy, both as regards classes, conditions of entry, and so on, while in 1850 it was similarly reorganised on university lines, and from that date became an engineering academy proper. Mechanical and mining engineering, naval architecture, and chemistry were comprised in its programme, and each of these sections was, to a certain extent, regarded as a separate department of the establishment. The amalgamation of these two academies took place, as stated, in 1879, and resulted in the establishment of the Royal Technical College, which in every way possesses a university status, and is in no way to be compared to what we term a "technical college in this country. In order that the college may offer the best opportunities for the most efficient education, the executive retains the leading men of the time for its professional chairs. The social and educational status of the student is high, for every candidate is expected to have enjoyed a superior education at a first-class school. From a German point of view, the expense of sending a youth to this college is by no means a small matter, though it may seem slight in comparison with English university fees. The whole time of the student has to be given up to his college work, a full course of instruction occupying four years, or perhaps longer. The Royal Technical College has its five distinct branches, or, if I may apply the academic term, faculties, i.e. (1) architecture, (2) civil engineering, (3) mechanical engineering, (4) mining engineering, chemistry, and mineralogy, (5) general technical science. Each division has its distinct head who is generally a *savant* of considerable experience, elected from among a body of professors of the section in question; and the chancellor, vice-chancellor, and general council of the establishment are elected on similar lines, subject to the approval of the government and the sanction of the sovereign. The professorships are in the gift of the King, the tutorships are granted by the executive. The students rank with university students, and their characteristics and pastimes are almost identical. The Royal Technical College is housed in what is doubtless the finest building ever devoted to an educational establishment of this description; in fact, it is quite a palace, having considerable architectural pretensions. It cannot be too much impressed on those who have witnessed our technical classes carried on in almost squalid surroundings, how important it is that we should give to technical students a home which in every way embodies the achievements of this age of progress in technical science, and does credit to the period of architecture to which it belongs. I should much like to have described the beautiful building and its practical equipment, which might well serve as a model to the world, though its conception is perhaps almost too elaborate and too costly from an economic point of view. I must, however, content myself with saying that its dimensions are approximately 700ft. by 300ft., and that it has five courts, of which the central one is covered in, and that it has four stories, all of considerable height. Its lecture-rooms are spacious and numerous, and its classrooms and studios

thoroughly serviceable and well lighted. The number of students for which it was intended was two thousand, and to-day, although there are 2,913 on the books, it still admirably fulfils its purpose, though the popularity which its educational facilities have won for it will no doubt soon compel considerable extensions being made. Of these 2,913 students, I should here perhaps at once add that there are only 366 architectural students fully matriculated with 221 non-matriculated, making in all 587; whilst the mechanical engineers number together nearly 1,300. I should also perhaps add that there are a considerable number of foreigners among the students, Russia, for instance, regularly sending a large contingent. But, turning now to the courses available for students of the architectural section, I ought first to say that, besides the subjects taught in the architectural division proper, much that is valuable is to be learned from the civil engineers' department, in the general technical classes, &c., and special facilities are afforded to the architectural student for attending suitable lectures in other sections. The architectural division has eight ordinary and twelve extraordinary professors, and fifteen tutors headed, as I have said before, by a divisional chief elected from among the professors. The courses available include a large number of different lectures on various periods of architectural and art history; further, elementary and advanced drawing, free-hand, perspective, geometrical, and architectural draughtsmanship, water-colour work and modelling. Then, again, there are classes for the general planning of private dwellings and public buildings of all descriptions, for design in various specific styles and for divers purposes, the designing of ornament, of furniture, of lead-glazing, metal-work, &c. In addition to these, there are exhaustive lectures on the evolution of particular features in design, such as that of ornament; while among the more practical subjects every form of construction is taught, from the simplest brickwork to the most complicated iron roofing. The characteristics of different materials are also important subjects dealt with, as are heating and ventilation. Special forms of building are also treated as separate subjects, as well as the various equipments. For instance, we find lectures on the necessary appliances for hospitals, prisons, and libraries. Building legislation is, moreover, not overlooked. Turning to the lectures which are given in other sections, we find those on mathematics, physics, statics, geology, chemistry, book-keeping, and general elementary law, included in the curriculum of the general science division, and in another department the housing of the working classes; in fact, there are few German requirements which are not fully attended to at this college. I use the expression "German requirements" advisedly, for sanitation, which really occupies a very secondary position in a German architectural practice, receives similar treatment at this institution. And, again, the measuring up and sketching on the spot, which we consider so important, the German architect does not appear to appreciate, and, as a subject of study, is almost overlooked in the Berlin curriculum. Of course, the student has to select his own subjects, and to distribute them over the four years which he spends at the Technical College, and if we turn at random to the list of subjects taken up by a first-year man on, say, Tuesday, we may probably find that in the forenoon he attends lectures of an hour each in mathematics, elementary construction, and a class of elementary drawing, and in the afternoon, perhaps, a lecture of one hour on geology or materials, followed by a class of elementary draughtsmanship of from two to three hours' duration, and including, say, instruction in the Classic orders. If we were then to take a fourth-year student's list for the same day, we might, on the other hand, find a two hours' lecture on the history of architecture, and a two hours' class on design in the Renaissance style. Then in the afternoon he may give a couple of hours to practical design, such as the planning of public buildings, and attend an hour's lecture on heating and ventilation. From these examples, it will be seen that in the earlier stages of the Berlin student's work he seeks to obtain a foundation in draughtsmanship and science, while at the latter end of his course he devotes most of his time to the designing of buildings, some historical study, and to gaining a knowledge of special equipment. It would no doubt be interesting to follow the architectural student's career





HOUSE AT ASHLEY HEATH CHESHIRE

FOR WALTER IBBOTSON ESQ.

WILLIAM OWEN AREA  
ARCHT.

from year to year, or from term to term; but this would take too long, and I, therefore, only quote a couple of examples from a student's time-table. But now, after these historical and descriptive notes on the Royal Technical College at Berlin, I would ask if there are any advantages in the system of architectural education adopted by the Prussian Government. To my mind, though the opportunities for study are delightful, there is obviously something wanting in the whole system. Every preparation is made for the student to obtain knowledge, yet the result is by no means as satisfactory as might be expected. Does not this arise primarily from the student starting fresh from school without any previous elementary practical knowledge of construction? He has never been on a building in the course of erection, and does not know the difference between a piece of oak and a piece of deal. Neither, owing to his not having seen an actual moulding cut, has he any idea of the method of its production. For four long years he spends nearly the whole of his time in theoretical study, and as far as my own experience goes, there are but few men who utilise even the smallest part of their leisure in getting some idea of the nature of practical work. Does not a school where merely the theory of architecture is taught have a tendency to produce an architect of an academic character, though, of course, there may be the usual exceptions of brilliant and talented men, or those who are ambitious and energetic, and who do not follow the lines laid down for them? Do not many of the masters, too, in such a school, soon lose all touch with practical work, and though brilliant scientists or historians, on receiving their professorship, do they not lose all sympathy with the movement of the times, and even by going through the same course regularly year after year, become mechanical and uninteresting in their methods, inspiring no enthusiasm in their pupils whatever? I think there can be little doubt that, just as it is at Berlin, for instance, the best and most popular masters are those few who keep in constant touch with current thought and practice. As to the remedy for any unsatisfactory results, would it not be advisable that a boy should have a whole year's practical work in an office with the run of

some works for at least six months before he starts his elementary studies at the college, and should not every six months of theoretical study be interspersed with three months of practical work? Should not lessons in design be accompanied by lessons in the measurement of existing buildings to enable the student to grasp the appearance of what he is putting on paper? Would it not be well, too, that the instructors in design, construction, and special equipment, should one and all be men actually in extensive practice, and that such subjects as history, the elementary sciences, and freehand drawings, should be left to men whose vocation is chiefly to impart knowledge yet who should be compelled to keep themselves abreast of modern progress? We have had under consideration an establishment organised on the most elaborate lines, in which there is but little left to improve, as far as the syllabus of the classes is concerned. The Berlin Technical College has been on its trial for over twelve years, and the results, to my mind, are not at all proportionate to the amount of time and money expended by the architectural student and the Prussian Government. Indeed, as the Berlin Technical College is in many respects a model to those advocating architectural education, so it must also serve as a warning to those extremists who would advocate merely theoretic study as the primary basis of a training in architecture and its actual practice. Much as we can learn from leading men in special technical subjects, the Berlin College only too plainly shows what harm can be done by taking an able man entirely away from his profession, and thus preventing him from keeping in touch with that practical work which brought him into prominence. I would conclude by saying that the architectural school at the Royal Technical College of Berlin is an institution well worthy of our attention, and in many respects of our imitation; but, at the same time, we must observe the disadvantages of too theoretical an education, and their evil effect upon a student destined for actual practice. What I have said in regard to the architectural school, I believe, holds good in many respects for the several engineering divisions of the same college.

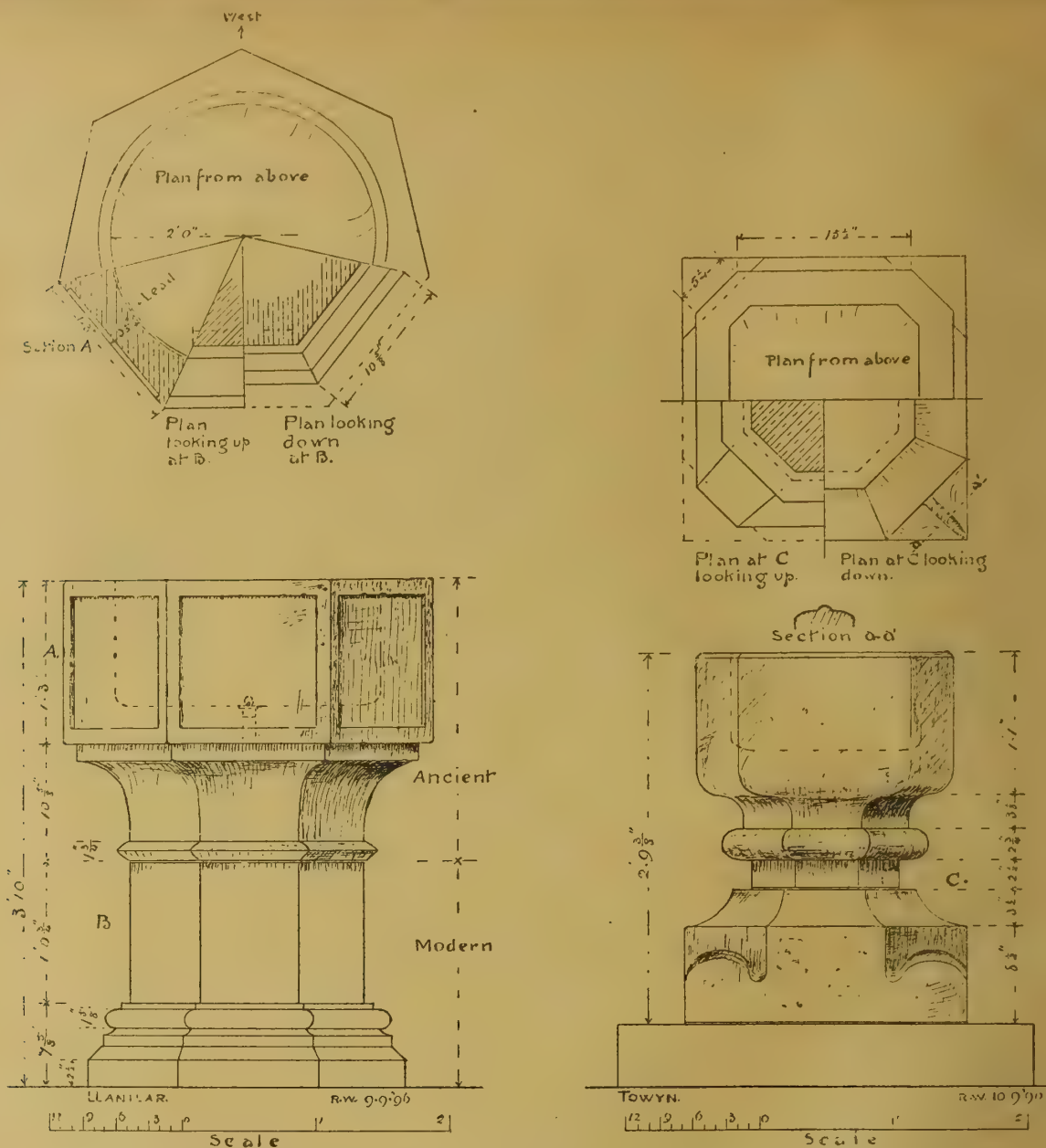
#### "DONNYBROOK," ASHLEY HEATH, CHESHIRE.

THIS house has recently been erected for Mr. Walter Ibbotson on a charming site overlooking the river Bollin. It is built of Ruabon bricks; the timber framing in the upper story and the windows are of Californian redwood. The plan has been so arranged that the billiard-room is brought into communication with the drawing-room by a raised platform or snugery, by this means also giving additional height to the billiard-room, part of which has an open-timbered roof. The contractor for the work was Mr. A. F. Fox, of Peel-causeway, near Manchester. The whole of the work has been carried out from the designs and under the superintendence of Mr. Wm. Owen, A.R.I.B.A., of 134, Deansgate, Manchester.

#### MODERN HIGH OFFICE BUILDINGS.

A DISCUSSION was opened recently at the Engineers' Club of Philadelphia, by Mr. Charles Christie on the above subject. He understood the subject to mean buildings in which the construction was essentially metallic overlaid with other materials. The modern office building has gone through a state of evolution, and reached the condition of "definite coherent heterogeneity." In discussing the subject, all parts of the building, from the foundation to the roof, should be considered, including the elevators, heating, lighting, &c. Regarding foundations, the nature of the soil is very important, and different methods of treatment are necessary to adapt it to the load to be supported. Building laws should not only provide for the load to be supported in different soils, but should also consider the sub-soil. Soil of variable character should be made uniform to secure equal settlement. In the superstructure, the first element to be considered is the metallic column which carries the other parts. The columns should be of malleable metal to support the bending strains, which are not always capable of strict analysis, as they come from many different causes. The strength of columns is threatened by the liability





CAMBRIAN ARCHÆOLOGICAL ASSOCIATION EXCURSION, 1896.

Some Fonts Measured and Drawn by ROBERT WILLIAMS, F.R.I.B.A.

to corrosion, which is not very great on the interior, but becomes quite important just inside of the casing walls. The columns should always be treated to prevent this danger, and probably the best way would be to inclose them and to fill the inside with concrete. Component parts should be rigidly fastened, so that strains may be evenly distributed. Floors should be of fireproof construction, and for this purpose brick arches of short spans have been superseded by lighter hollow tiles of longer span. The roof is probably next important to the foundations, for it serves not only as a cover, but as an essential to the bracing of the building. The partitions in most buildings are dependent upon the openings required for windows and doors, but if well planned they can become important braces, and should generally be of a cellular web construction. The curtain or outside wall is carried by each floor as a veneer over the iron work, but it should be strong enough to stand any lateral vibration. The inside work (including lighting, heating, and ventilation) was passed over as being common to all large buildings. The elevator has grown with the modern office building, of which it is a necessary feature. It should be quick, strong, and guarded against accident by the best safety devices.

Mr. Joseph T. Richards: The foundations of Broad-street station were criticised as being unnecessarily broad and heavy, but they have resulted in supporting that large building without any settlement. In the stone arch bridges of the Pennsylvania Railroad we find that if the founda-

tions are good the arch is very durable. Most old arches with rubble masonry foundations are still intact, while with foundations of cut stone, less carefully laid, there has been settlement and sometimes failure of the arch. (Mr. Richards then described, with the aid of a blackboard sketch, the usual foundations for railroad bridges crossing streets in cities.)

Mr. Christie: A few years ago the New York Central R. R. had some failures in good bridges, on account of poor foundations, especially in abutment walls. It is found that the stability of railroad bridges is increased by giving them heavier floors, which are better able to resist the impact of moving trains.

Mr. Arthur Falkensau: In the foundations for modern office buildings the requirements are peculiar on account of the narrowness of the base in proportion to the height of the structure. In New York City, in some cases, they have resorted to pilings of iron pipe filled with concrete. In another instance a building, twenty-six stories high, is supported on jacks, by which any settlement of the foundation can be compensated. A very strong foundation can be made of pipe driven to bed rock in short sections screwed together. Difficulties are often encountered in digging for foundations, or in underpinning, on account of the soil spreading into the excavations from under adjacent buildings, so that in some instances it has been necessary to close it in with cement.

Prof. W. L. Webb: A discussion of modern foundations would be incomplete without allusion

to pneumatic foundations, as used under the Manhattan Building in New York City. These foundations have advantages in soft soil, and can be used where almost every other method fails, especially in concentrated areas.

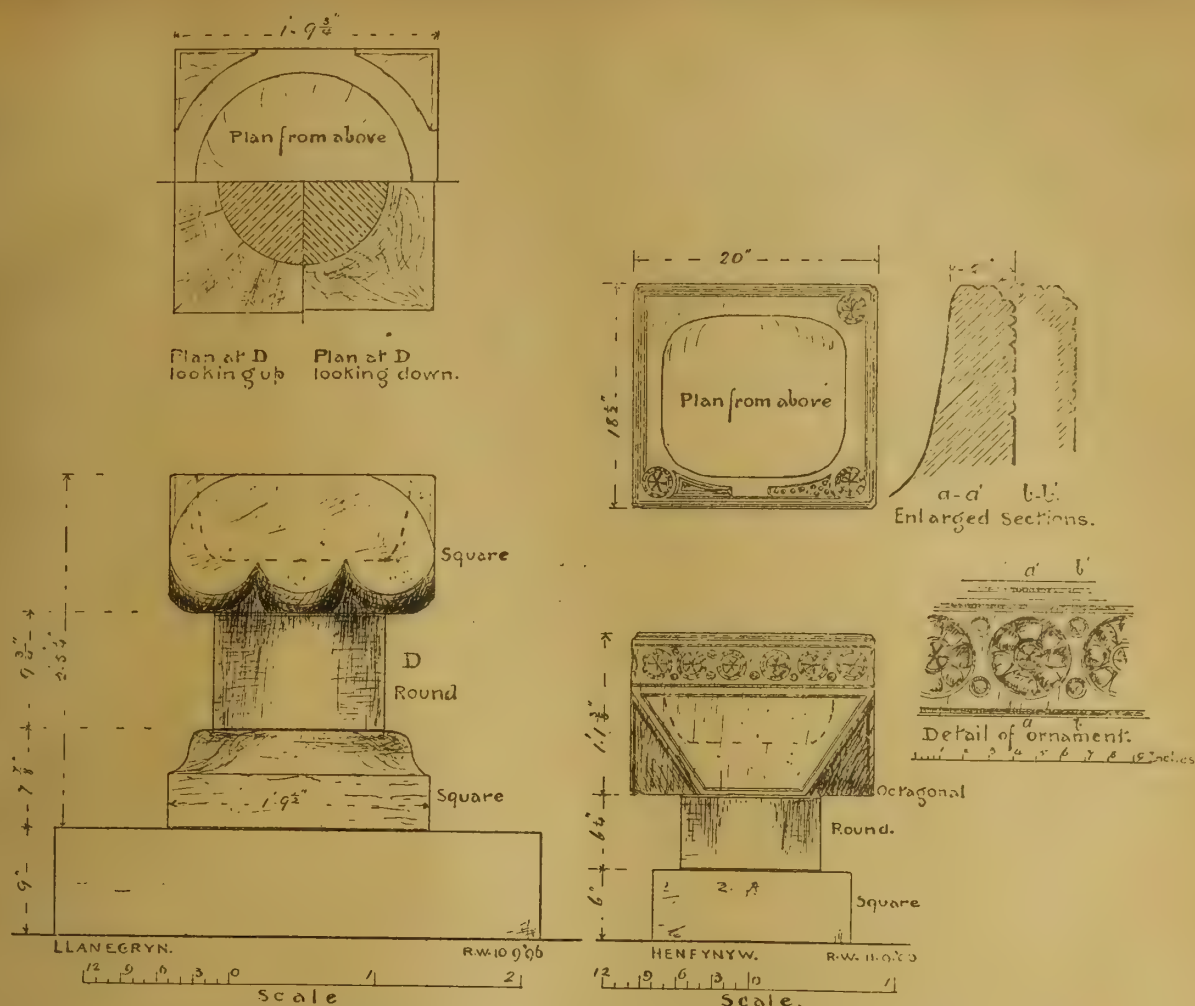
Mr. E. F. Miller: I have found that the water under ash-filled ground is generally of a very alkaline character, and while I know that this will improve wood, I suspect that it would be harmful to metal construction.

Mr. E. M. Nichols: It would probably be very injurious to iron.

Mr. Richards: I recall a case in our practice where, as rock foundation was 100ft. below the surface, wooden piles were driven to an intermediate stratum of sand. They were then cut off 3ft. below surface, capped with timbers and buildings erected upon them, which have stood remarkably well.

Mr. Nichols: Any building is uncertain on soil of uneven character, but if the foundations are made as rigid as possible, and the building is well braced, it will be permanent. As the modern office building is a very large subject, I think it would be a good plan for the club to discuss the different features enumerated by Mr. Christie at different meetings. Lateral bracing, though very important, is often inadequate. I recall instances in Chicago where heavy winds prevent tenants opening the doors of their office vaults, or cause vibration like that due to printing-presses. In the old post-office of Chicago I think the trouble was caused by failure of the inner foundations, which resulted in uneven settlement of the walls.





## CAMBRIAN ARCHÆOLOGICAL ASSOCIATION EXCURSION, 1896.

Some Fonts Measured and Drawn by ROBERT WILLIAMS, F.R.I.B.A.

Mr. Wm. C. L. Eglin: In the building of the Edison Electric Light Company, of this city, the excavation was dug to a gravel bed, which was covered with concrete to a depth of from four to thirteen feet. The engines were mounted on concrete monoliths, separated from the wall foundations by sand, to prevent transmitted vibrations.

Special examples of foundations were cited by Messrs. J. S. Merritt, H. Y. Loss, and E. M. Nichols, and Mr. Christie called attention to the character of deflection in columns eccentrically loaded.

## SOME WELSH FONTS.

THE font at Llamlar, Cardiganshire, is one of the few seven-sided fonts, eight-sided being the ancient orthodox form, as representing—according to Durandus—regeneration. Each of the seven sides of the bowl has sinkings, which may have contained metal plaques or tiles.

Towyn, Merionethshire.—This is a rectangular font, with the corners canted. A member between the base and shaft at point C is evidently missing.

Llanegryn, Merionethshire.—The bowl of this font is a peculiar adaptation of a Norman cushion capital; the shaft is round, and the stonemason was at considerable pains to adapt his moulding from the round to the square.

Henfynyw, Cardiganshire.—This font is not now at Henfynyw Church, but stands useless in the porch of Aberayron Church. It is, perhaps, the most interesting of the whole, its craftsman having attempted a little ornament. Neither the round shaft nor the square base belongs to it. The original base was octagonal, as the bowl in its bold change from the rectangular to the octagonal clearly shows.

These fonts are very simple and plain, but they have existed in these remote churches for many centuries, and the stone out of which they were axed and chiselled came probably from across the Channel.

ROBERT WILLIAMS.

## OSCILLATIONS OF A TOWER.

PROFESSOR W. RITTER gives, in the *Schweizerische Bauzeitung* of February 13, the results of his experiments on the oscillations of a tower in Zurich produced by the ringing of bells, says the *Railway Gazette*. The tower, which is 39½ metres high, contains five bells, ranging in weight from 425 to 3,430 kilogrammes, and it is remarkable that the light bells produced greater oscillations of the tower than the heavy ones. The horizontal oscillations were elliptical in shape and variable in size, those produced by a bell of 705 kilogrammes, which was swung 53 times per minute, being at a maximum 3.6mm. long and 2.4mm. wide, the longest axis being in the direction of the movement of the bell. When the five bells were rung at once the ellipse had a maximum major axis of 5.8 and a minor axis of 4.4mm. The bells were swung from 43 to 57 times per minute, while the tower oscillated quite uniformly 160 times per minute. It was shown that the oscillations were felt at any point in the tower below the bells, and that the amount of movement was proportional to the height above the ground. According to the principle of the conservation of centre of gravity the tower tends to move in the opposite direction to that of the bell, and this movement increases until the resistance of the masonry produces equilibrium with the impulsive forces.

## SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, June 14, Mr. G. Maxwell Lawford, president, in the chair, a paper was read by Professor Herbert W. Umney, Assoc.M.Inst.C.E., entitled "The Compression of Air by the Direct Action of Water." The author, by way of introduction, referred to the importance of obtaining compressed air by the simplest possible means. In particular, he called attention to the best of all methods, being the only one whereby the compression takes place

isothermally. The idea, however, he observed, was not a new one. He referred to the ancient methods in use in Spain, and stated the general principle underlying the system. He then directed special attention to the plant erected by Mr. Frizel, of New York, which gave an efficiency of 52 per cent. when tested. He stated that an abstract of these experiments was recorded in the *Proceedings of the Institution of Civil Engineers* in 1880. The author then described a plant which has recently been erected by Mr. Taylor, of Montreal, giving an increased efficiency of 10 per cent. He gave in detail the method of impregnating the water with minute bubbles of air, the improvement being entirely due to this feature, and pointed out the alterations necessary, being confident of obtaining 75 per cent. of the power at command. He also gave records of the trials conducted, and has computed the various hydraulic losses in the apparatus. He summarised the advantages of adopting this principle as follows:—(1) The compression takes place isothermally; (2) the initial outlay, repairs and working expenses are less than by any other means; (3) it is suitable for adoption in the case of low waterfalls. He claimed that these far outweighed the objections of sinking a shaft.

## SCHOOL PLANNING.

AT the annual Conference of Clerks to School Boards, held at Manchester on Thursday in last week, a paper on "School Planning" was read by Mr. J. Rennie, of Oldham, in which he observed that the questions to be decided as preliminary to the preparation of plans for the erection of a new school were the number of scholars for whom it was necessary to furnish accommodation, the number of departments, the number of classrooms, and other special rooms. One important and essential matter in the planning of all schools ought to be kept in view—that the internal arrangements should be as compact as possible, avoiding waste, and thereby resulting in economical building; and in determining the plan the



annual working expenses of maintenance, teaching, warming, and ventilation should also be kept in view. Importance was also attached by Mr. Rennie to the placing of the school as to site. Given a plot of sufficient dimensions, he preferred a school of one story only, as lending itself to better lighting, ventilation, heating, and cleanliness than others. They knew that the central hall type of school was a development of late years. In his view the best type of school was one built on the central hall plan. Although, technically speaking, a hall was not counted, except for a class, it could be used for a variety of purposes connected with the work of the school—the opening and dismissal of the school, and the healthful and bright drill exercises as seen in some large schools. These could not be carried out to the same advantage in an ordinary type of school. Next in his preference was the two-storied building. In the latter part of his paper Mr. Rennie urged that the regulations laid down by the Education Department ought to be more elastic, and larger discretion might, he said, well be left to local authorities, particularly in the case of large boards, which had had considerable experience in school-planning, and were far better acquainted with local needs and difficulties than any central authority could be. In the course of a discussion which followed, the Hon. E. Lyulph Stanley, member of the London School Board, remarked that there had been no great improvement introduced into school-planning since the central hall. He thought there ought to be more elasticity in the regulations as to the size of classrooms, which should vary in size according to their experience as to the numbers in the classes.

#### WROUGHT IRON AND STEEL IN CONSTRUCTIONAL WORK.—XX.

SINCE the essential difference between a column and a beam is this: that the column is subject to end pressure and the beam to trans-

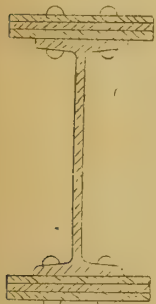


Fig. 96.

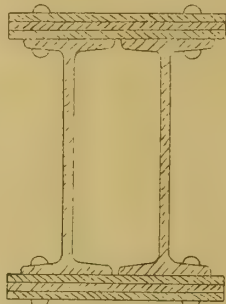


Fig. 97.

verse loading, and also that a long column fails similarly to a beam, it follows that many of the sections used for columns are also conveniently employed for beams; nearly all the commoner sections previously illustrated are thus used.

Confining the remarks in the present paper to sectional forms only, the typical beam is the rectangular section set with its wider dimension depthwise; but rectangular sections are seldom used, except when timber is the material employed. In iron beams it is easy to remove material from the vicinity of the neutral axis, and to mass it at and near the top and bottom edges as flanges; hence the rolled joist is a type of the girder, and is a favourite and cheap form for short spans. It is obviously derived from the cast-iron double-flanged girder which preceded it, and from it have followed the deeper and longer built-up girders, both plated and lattice braced.

Within rather narrow limits the joist affords a cheaper and better beam than any other. It can be used single, or in a large number of combinations; but it is useless for long spans, and the stage is soon reached when building up compound beams with joists and plates becomes as costly as building up a girder of better design, in which the material can be distributed most economically.

The elements of the joist are the two flanges and the connecting web. The first are subjected to the maximum of tensile, compressive, and lateral stresses; the second in but a slight degree only, beyond the stiffness afforded by depth, the stresses becoming nil on the neutral plane; the strength of the single joist is dependent much

more upon depth than on breadth, and much more on the mass of metal in the flanges than on that in the web. There are several ways, therefore, of increasing or multiplying the strength afforded by a single joist. The flanges may be thickened and widened by the riveting on of plates, as in Fig. 57, p. 588; one, two,

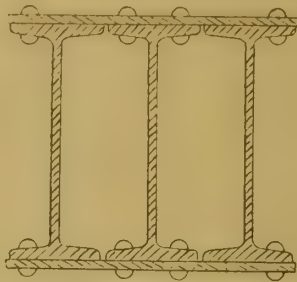


Fig. 98.

or more plates being added, as in Fig. 96, so increasing the strength of the flanges simply; or, if head room permits, a deep joist may be selected in preference to a shallow one, the flanges being of equal width; or joists may be riveted flange to flange, one above another. But, with increase in depth, without corresponding increase in width of flanges, there arises a tendency to buckling or crumpling sideways, due to the fact that stresses are liable to come on in a direction not perpendicularly, putting the beam into a condition somewhat akin to that of a long column which yields by flexure. To guard against this two joists or more may be connected together by means of top plates, or of top and bottom plates riveted through the flanges, as in Fig. 45, p. 449. Increased strength may still be imparted to the latter by doubling or trebling the number of plates as in Fig. 97; or, for wide shallow girders, three joists are often riveted together by means of plates, as in Fig. 98, the plates being doubled or trebled when necessary. Finally, two such sets of compound girders can be riveted together depthwise, so attaining the maximum strength economically possible with rolled joists. The result is a very heavy beam of short span, parallel in each direction, in which the metal is not distributed in the best possible way, and which, in the duplicated forms, is closed up; the latter, however, is not nearly so objectionable in the case of stout joists as in that of thin plates and angles, with numerous rivet-holes. It follows, therefore, that the use of the rolled joist as a beam is practically almost limited to the support of warehouse floors, walls over shop-fronts, the short deck-beams of bridges, and including, in many cases, the struts and ties in lattice bridges, the first of which are often calculated to fail as beams or long columns.

The next stage in the development of the beam is the building up of the plated form with web-plate, flanges, and angles, Fig. 99; formerly, in the early days of wrought-iron construction, nearly all girders of large span were built up on this principle. It has the advantage over the



Fig. 99.

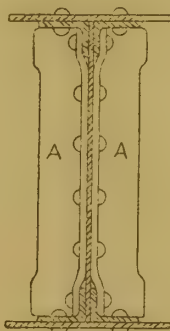


Fig. 100.

joist of permitting the engineer to choose his scantlings to the very best advantage; it is cheaply constructed, and no very exact calculations are required as to the precise intensities of the stresses in different localities, as in the case of braced beams. Still, it is used less and less by

engineers, even for girders of moderate dimensions. A variation in the form of the plate-girder occurs in the struts of some bridges in which one angle only is used on each flange, or in which a zed or two zeds are employed to connect the flange plates.

The strength of a plate girder can be increased by thickening the flanges or by increasing the depth and width. The number of plate thicknesses in a flange is not increased uniformly along the whole length, but only in a degree corresponding with the stresses; so that, while at the ends there may be but one thickness, the number may increase to five or six as the location of greatest stress in the centre or elsewhere is reached.

As regards depth, there is a usual ratio of

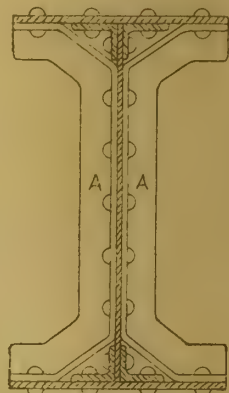


Fig. 101.

depth to span adopted when practicable, viz., depth  $\frac{1}{16}$ th to  $\frac{1}{8}$ th of span; but as the depth increases, the crippling stresses increase too, and therefore plate-girders have their webs reinforced with vertical stiffeners. These are riveted on at distances apart about approximately equal to the depth of girder; they consist of angles or of tees, preferably of the latter. Three methods of fitting are shown in Figs. 100-102. In the first the angle or tee stiffeners, A A, are simply "set" or "joggled" over the longitudinal angles; in the second, Fig. 101, they are bent to clear the longitudinal angles bodily; in the third, Fig. 102, they are neither joggled nor

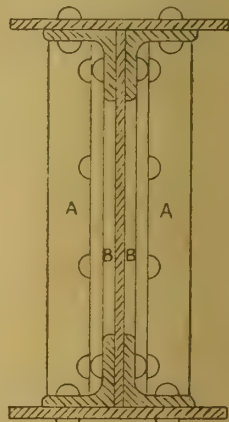


Fig. 102.

bent outwards, but are laid against and riveted through packing strips, B B, of the same width, or just a trifle wider, than the stiffeners, and of the same thickness as the angles. Fig. 100 is the cheapest and least desirable method, and is not suitable for girders with wide flanges. Wide flanges are necessary to afford resistance to side stresses, and it is usual to make these roughly equal to about  $\frac{1}{16}$ th of the distance between abutments when the load is a dead load; on braced work about  $\frac{1}{8}$ th is taken. The stiffeners, A A, in Fig. 101, should come out nearly or quite to the edges of the flanges. The method in Fig. 102, of using packing pieces, is generally followed in deep girders; it saves the cost of joggling at the expense of a little extra material, and the packing adds to the stiffness of the beams.

The strength of plate-girders may be multiplied by combining two into the box form, with



plates at top and bottom, Fig. 103; this a practice which is not now regarded with so much favour as formerly. The strength is not calculated as doubled, owing to the possibility of stress not being equally distributed: this is a development

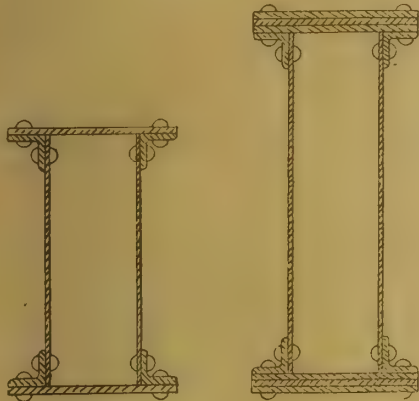


FIG. 103.

FIG. 104.

from the compound girder formed of two channels and two plates, also used as a column, shown in Fig. 60, p. 589. The strength of the flanges is increased by increasing the thicknesses and widths of the connecting angles, and by multiplying the number of separate plates in the flanges, as in Fig. 104; stiffeners are still retained,

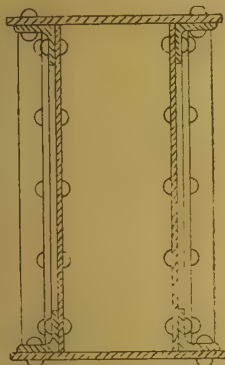


FIG. 105.

Fig. 105, and, if the plates are far apart, stiffening diaphragms are inserted at intervals.

The objection to closing up the girders is sometimes obviated by connecting one pair of flanges only by a plate and uniting those on the side opposite, whether top or bottom, with horizontal

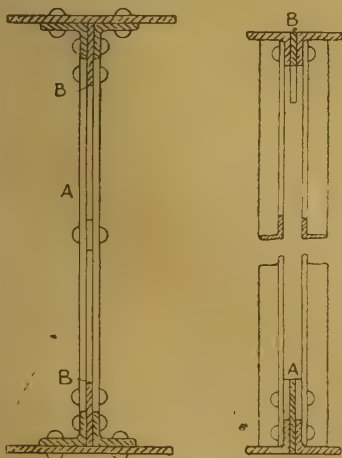


FIG. 106.

FIG. 107.

diagonal bracing, or with short pieces of plate at intervals, as with pillars.

From the plate-girder, whether single or double-webbed to the lattice or braced-girder, is a natural transition; dividing a girder into a number of short bays of a few feet in length each, the nature of the stresses in each particular

bay and their precise intensity can be determined. By means of systems of triangulation the localised stresses can be apportioned to members in tension and to those in compression, or to members subjected alternately to both kinds of stress; the forms given to such girders are numerous. Confining the present remarks to their sections only:—They are composed of a single series of bracing only, Fig. 106, the bracing A being riveted to narrow web-plates B B. Occasionally a wide-flanged tee is used instead of two angles, the wide flange being riveted to the top and bottom plates, and the narrow flange fulfilling the part of the web-plates B B. Fig. 107 represents another method, which has the merit of cheapness. The top and bottom flanges are formed of two angles, placed back to back, with packing between; the

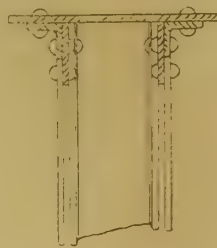


FIG. 108.

struts and ties are formed of angles. The reason why packings are inserted between the flange-angles is to permit of the insertion of deep gusset plates A, wherever required for the secure attachment of the bracing angles. The packings B between gussets simply fill up the open spaces not occupied by gussets, and receive the rivets which unite the flange angles.

These are methods chiefly adopted in the smaller braced girders; more generally, there are double systems of bracing used in large girders, as in Fig. 108, two narrow web-plates being riveted to each flange to receive the bracing. This construction, therefore, corresponds with the box-girder in its essential elements; but bracing is substituted for continuous web-plates. In the case of deep girders of this general section it is necessary to introduce vertical stiffeners as in box girders; these are riveted on the outside, or on the inside between the bracing. Tees and angles are used in the first case, and joists and channels in the second, as shown.

The method of construction shown in the last, Fig. 108, though perhaps the most common, is not to be considered as a necessary one. There are many departures in detail therefrom, other methods of union and other sections being adopted for specific reasons. J. H.

#### FIREPROOF FLOOR TESTING.

AN important series of experimental tests have been going on in New York City on various forms of fireproof floors and other structures, subjected to the effects of fire and water, heavy loading, &c., under the Building Department of that city. The promoters of fireproof floor systems have built samples of their work in a practical manner, and with ordinary materials. The "Metropolitan" floor system was officially tested in the presence of the fireproofing company's officers and representatives of the Building and Fire departments, engineers and architects. This floor consists of a composition of 75 per cent. by weight of plaster of Paris and 25 per cent. of wood chips or sawdust surrounding steel beams and forming floor-plates between them, like monolithic slabs. These contain a series of suspended cables, fastened to the top flanges of the beams by hooks, and are about 1½ in. apart, deflecting about 2½ in., each composed of two No. 12 galvanised steel wires twisted together, so

as to get a grip on the body of the plate of plaster and reinforce it by their tensile strength. The flange and web of beams are protected in moulds of light wire netting. The ceiling is separate and independent of the floor, allowing air-spaces between the lower webs and flanges of beams. The ceiling is of mortar plastered on Roebling No. 20 wire netting, and attached to ½ in. square transverse bars 16 in. apart, supported on the lower flanges of beams. The floor was filled in above with a 2 in. bed of Portland cement concrete (cinders, sand, and cement) with nailing strips. The solid part under the cinder concrete was 4 in. thick, standing ½ in. above tops of floor-beam flanges, and weighed about 25 lb. per square foot. This floor was loaded with 150 lb. per square foot of pig-iron uniformly distributed. According to the *Engineering Record*, from which we give these particulars, this floor and an ordinary standard tile floor were both tested by fires lighted in the cells, and were quenched five hours after by streams of water, and both floors were found to be intact. The impact of water on the ceiling of the Metropolitan floor caused the ceiling to be destroyed; but this was the only damage. Full particulars and illustrations of the test are given in our contemporary.

#### CALIFORNIAN REDWOOD.

MR. WARBURTON, the British Consul-General in San Francisco, draws attention, in his last report on the State of California, to the merits of the redwood grown there, and extensively used for building and decorative purposes. Redwood is the *Sequoia sempervirens*, the great tree of the coast-belt of California. It attains a height of 250 ft. or more, and, it is said, a girth of 60 ft. The Consul-General has measured some trees 45 ft. in circumference between 4 ft. and 5 ft. from the ground, but these were not in the finest groves. The wood is said to stand any climate, from the dry heat of Australia or the interior of California to the dampest climate, without being affected, after it has been thoroughly seasoned. The chief objection to its use is the difficulty of seasoning it. A board 6 in. thick will not thoroughly season in the warmest part of California under about two or two and a half years. This, of course, adds to the cost. Much of the wood is exceedingly handsome for internal use and decorative purposes, such as doors, panelling of rooms and ceilings, dados, mantelpieces, and overmantels, &c., and once properly seasoned it never shrinks or cracks. Mr. Warburton carefully examined rooms the walls and ceilings of which were entirely panelled with it, as well as many doors, and has not been able to detect a crack. Another advantage is that boards of great width can be obtained entirely free from knots. In colour the wood ranges from light to dark reddish brown. The varieties of graining are great. Some, especially the "curly" and the "burl," are very beautiful. The "curly" has a wavy pattern. The "burl," in its markings, is something like Thuja wood, but with larger markings, English oak "burr," and the finest knot walnut. This wood, however, except the "burl," is soft and liable to be marked by blows. When properly prepared it takes polish and varnish well. Certain articles of furniture, such as tables, are made from the "burl." The timber has been of late shipped to the United Kingdom, the annual shipment from San Francisco being about 7,000,000 ft. or 8,000,000 ft. But much of what has been sent to England has been of a very inferior quality, so that buyers at home must not judge of the quality of the timber by inferior specimens they may have seen. The price in San Francisco just now is about £3 10s. per 1,000 ft. f.o.b.

#### THE POSITION OF CHOIR AND ORGAN IN CHURCHES.

MR. W. D. CAROE, F.S.A., the architect to the Ecclesiastical Commissioners, writes as follows in yesterday's *Times*, in reply to the Bishop of Chester's letter, which we gave last week, p. 841:—

The document from which the Bishop quotes is a very familiar one; but the cloudiness of its conclusions and the absolute impossibility of their application in many instances render it comparatively useless except as a basis for further discussion. Neither does this document nor the





Bishop's letter touch upon one aspect of the question to which, in these days, a great many of the surrounding difficulties may be traced; I allude to the frequent "monstrosity" of the modern organ, using the term in its fullest sense. It is more often than not that the organist and organ-builder can think of nothing but the magnifying each of his office, and the result is a prodigious erection quite incommensurate with the musical needs of the church, out of harmony and scale with its proportions. Too frequently it is planted down to hide from view, if not actually to destroy, some object of beauty or antiquarian interest—a burden not only upon the edifice which it defaces, but upon the parishioners who have to pay for it. The sufficiency of the 8ft. harmonic pipe cannot be sufficiently urged instead of the 16ft. open—such a disastrous introduction into most churches of moderate dimensions not originally constructed for it. A clever French organ-builder once remarked to me in discussing this question, "You English are so fond of roast beef." If the York Committee will give its attention to the size of organs as well as to their disposition, and circulate some authoritative statement tending to curb the exaggerated notions of organists, they will be helping "the adoption of more suitable arrangements for musical purposes" not a little, and secure the avoidance of much needless injury to many an ancient edifice. Even if commensurate in size to its surroundings, the organ is one of the most important, as it must be one of the most prominent, of church fittings. Its construction is such that it can adapt itself readily to the highest and best of artistic treatments—that of suitability and fitness not only to its environment, but to a proper expression of itself and its uses. Yet in most cases it succeeds in being the most ill-designed and generally the most vulgar erection imaginable. One point may be mentioned in reference to the much-abused organ chamber. If the organ is too powerful for the church, or too raw and blatant in tone, the best thing that can be done with it is to put it away in a properly-designed chamber, which, after all, is only after the manner of a swell-box in another form. The construction of the organ-chamber or "place," if the term be preferred, is thus also deserving of the York Committee's attention.

#### HOUSES, DOWNLEAZE ESTATE, SNEYD PARK, BRISTOL.

THESE houses have recently been erected in a new road adjoining the well-known Downs, and are built of native blue-grey stone, the roofs being covered with Broseley tiles. Messrs. Walters and Son are the builders, the architect being Mr. H. Dare Bryan, of College-green, Bristol. Each pair of houses in the road differ in design, whilst conforming to one general style, a distinct improvement on the too-prevalent monotony of the ordinary suburban road.

#### BOOKS RECEIVED.

*Fires and Public Entertainments*, by EDWIN O. SACHS, architect, Fellow of the Royal Statistical Society, author of "Modern Opera Houses and Theatres," &c. (London: Charles and Edwin Layton, Farringdon-street), is a large folio volume giving a "study of some 1,100 notable fires, at theatres, circus buildings, music halls, and temporary structures during the last 100 years" in tabular form, the date, town, name of building, and particulars being recorded in separate columns, that will possess some special interest just now. Mr. Sachs has evidently been impressed with the calamitous fire at the Charity Bazaar in Paris in May last, and this sad event has evidently given a *raison d'être* for such a work. Though many alterations tending to the reduction of the risks in theatres have been made, circus buildings, concert and assembly-rooms have not yet been much improved. Mr. Sachs's compilation will be of value to authorities and all promoters of entertainments in helping them to bring about a better condition of things. He acknowledges the researches in this field of inquiry made by the late August Foelsch, of Vienna, and tenders his thanks to fire brigade and police officials throughout Europe for information. The Paris catastrophe, which originated this work, is first accurately described, and plans and details of the temporary wooden structure are given, and will be found of much interest in this connection; they form an appropriate study as an introduction to Mr. Edwin O. Sachs's work. The analysis given of fires, and the life of buildings is useful, according to which the average life of a theatre, music-hall,

&c., based on 343 instances, is 18.3 years, but this calculation is considered optimistic.—*The Engineering Magazine*, June, edited by JOHN R. DUNLOP and CHARLES B. GOING (London: George Tucker, Salisbury-court). The June number of this magazine contains an article by M. J. C. Charpentier on "The Importance of the Universal Exposition of 1900," a project now on the carpet, and the preparations for which are now being made in France. Temporary scaffoldings of the Pont Alexander III. already stretch across the Seine and a large part of the Palais de l'Industrie, which sheltered the victims in the recent Bazaar fire, has been removed. Committees are also being formed in all European countries. "Electricity in the Modern Machine Shop," by Louis Bell, and "Engineering Problems of the Tall Building," by G. H. Stockbridge, are other articles of some interest. The latter article is illustrated by various tall structures; but there is nothing very new in the suggestions. The author thinks that the metal frame of these buildings is best enveloped in Portland cement masonry. No hollow spaces should remain in columns and girders.

Mr. W. W. Carr, who was a member of the Executive Council under the "old" constitution which in 1893 gave place to responsible government in the colony of Natal, has been appointed by the Government of the latter inspecting and consulting engineer in London for the Government railways, of which he is at present engineer-in-chief.

The Lord Commissioners of her Majesty's Treasury have appointed the following gentlemen to be Trustees of the National Gallery:—The Earl Brownlow, to succeed the late Lord Savile; and Mr. Henry Tate and Mr. John Murray Scott to newly-created Trusteeships.

It is intended to carry out alterations and improvements in the parish church at Freemantle, and the plans have been prepared by Mr. Sidney Kelway Pope, of Southampton, honorary architect. The work is to be carried out by Messrs. Wheeler and Sons, Reading, at a cost of £350. The choir and clergy stalls are to be replaced with carved oak, in lieu of the present material, the pulpit is to be shifted, the front of the choir stalls are to be relaid, the wooden rail at the communion is to give place to one of brass, and the approach to the communion is to be raised.



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## ILLUSTRATIONS.

SELECTED DESIGN FOR THE NEW CITY HALL, BELFAST.—  
LACOCK CHURCH, WILTS.—JUBILEE SKETCHES.—HOUSES,  
SNEYD PARK, BRISTOL.—DOORWAY, LLANBADARN FAWR  
CHURCH.—"DONNYBROOK," ASHLEY HEATH, CHESHIRE.

## Our Illustrations.

## BELFAST TOWN HALL: SELECTED DESIGN.

We illustrate to-day the chosen plans for the Belfast City Hall, by Messrs. Edward Thomas and Son, whose design was selected in the late competition, in which three plans preferred from the original fifty-one designs were alone considered for the final award. The site is at present a public garden, and was occupied until comparatively recently by the old Linen Hall, which was removed with the view of forming a site for a new city hall. The block plan accompanying the view of the intended façade shows exactly how the building is to occupy the site. Only a portion of the land, of course, will be covered, and the remainder will be retained as gardens. The principal front faces the main street of Belfast, which runs northward from the centre of the north side of the square. The dominating feature of this façade is designed within the limit of view obtained from any point in the principal street, which extends for a considerable distance from the square. The building is accessible both from the garden and by way of the drive at the back, and the point of approach to the building is centralised by the principal entrance hall under the dome. Subsidiary entrances to the offices are distributed at the south angles of the quadrangle. The gas and rates departments are contrived to be accessible directly from the quadrangle without traversing the corridors of the building. The arrangement of the principal rooms, including the public hall, on the first floor is planned so that for the purpose of municipal functions they will form a suite of reception rooms. The arrangement also permits the public hall and its approaches, together with the refreshment-room, being separated from the municipal portion of the building, in order that they may be let for public purposes. The probable cost is stated at £150,000. The accompanying drawings show both the principal plans, the chief apartments and hall being on the first-floor level. The two main façades and that on the west side are given, as well as a cross section through the great quadrangle and grand entrance, as also the dome surmounting the whole. We shall illustrate the second premiated design for the same building next week.

## LACOCK CHURCH, WILTS.

FROM the architect's drawing, now at the Royal Academy, we illustrate to-day the proposed new memorial chancel to this most interesting church, which stands in the old stone-built village close by Lacock Abbey.\* The chancel is to be remodelled in memory of W. H. Fox Talbot,

\* Illustrated fully in the BUILDING NEWS for July 21, 1893.

LL.D., F.R.S., the inventor of photography, who died in 1877, just one hundred years after the rebuilding of the ancient chancel of the parish church. This 18th-century erection is out of harmony and incongruous with the remainder of the church, and, to render it more in keeping, Mr. Harold Brakspear, A.R.I.B.A., of Corsham, has been employed as the architect for the present undertaking; the new work will be in local rubble and Bath stone dressings, with a red tile roof. Inside the open timber construction will be in pitch-pine. The floor will be in encaustic tiles. The cost will be about £1,000. Fox Talbot was born in 1800. In 1834, by the aid of a camera lucida, followed by the experiments with a camera obscura, he evolved the idea of photography, and in 1835 took photographs of Lacock Abbey. In January, 1839, the discovery of the daguerreotype was announced, the process being kept secret. Fox Talbot then saw that he had missed his opportunity of announcing an entirely new art, and that he ran some apparent risk of losing the credit of his own discoveries. His photographs on paper, which he called "Photogenic Drawings," were therefore exhibited at the Royal Institution on the 25th of January, 1839, and the discovery was announced by Faraday at the same time, with the object of fixing a date in order to avoid any charge of imitation in the event of the process proving to be similar to Daguerre's. On the 31st of January, 1839, Fox Talbot's first paper on "Photography," describing the method of producing the "photogenic drawings" was read before the Royal Society, and on the 21st of February in the same year a second paper describing a method of coating paper with chloride of silver, of sensitiveness so much exalted as to render it capable of receiving images in the camera, also a method of fixing by the use of iodide of potassium. The original methods of fixing by converting sensitive into insensitive iodide of silver and sensitive into comparatively insensitive chloride of silver, were afterwards discarded for Sir John Herschel's method of dissolving out the unaltered salts of silver with hyposulphite of soda, which however introduced a fresh difficulty, as the prints, if not effectually washed, were found to fade. On August 18, 1839, Daguerre's process was published, and proved to be quite different from Fox Talbot's. On the 20th and 21st of September, 1840, Fox Talbot discovered the "latent image" and the mode of its development, which changed the whole system of his work in photography, and greatly accelerated the process so that portraits could be easily taken in moderate daylight. The new process was called the Calotype, and the first account of it was communicated to the Royal Society, June 10, 1841. The invention of Fox Talbot contained from the first greater capabilities of development than the invention of Daguerre. The first step was photography by application, the taking of a picture of a superimposed engraving or dried plant. The result was a negative image, from which, by repeating the process, a positive print could be obtained. The pictures taken in the camera were necessarily negatives, and from them positive prints could similarly be obtained. Greatly as photography has been altered and improved since those days, that one step still remains essential and unchanged. Fox Talbot has recorded that it was a fortunate circumstance that he had succeeded in fixing the photographic image before he became aware of the previous experiments of Thomas Wedgwood and Sir Humphry Davy in the same direction, for if he had known that in this matter Davy had met with no success he might have been discouraged from further effort. Many photographs, taken by the Calotype process as far back as 1844, remain in a very perfect state of preservation, but no doubt the great majority have faded. It was probably this fading of the photographs which induced Fox Talbot, at least as early as 1852, if not earlier, to attempt the etching of photographs on metal plates, to be printed from in the ordinary way. He improved on Mungo Ponton's discovery of the photographic use of bichromate of potash by combining the bichromate with isinglass or gelatine and coating the metal plate with a slightly sensitive film of this substance. It was afterwards, when dry, exposed in a frame under a positive photograph, preferably a glass transparency, producing a negative photographic image on the film, which, when treated with a particular etching liquid, resulted in a positive etching of the metal plate from which prints could be struck off; certain precautions and devices were necessary to insure success. This

process he called "photoglyphic engraving," and in 1866 it had been so improved as to give very good results, wanting only uniformity of excellence. In the beauty of some parts these plates have not been surpassed.

## DIAMOND JUBILEE SKETCHES.

THIS clever group of sketches of stands erected for spectators of the great procession next Tuesday has been made by Mr. N. Van der Lyn, of 14, Waldemar-avenue, Fulham. It will be found interesting in connection with an article last week describing these structures.

## CHIPS.

The town council of Blackburn have raised the salary of Mr. S. R. Ogden, their gas engineer, from £350 to £400 a year.

The Felixstowe and Walton Urban District Council have decided to promote a Bill next session for the purchase of the local waterworks undertaking from the private company to whom it belongs.

The town council of Darlington have adopted a recommendation of the gas committee, based on a report by Mr. T. Hawksley, C.E., that a gasholder and tank of a capacity of 1,250,000ft. be constructed, and that tenders be asked for other plant, including engines and buildings. Mr. Hawksley estimated the cost of the gasholder, &c., at £31,100.

Canon Barnett's appeal for funds to enable him to build a permanent art gallery in White-chapel has been so far successful. Mr. J. Passmore Edwards has given £5,000 for the building, and towards the purchase of the land Canon Barnett has received £5,000. Only £1,000 is wanted to enable him to complete the purchase of the site on June 24, and for this he makes a special appeal.

A new bridge connecting Norfolk and Lincolnshire, which has been erected over the River Nene at Sutton Bridge, near Spalding, by the Midland and Great Northern Joint Railways, will be opened for traffic shortly. The bridge is for both road and railway traffic. It is an iron swing bridge, working by hydraulic power, and replaces a bridge erected by Robert Stephenson in 1851, at a cost of £18,000, which had been condemned as unsafe. The contractors are Messrs. Handyside and Co., of Derby. The contract for the bridge alone was £60,000, but this sum has since been increased. The total expense of the bridge and contingent alterations at Sutton Bridge will be about £100,000. The bridge has been just over three years in building.

Belsay Castle, which since the building of the modern hall, the seat of Sir Arthur Middleton, has been mainly used as the steward's residence, one of the most perfect and imposing specimens of castellated architecture in Northumberland, is at present undergoing restoration, under the skilful direction of Mr. Ferguson, architect, London, who has also in hand the new buildings at Bamborough Castle under Lord Armstrong.

New cold stores at Avonmouth dock, intended principally for Canadian and American provisions, brought there by ocean steamboats, are being erected by Mr. J. Perkins, of Redland, Bristol.

A Leeds syndicate has acquired by purchase the Beaconsfield Estate at Bridlington Quay, situated on the north side, a little distance beyond the Parade, and is about to raise a great hall upon it. The edifice is the principal part of the buildings of the recent exhibition in Liverpool, including the central dome and the annexes, and consisting of ornamental wrought-iron. It will cover an area of 2,500 square yards, and will rise to a height of 100ft. The erection will comprise a central hall 82ft. square, large theatre, dancing saloon, concert-room, refreshment-room, billiard-room, &c., and in connection with it will be lawn tennis courts. Then there are to be some twenty shops on the ground level, half of them facing the sea, and over these will be a covered promenade. A large proportion of the roof will be of glass. The plans are being prepared by Messrs. Chorley, Connon, and Chorley, of Leeds.

It was reported to the urban district council of Tonbridge at their last meeting that, with regard to the High-street improvements which had gone to arbitration, Miss Noakes claimed £1,946, and was awarded £750; Mr. Coates claimed £1,454 15s. 11d., and was awarded £800; and the Al Boot Company claimed £1,037 19s. 3d., and were awarded £600.

The Battersea Vestry has decided to co-operate with the L.C.C. and pay a share of the cost of widening York-road between Wandsworth station and Falcon-road. The Vestry's contribution will amount to £17,000.

New buildings have just been erected for the Doncaster Co-operative Society in Station-road. Mr. Beck was the architect, and the outlay has been about £16,000.





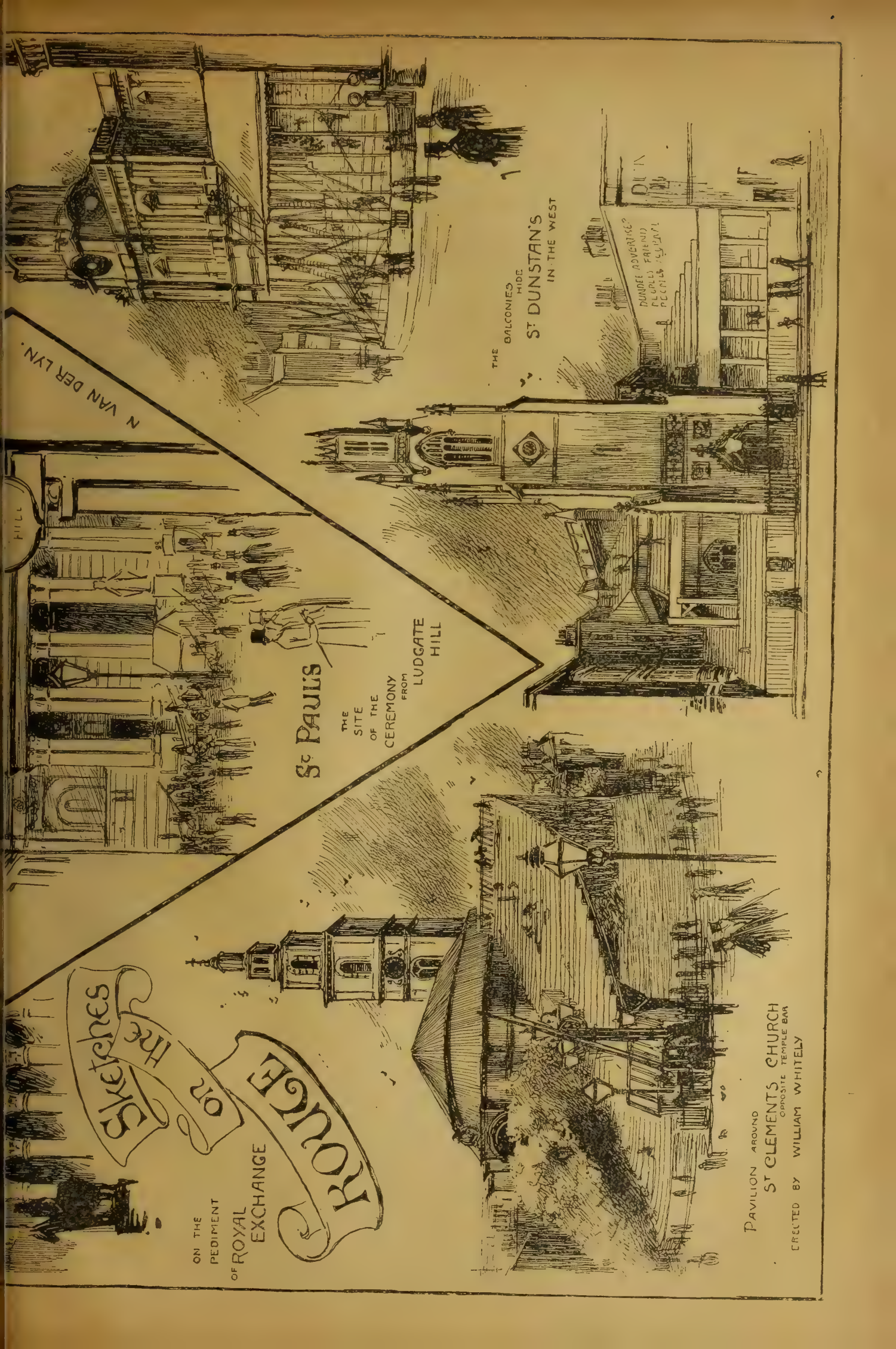
IN WESTMINSTER BRIDGE ROAD  
SOUTHWARK CATHEDRAL-HOUSE  
AND "THE JOINERS ARMS"

PAVILION AND BALCONIES  
AROUND  
ST MARTIN'S  
CHURCH  
ERECTED BY  
HARRODS LTD

UNITED WE STAND

A  
CORNER  
OF  
ST  
PAUL'S





N VAN DER LYN.

THE BALCONIES  
HIDE  
ST DUNSTAN'S  
IN THE WEST

DUNDEE ADVERTISER'S  
FLOPPY FRIENDS  
PEOPLES JOURNAL

St PAUL'S

THE  
SITE  
OF THE  
CEREMONY  
FROM  
LUDGATE  
HILL

FRONT OF  
ROYAL  
EXCHANGE

ON THE  
PEDIMENT  
OF ROYAL  
EXCHANGE

or the  
Sketches

PAVILION AROUND  
ST CLEMENTS CHURCH  
CREATED BY WILLIAM WHITELEY



## OBITUARY.

**HOFRATH JAKOB FALKE**, formerly Director of the Austrian Museum of Art and Industry, died at Vienna on Sunday. Born in 1825 at Ratzeburg, in Mecklenburg-Strelitz, Herr Falke studied at the Universities of Erlangen and Göttingen. Early in 1855 till 1858 Herr Falke occupied the post of conservator of the art collection in the German Museum at Nuremberg. In 1865 he was appointed one of the first custodians, and in 1872 vice-director, of the Art and Industry Museum in Vienna. Herr Falke wrote many works of great value and interest, including "German Costumes and Fashions," in which he relates the history of dress in connection with the changing spirit of the times; "A Contribution to the History of Costume in the Middle Ages," "History of Modern Taste," "Art at Home," "Hellas and Rome," and "History of Costume among Civilised Nations." In 1885 Herr Falke was raised to the post of president of the museum.

## CHIPS.

The Lord Chancellor of England (Lord Halsbury) will open the new addition to the Whitgift Grammar School, Croydon, during July.

The Duchess of Somerset laid on Saturday afternoon the foundation-stone of the new church of St. Barnabas, Clapham Common.

The Driffield Board of Guardians at their last meeting instructed Mr. J. Shepherdson, architect, to prepare plans and estimates for a new block of workhouse buildings for the accommodation of women only, the existing buildings to be adapted for the use of men.

On Saturday afternoon there was unveiled in Church-street, West Hartlepool, by the Marquis of Londonderry, K.G., the statue presented to the town, of its founder, the late Mr. Ralph Ward-Jackson (1806-80), the first M.P. for the borough. The statue was designed by Mr. Onslow Ford, R.A., is of bronze, 8½ ft. in height, and was cast from the model of Mr. Onslow by the Cire Perdue process, by Messrs. Rovini and Paulanti, Parson's Green, London. Mr. Jackson's figure is in an oratorical attitude, standing upon a 7 ft. pedestal of Portland stone. The four sides of the die are adorned with bronze shields.

Brightlingsea Urban District Council wish to raise a loan of \$6,000 for sewerage, and a Local Government Board inquiry was held by Colonel W. L. Coke on Wednesday week. Oyster merchants opposed in consequence of the position proposed for the outfall, which they said was much too near the oyster beds. The Water Company also opposed on the ground that the cutting past their works would be so deep as to interfere with their water supply.

The comparatively small area of land yet remaining vacant within the borough of Bootle is being rapidly built upon. Last month the corporation approved plans of three new streets and 177 houses; this month 51 proposed dwellings have been approved, besides several shops and extensions of existing works.

A pair of candlesticks, an exact copy of Fontana's candlesticks at Certosa di Pavia, has been presented by Mr. Gill to the Dean and Chapter of St. Paul's. The candlesticks are now placed in the north-west chapel. The Dean and Chapter have also been offered, and have accepted, a silver processional cross for use upon great festivals.

At the last meeting of the Street Urban District Council the award of the arbitrators in the dispute between the council and Mr. T. F. Huish, contractor, over the latter's claim for £126 for extras on the Portway sewer works was read. They awarded Mr. Huish £88, he to pay half of the costs of the arbitration (£8).

The Bishop of Llandaff on Thursday in last week opened a new church which has been erected, at a cost of about £3,000, at Llanbradach, a mining district outside Cardiff.

Under the terms of an agreement between the Carpenters', the Grocers', and the Drapers' Companies, an alteration in the line of frontage on the north side of Throgmorton-street will be effected in the course of the next two months. The pulling-down of a house over Throgmorton-avenue has brought the scheme into existence, but the details have not yet been agreed upon.

Two new Wesleyan chapels, each with accommodation for about 800 worshippers, are to be erected at Nelson at a total cost of £8,000.

At the last meeting of Kilmarnock Town Council it was intimated that Dr. Hunter-Selkirk, of Braidwood, had gifted to the town his antiquarian and geological collection, one of the most valuable and extensive in the country, in order that it may be placed in the new museum, for which Mr. Dick, of Glasgow, lately made provision by a gift of £8,000.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—The annual business meeting of this Association was held in the rooms, 187, Pitt-street, Mr. Wm. Tait Conner, A.R.I.B.A., president, in the chair. Secretary's and treasurer's reports were read and unanimously approved. The following gentlemen were elected office bearers for the ensuing session:—Mr. Jas. A. Morris, F.R.I.B.A., hon. president, Mr. Wm. Tait Conner, A.R.I.B.A., president, Mr. John Fairweather, A.R.I.B.A., and Mr. Geo. S. Hill, A.R.I.B.A., vice-presidents, Mr. Chas. E. Whitelaw and Mr. Jas. Salmon hon. joint secretaries, Mr. Robert S. Walker hon. treasurer, Mr. Hugh Dale, hon. librarian. General committee:—Mr. John Arthur, Mr. Walter Tucker, Mr. Alex. Wingate, and Mr. Alex. McGibbon, A.R.I.B.A. The travelling studentship prize for 1896-97 was awarded to Mr. George Edward Walker.

**LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ARTS.**—The annual exhibition of selected works done by the students of the City of Liverpool School of Architecture and Applied Arts during the past session was opened on Friday, in the Applied Art Building, University College. The exhibits include architectural drawings and designs by first and second year's men and more advanced students, modelling from the life, designs for fabrics, wall-papers, book-plates, stained glass, posters, &c., and many charming and fanciful sketches submitted for the Sketch Club competitions. There are some specimens of wood-carving and some excellent examples of wrought-iron work. In the premier department—that of architecture, which is under the direction of Professor F. M. Simpson, the principal of the schools—the collection of architectural drawings shows instances of excellent draughtsmanship and a grasp of the practical as well as of the artistic side of architecture, as evidenced by the treatment of working details. The subjects are a two-story façade in the Classical style; a doorway in the same style, with arched pediment; and a complete set of drawings and plans for a small country mansion. The reliefs and modellings, of a purely architectural character, are interesting. The object of the school as one of applied art is obviously kept steadily in view by Mr. Anning Bell, since the designs are for friezes, wallpapers, posters, book covers, cushions, hangings, and illustrations for periodicals and books, and are of a strictly applicable character, whether in black-and-white or colours. The black-and-white work predominates, and much of it is of distinctly fine quality, and while originality is fostered, eccentricity is kept down. The following is the list of prize winners:—Modelling from the Life (Telephones): 1, A. H. Griffiths; 2, J. H. Morcom. Head from Life: 1, G. Crofield. Panel Design: 1, A. H. Griffiths; 2, W. Webb. Panel Design (special prizes): 1, R. Murray; 2, F. Westcott. Extra prize, G. Shaw. Cast: 1, T. Rowan; 2, H. B. Bare. Drawing from the Life (day): 1, L. Crofield. (Evening): 1, A. Jenks. Drapery: 1, R. Warrington. Set of Designs: 1, C. A. Walker, who also shows some plates, &c., designed and made by her for the Della Robbia Company; 2, E. Jackson. Design (Evening): C. E. Prescott. Design of Ornament: 1, M. E. Carine; 2, G. Williams; (extra prize) R. Roberts. Wrought Iron: 1, E. Barstow and J. Lowe (equal); 2, H. Vogt. Junior: 1, W. Hawthorne. The prizes in the architectural department have not been awarded, the session in that subject being still in progress. Some important additions will be made to the classes of the school next session, which commences on October 4. Amongst others, Mr. R. L. Rathbone will hold a class in copper and brass work.

The second annual meeting of the London branch of the National Association of Master Plumbers will be held on Tuesday week, the 29th inst., at 5 p.m., in the Holborn Restaurant, the President Mr. R. A. Marshall, of Clapham, in the chair. The dinner will follow in the same building at 8 p.m.

At the Consistory Court of London, held before Dr. Tristram, Q.C., Chancellor of the diocese, on Friday, a petition was presented by the vicar and churchwardens of St. Paul, Camden-square, for a faculty to authorise alterations in the church. Among the alterations were the providing of oak choir stalls, the placing of two lights on the retablo, and the insertion of stained glass windows in the place of the present plain glass windows. The estimated cost was £1,200. Some opposition was raised and the Chancellor adjourned the case.

## COMPETITIONS.

**EXETER.**—The designs submitted in competition for a proposed drinking-fountain and illuminated clock-tower for Queen-street have been submitted to the consideration of Mr. James Hine, F.R.I.B.A., Plymouth, who has awarded the premium of ten guineas to Mr. S. K. Green-slade, A.R.I.B.A. The donor of the fountain and clock has decided in favour of the design prepared by Mr. T. Andrew, of Bedford-circus, and this will probably be carried out.

At Clifton, near Brighouse, on Friday, Colonel C. H. Luard, R.E., of the Local Government Board, held an inquiry respecting the application of the Halifax Rural District Council to borrow £1,800 for repairing the Halifax and Wakefield-road, in the township of Clifton, in order that it might meet the requirements of the West Riding County Council, and be taken over by that body as a main road.

It is proposed to rebuild the chancel of the fine old church of Hethersett, which was ruined in 1535—a little earlier than was the case with most Norfolk churches. The idea has grown out of a desire to erect a permanent memorial to a late resident, and subscriptions have been received or promised to over £1,750.

At Peterhead, N.B., last week, the parish council unanimously adopted plans prepared by Mr. Arthur Clyne, of Aberdeen, for reconstructing the poor lodging house to serve as a council house at an estimated cost of £2,000.

The Prince of Wales has expressed his approval of Mr. Sidney R. J. Smith's design for the memorial to the late Sir Augustus Harris at Drury-lane; the work is now being proceeded with.

In Southwell Cathedral, a new pulpit, the gift of the Ecclesiastical Commissioners, has been dedicated by the Bishop to the service of God. The pulpit is of teak, carved with the Virgin and Child, the symbol of the ancient religious foundation of St. Mary of Southwell. It was designed by Mr. W. D. Caroe, F.S.A., architect to the Ecclesiastical Commissioners.

The idea of connecting the Great Northern Station at Finsbury Park with the City by means of an underground electric railway to Moorgate-street was brought forward with the strong approval of the Great Northern Company in 1894, but owing to the death of the contractor, Mr. Williams, the scheme fell through. Now, however, Sir W. Pearson, Bart., M.P., the constructor of the Blackwall Tunnel, has agreed to take the contract, and to accept in part payment the whole of the deferred shares, amounting to £750,000. A Select Committee of the House of Commons has passed the preamble of the amended Bill granting the company an extension of time to June, 1902, for the acquisition of land and the completion of the works.

The Earl of Sheffield has offered to give to the urban district council of Newhaven a site for the erection of the proposed town hall and public offices to be erected as a permanent memorial of the sixtieth year of her Majesty's reign.

A new altar frontal has been presented for the Lady-chapel of Salisbury Cathedral. The colour is Sarum blue, and the design by Mr. S. Gambier Parry. In the centre panel is the Crucifixion, with emblematic Evangelists surrounding; on either side are angels bearing scrolls "Sic Deus mundum dilexit ut filium unigenitum daret." The four orphreys are pink passion-flowers mounted on blue velvet. The superfrontal is of blue velvet, divided by an architectural gold canopy into portions which contain angels and shields bearing the emblems of the Passion. The frontal is the work and gift of Mrs. Weigal, the Close.

A public meeting was held in Ramsey Palace on Monday night, to consider proposals made by the Isle of Man Tramway Company to construct an electric tramway from the south end of Ramsey Bay to Queen's Pier, and in case the promenade is widened, to carry it along to the harbour, and connect it with the Manx Northern Railway. This line will be part of a new electric line from Douglas to Ramsey. After a long discussion, the meeting, by an overwhelming majority, decided in favour of the new scheme, and accepted the tramway company's proposals. The work of constructing a seawall for the new marine drive along the margin of the bay will be commenced forthwith.

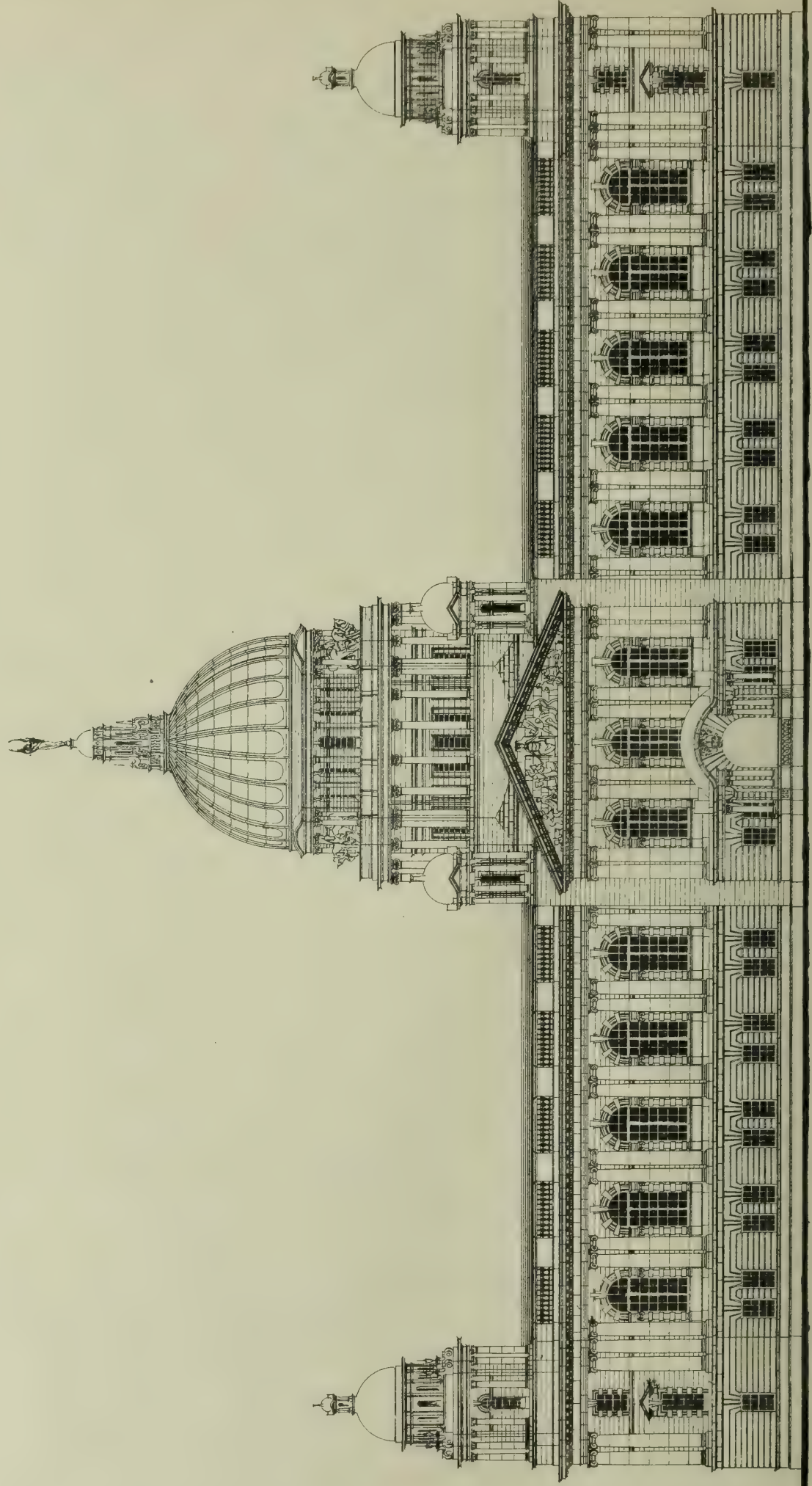
A Local Government inquiry was held at Lytham on Tuesday, into the council's application to borrow £10,000 for sewerage works and the erection of a destructor. A portion of the scheme was to drain Fairhaven and Ansdell, where building operations are being extensively carried out. It was stated that at the latter place 30 acres had been let for building land. Another part of the scheme included sewer outfall works at the east end.







THE BUILDING NEWS, JUNE 13, 1897.



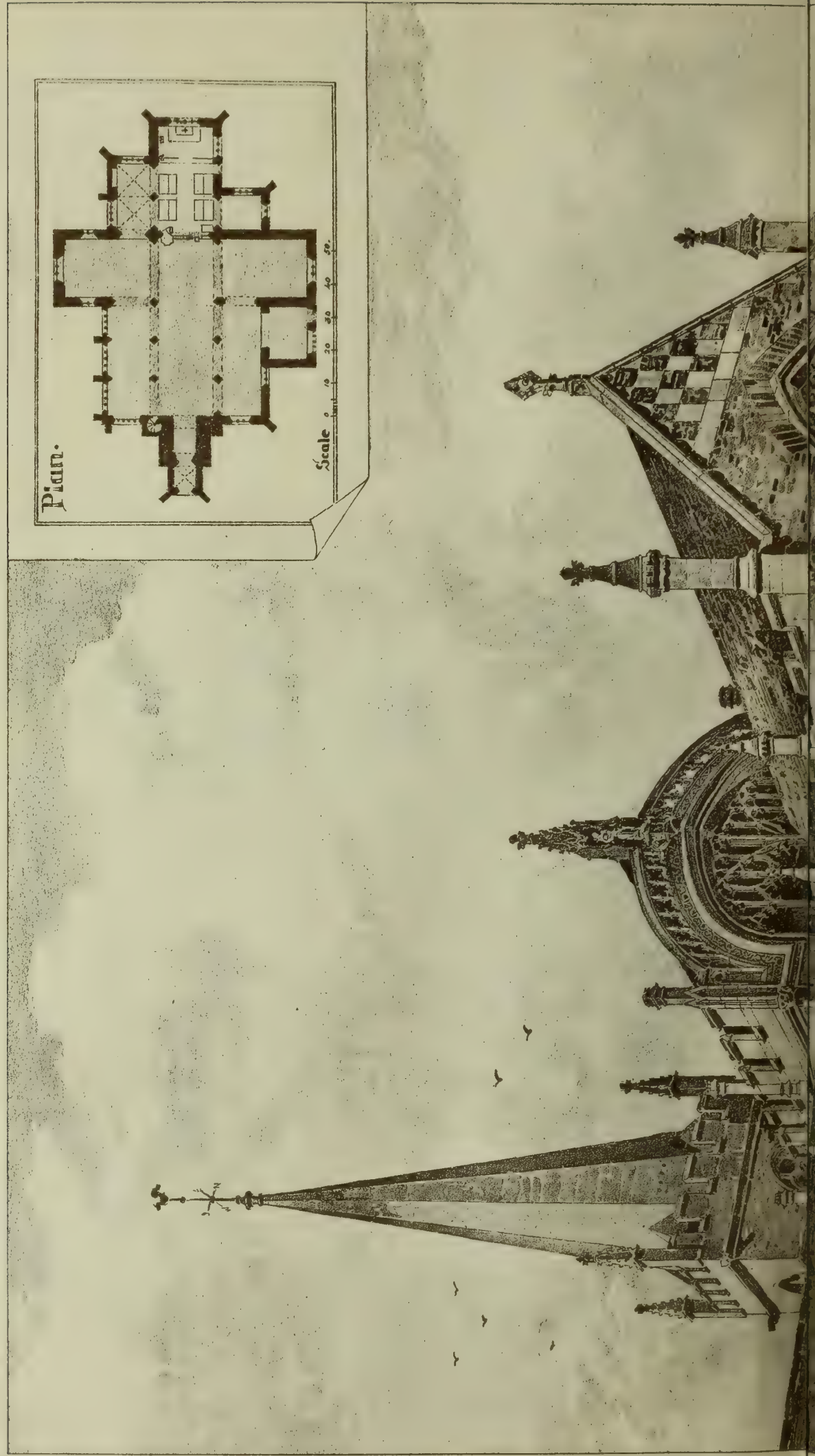
—ELEVATION TO DONEGALL SQUARE NORTH—



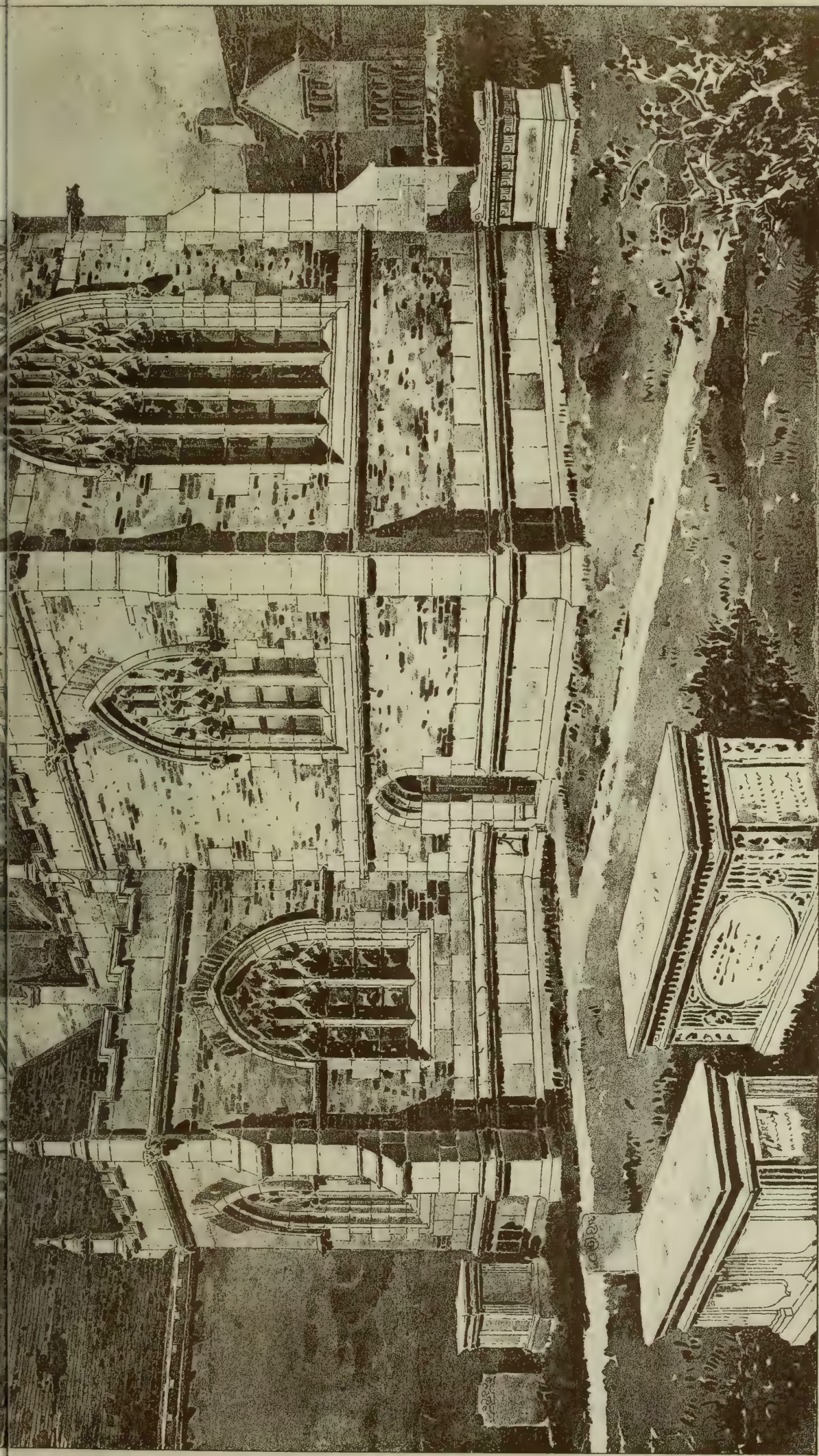




THE BUILDING NEWS, JUNE 18, 1897.







"PHOTO-TINT" by James Axerman of Queen Square, London W.

## MACOCK CHURCH WILKES-BARRE.

Proposed Remodeling of Chancel &c

View from the S.E.

Harold Dickspear, A.R.I.B.A. Archt.



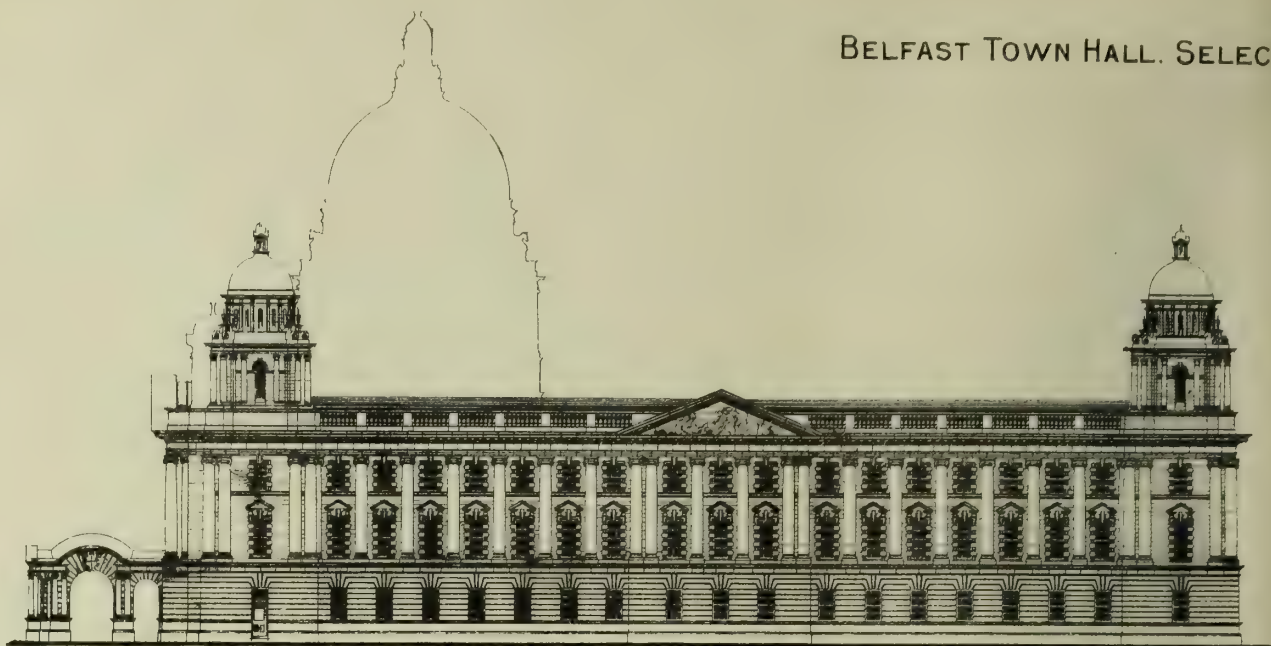




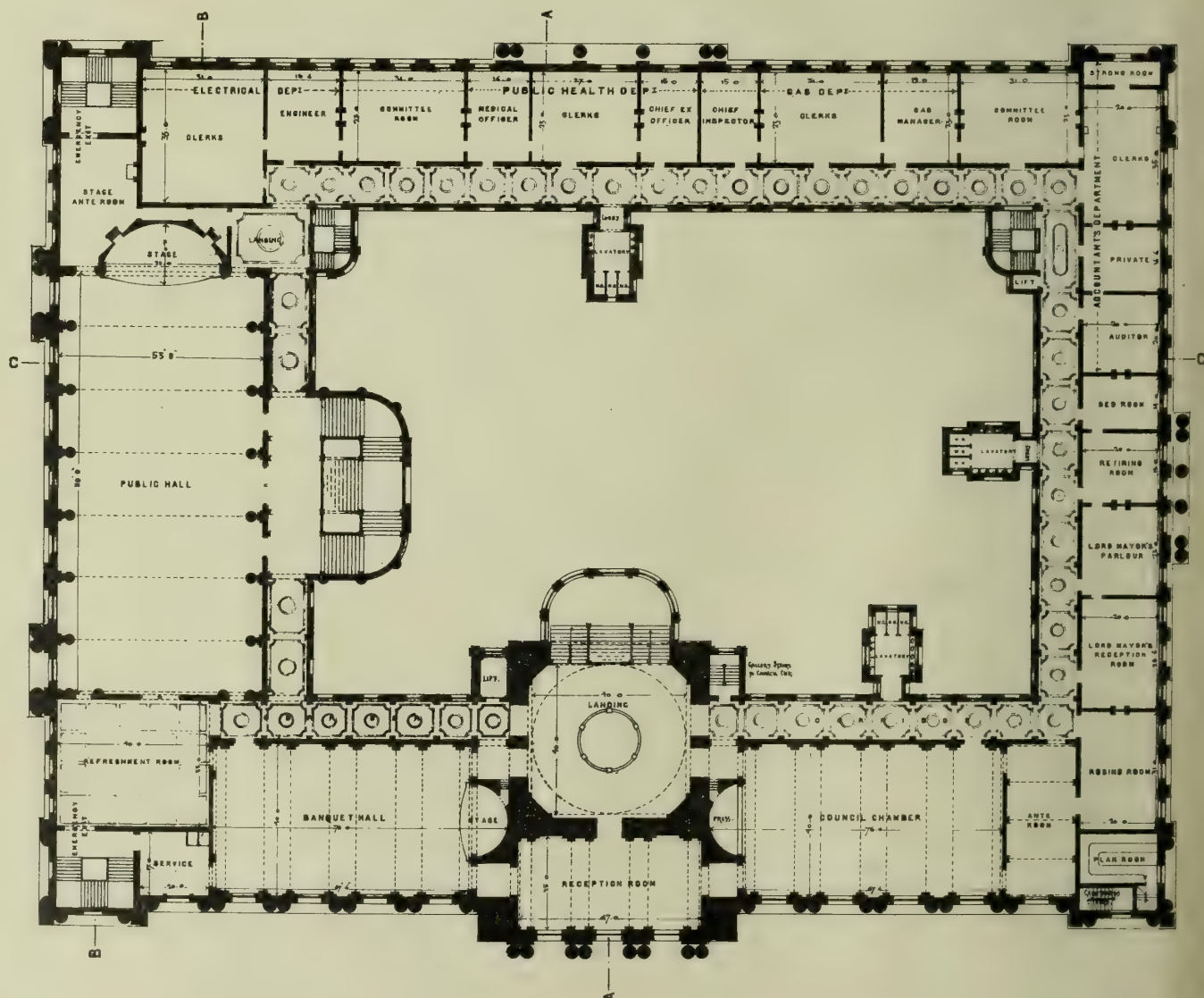




BELFAST TOWN HALL. SELECTED

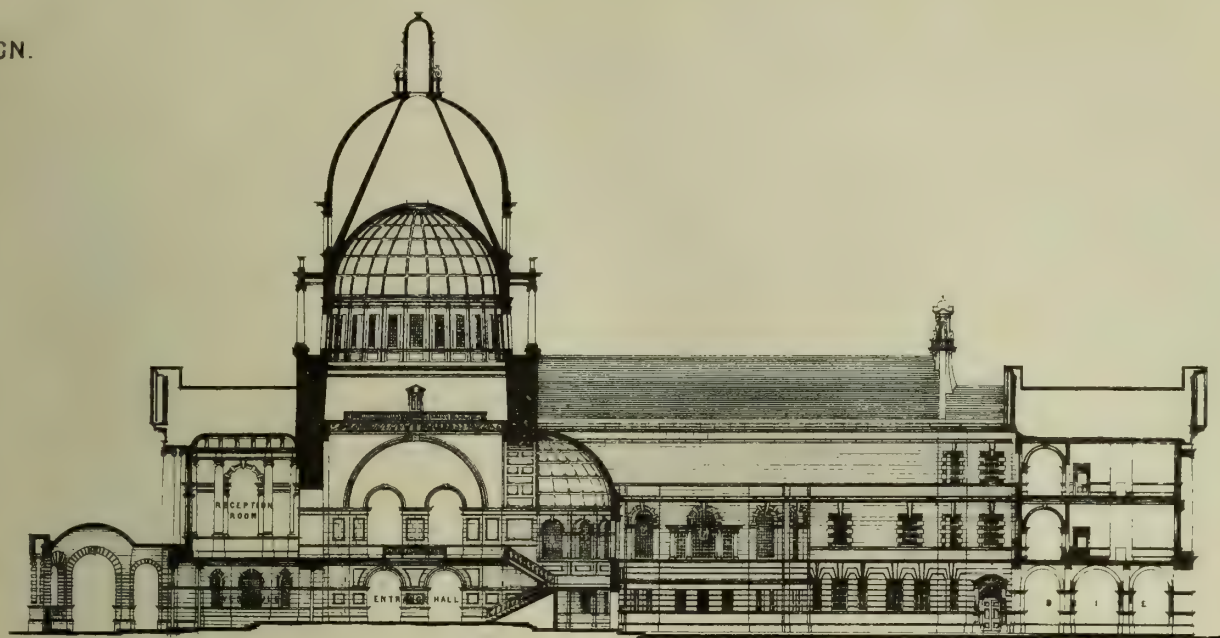


ELEVATION TO DONEGALL SQUARE WEST

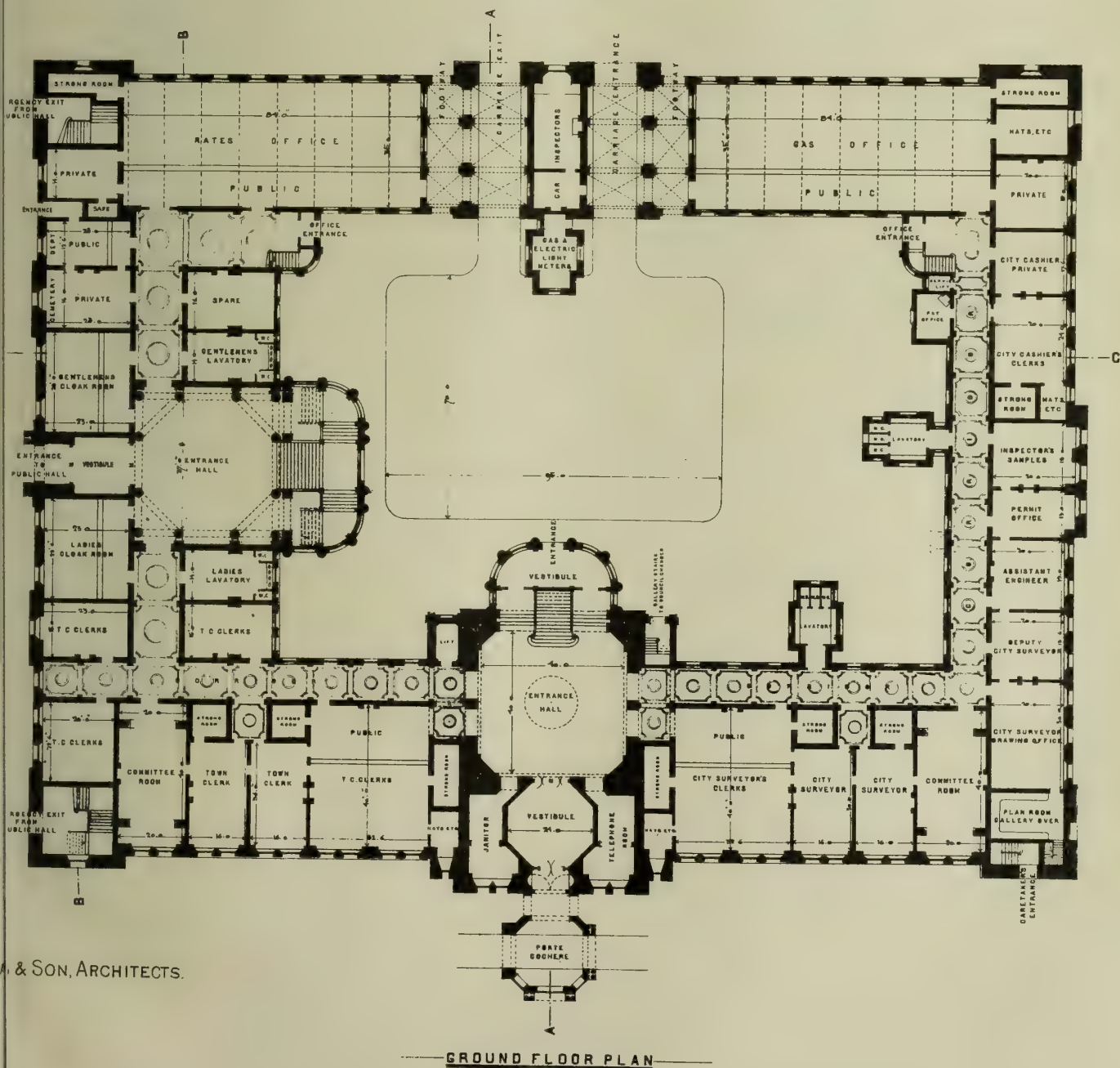


FIRST FLOOR PLAN





SECTION AA



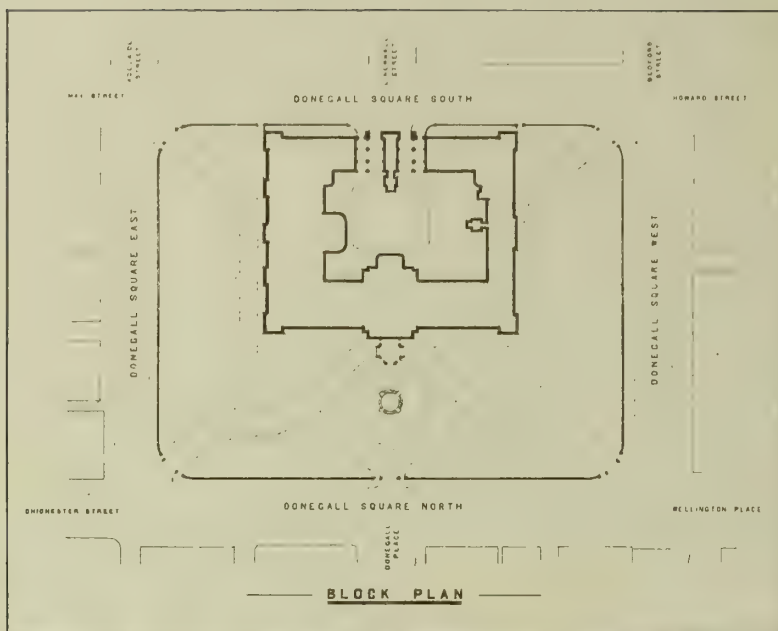












BELFAST TOWN HALL

MESS<sup>RS</sup> EDWARD THOS



VS., JUNE 18, 1897.

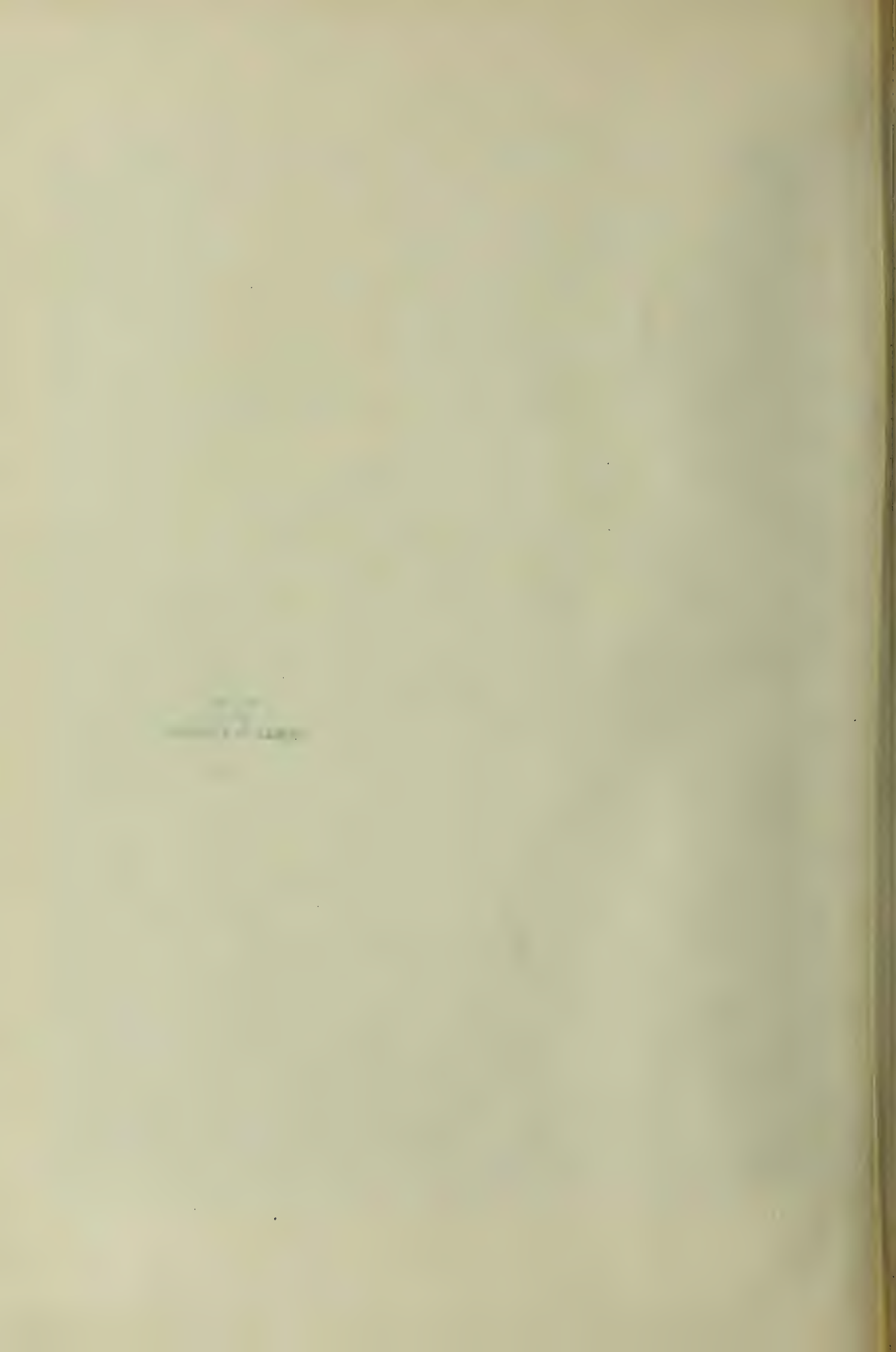


PHOTO-TINT, by James Akerman, Queen Square, London, W.

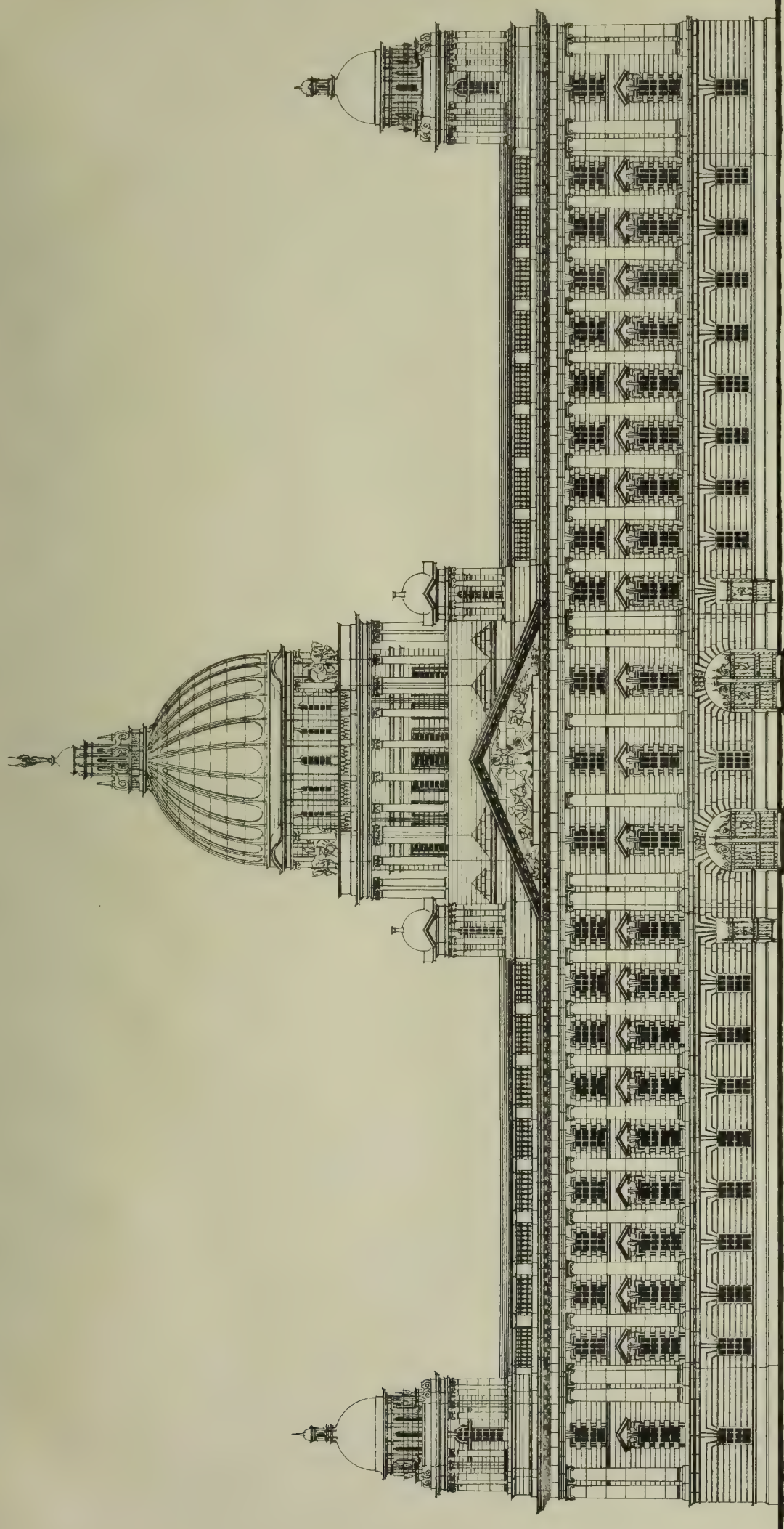
SELECTED DESIGN.

S & SON, ARCHITECTS.









— ELEVATION TO DONEGALL SQUARE SOUTH —







## Building Intelligence.

**ACTON, W.**—The foundation-stone of the Jubilee Cottage Hospital which is being erected at Acton at the cost of Mr. J. Passmore Edwards was laid on Wednesday week by Lady Rothschild. The building consists mainly of a ground-floor story. The main wards are at each side, one for males and the other for females, each containing four beds and a cot, with a very ample air space. Adjoining each there is a separate ward for one bed, bathroom, and necessary offices. A wide corridor runs from one ward to the other. The central entrance leads to a hall, on one side of which is a convalescent room, and on the other side the matron's room, also an operating-room, nurses' day-room, hospital dispensary, and administration offices. Above this are seven rooms available for bedrooms, or as special rooms for patients, also bath and linen-rooms, &c. In the rear are provided large kitchen, scullery, laundry, &c., with a separate entrance and waiting-hall for the supply of invalid dinners, and another separate entrance and dispensary for outdoor patients. The design is an adaptation of the Georgian style, in red and yellow bricks, with red tiles. Further extensions can be made without any alteration of the building now being erected. The architect is Mr. Charles Bell, F.R.I.B.A., and the builder Mr. George Hooper.

**EDINBURGH.**—The reconstruction of the Waverley Station is being pushed forward. The first instalment of the work, consisting of the booking-hall, will be opened on Monday next. Built from the plans of Messrs. Blyth and Westland, C.E., the new booking-hall is French Renaissance in style. The building measures 75ft. square, and rises to a height of 30ft., having a dome in the centre of the roof, surrounded by eight flat cupolas. Prudham stone has been used exclusively in the erection of the hall, the masonry being treated with a large amount of carving and moulding. The woodwork of the roof is composed of wainscoted oak, the intervening panels being filled in with Tynecastle tapestry. The frieze of the large central cupola has semi-relief figures in gold on a coloured ground. Under the flat cupolas, in order to avoid any chance of accident through falling glass, the architects have provided for the introduction of ornamental wrought-iron gratings. The booking-office itself, which is placed in the centre of the hall, and is octagonal on plan, is constructed of wainscoted oak, and is carved in keeping with the general surroundings. The design of the mosaic tile flooring is costly and elaborate, and shows the North British Railway Company's coat of arms introduced at the four corners, with a border representing the Scottish thistle. Below the hall cellars have been constructed.

**GARTLOCH.**—The new Gartloch Lunatic Asylum, erected at Gartloch, about seven miles to the north-east of Glasgow, having just been opened for patients, a formal inspection of the building took place on Tuesday by a specially-invited company. The institution has been erected by the City Parish of Glasgow for its insane poor at a cost, including grounds and furnishing, which will not be far short of £200,000. For the erection of the asylum the estate of Gartloch, extending to 347 acres, was purchased, and the plans of Messrs. Thomson and Sandilands, architects, Glasgow, having been accepted, the building was commenced in September, 1890, the construction of the institution having thus taken nearly seven years. There is accommodation for 380 patients in the asylum, and for about 140 in the hospital. There is also a farm with some fifty cows and a large garden.

**HETTON-LE-HOLE.**—The opening ceremony of the new Conservative Club took place on Wednesday. The building stands on a prominent site near the railway station, and opposite the vicarage. The frontage is about 48ft., and the depth is nearly 100ft. The building stands about 12ft. back from the highway. The building is two stories high. The ground floor is approached by a flight of steps at the front entrance. The building contains a billiard room, 45ft. long and 20ft. wide; reading and committee-rooms on the ground floor, and divided by a sliding partition, so as to throw them into one room, measuring about 47ft. long by 17½ft. wide; a smoke-room, also on the ground floor, a caretaker's room, a kitchen and outbuildings in the rear, on a level

with the reading and smoke-rooms. There are two bedrooms above the kitchen. The games-room adjoins the billiard-room. There is a quoit-yard at the back. Mr. Frank Caws, F.R.I.B.A., of Sunderland, is the architect. The contractor is Mr. Stephen Branton.

**LISKEARD CHURCH TOWER.**—Those who contemplate the pulling down of the present dilapidated church tower at Liskeard and the building of a new one, are at this moment very much perturbed in consequence of the Chancellor refusing to grant a faculty for the purpose unless the new tower to be erected is built of precisely same design and height as the present one, and with the old material. To this decision the committee naturally demur. They have to find the money for the contemplated work, and they are, they say, the best judges of what is necessary to be done. The idea of rebuilding the tower has been contemplated for many years, and in order to facilitate the project, Miss Pedlar, a lady resident, left a legacy of £1,000, with the provision that the work is to be accomplished in a certain time. In the event of this condition not being fulfilled, the money is to revert to Truro Cathedral. Several years have elapsed since the bequest, and the period named will shortly expire. Some persons are desirous that the time should expire before the rebuilding commences, so that £1,000 may go to the cathedral. Plans were recently prepared in competition, and one of these has been unanimously selected. A subscription list has been opened, and several amounts promised, and the work would by this time have been in progress but for this block.

**PURLEY.**—The memorial stone of the new wing to the Warehousemen, Clerks', and Drapers' Schools, Purley, Surrey, was laid on Monday, May 24, by the donor, Mr. J. R. Roberts, J.P. The new addition comprises eight large classrooms, and a central hall, 73ft. by 31ft., large covered playground, and a master's room, and is connected with the old building by a length of arched cloisters. The style is Tudor, executed in red brick and Victoria Patent Stone. The ventilation and heating are in the hands of Messrs. Rosser and Russell. The architect is Mr. J. Kingwell Cole, of Bloomsbury, and the builder Mr. Frank Potter, of Horsham.

**ROCHESTER CATHEDRAL.**—Dean Hole has issued a statement with reference to the restoration of Rochester Cathedral, which he is anxious to carry to a further stage. The total expenditure upon the west front and other works connected therewith, carried out under the direction of Mr. J. L. Pearson, R.A., was £7,358; besides this, between £600 and £700 has been expended upon the crypt. The old Norman work has been carefully preserved, and the southernmost aisle has been partitioned off into a series of vestries. Of the amount last named £500 was contributed by the dean as the result of his lecturing tour in the United States. It is now proposed to launch a larger scheme of restoration. It is desired to restore two of the roofs which were spoiled by being lowered in times gone by, and to build a new tower and spire in place of "the present deformity," as the dean rightly terms the existing tower. The estimated cost of this project is £20,000.

**YEovil.**—The new church of St. Michael and All Angels, in the suburbs of Penmilk, built and endowed by the late Mr. Harry Cole, formerly organist of Yeovil parish church, was consecrated on Saturday. It is of West Country character, and in the 15th-century style. It is built wholly, within and without, of warm tinted Ham Hill stone, from designs by Mr. J. Nicholas Johnston, A.R.I.B.A., of Yeovil. The south-western tower is square and embattled, rising some 80ft. The original drawings showed its battlements capped by carved pinnacles, and these were erected, but during the great gale last year several were blown down, and the others were removed to prevent future accident. On plan the church consists of the tower already alluded to, with nave and north and south aisles, divided by arcades of five bays on the north side and of four on the south. There are also two bays north and south of the chancel. These arcades are supported by clustered columns. The organ chamber is on the north of the chancel, east of the north aisle, and there is a vestry east of it. The roofs are covered in by blue slates capped by red ridge tiles. The walls of the aisles, which have lean-to roofs, are embattled and buttressed. The nave and chancel roof are of the West-country type of waggoned open timber, and are panelled—that of the chancel being supported by carved stone

angels. The floor line of the chancel rises considerably, and the high altar is well elevated. The edifice has a capacity of about 550, being seated with open pitch-pine benches. The fittings of the chancel are of carved oak. The high altar, in oak, contains three sculptured panels carved in high relief. The central one represents the Crucifixion, and on the sides the Nativity and the Entombment. The super-altar is also carved. The chancel screen stands upon a dwarf stone wall, and has double gates of wrought iron. The chancel fittings are the handiwork of Messrs. Hems and Sons, of Exeter, who have also executed the carved and sculptured stonework. The general contractor was Mr. H. W. Pollard, builder, of Bridgwater, and about £10,000 has been expended. Mr. H. Moore has acted as clerk of works.

### CHIPS.

At a general assembly of the Royal Society of British Artists Professor Herkomer, R.A., and Professor W. B. Richmond, R.A., have been elected honorary members of the society.

Mr. E. J. Physick, sculptor, has been commissioned to execute the memorial of the Rev. Dr. Edward Meyrick Goulburn, late Dean of Norwich, to be erected at Aynhoe, Northamptonshire.

The erection of the marble sarcophagus to inclose the remains of the late Prince Henry of Battenberg in Whippingham Church, Isle of Wight, has this week been commenced from designs by Mr. Nutt, chapter surveyor at Windsor Castle.

In accordance with a wish expressed by President Faure, the building is being discussed of a third edifice in the Champs Elysées, which would form, with the two Fine Art Galleries to be erected there, a harmonious whole, and could be used for the accommodation of Foreign Sovereigns visiting Paris during the Exhibition of 1900.

The Llandudno Town Council decided on Wednesday to borrow a sum of £25,000 for the purpose of carrying out a scheme of electric lighting.

The memorial buildings at Winchester College, erected in commemoration of the quin-centenary anniversary of 1893, were opened on Wednesday in presence of a representative gathering of Old Wykehamists. The buildings are English Renaissance in style, and are erected in Sickhouse Meads. Mr. Basil Champneys is the architect. The aim of the authorities is to promote a taste for archaeological matters and for Classical and Mediæval art. Special attention has been paid to architecture, and there is a large collection of bromide photographs, presented by Mr. Samuel Rawson Gardiner, of pre-Norman and Norman, Early English, and Decorated and Perpendicular buildings. There are also portfolios of photographs of Venetian and Florentine pictures, and some examples of the English, French, Spanish, German, Dutch, and Flemish schools. Mr. Hardy, one of the masters, is organising a section concerned with Wykehamical antiquities and pictures.

At Kendal, on Tuesday next, the clock and bells in the tower of the town hall and the recreation grounds at Abbot Hall and Castle Hill will be formally dedicated to the use of the inhabitants.

"A Visitor" writes: "When visiting Stratford-on-Avon to-day, I was shocked to find the delightful view of Shakespeare's Church, hitherto obtainable on approaching the town from the Clopton Bridge, being obstructed by the erection of a barn-like brick structure, said to be for a boat-house. What are the Stratford people about to permit such a thing, and who is responsible?"

The Billericay Rural District Council have engaged Messrs. Fredk. Beesley and Son to prepare a scheme for the water supply of Billericay and Great Burstead.

The parish church of Ingrave, Essex, has lately been further enriched by painting in tempera by Mr. Reginald Hallward. The design is a border 1ft. wide of doves, texts, cherubs' heads, and flowers, dividing the two colours on the walls of the nave, and bringing the whole into complete harmony. The chancel was painted by the same artist three years ago.

On behalf of the Local Government Board, Colonel John Oud Hasted held an inquiry at the Council Chamber, Keighley, on Tuesday, into the application of the corporation of Keighley for power to borrow £50,000. The highways and street improvements committee sought borrowing powers in respect to an estimated expenditure of £39,591 upon improvements in North-street and street widening from Bradford-road to Aireworth, together with the erection of an iron girder bridge. The gas committee applied for £10,639 in order to enlarge the two holders at Thwaites, and thus increase their storage capacity from 1,446,000c.ft. to 2,386,000c.ft. Mr. Laycock, the manager, explained this proposal.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., LXX., LXXI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

\* In response to complaints from readers that they are unable to get the BUILDING NEWS at Messrs. W. H. Smith and Son's bookstalls, we can only suggest that they should order the paper of some other newsagent. Messrs. W. H. Smith and Son recently requested us to allow them an extra discount beyond that allowed to the general trade, and because we declined they have ceased to send the paper out to their bookstalls. We have, of course, no remedy; but we do not think the demand was a fair one.

RECEIVED.—W. S. L.—F. M. and Son.—G. H. J.—R. F.—S. M. C.—M. M. Co.

## Correspondence.

## LIVERPOOL SCHOOL BOARD OFFICES.

To the Editor of the BUILDING NEWS.

Sir,—Referring to your illustration of the plans of this building, I should be much obliged if you will state that, owing to the omission of the explanatory section on line A A, the ground-floor rooms appear to be very inadequately lighted. The section shows that these windows are continued above the roof of the central waiting-room to the height of 7ft., which, as a matter of fact, amply lights the surrounding rooms.—I am, &c., CHAS. E. DEACON. Central Buildings, Liverpool, June 16.

Selkirk Police Commission have unanimously agreed to proceed with a gravitation scheme for a supply of water for the town, to be drawn direct from the Lewinshope and Scaddow Burns, and led by an eight-inch main pipe to a high-service reservoir on Selkirk Hills. The cost is estimated at £11,500.

The fine tapestry map of Warwickshire and adjacent counties, dated 1588, belonging to York Museum, which was exhibited at the Royal Geographical Society some time ago, has been carefully cleaned and repaired, and will be on view at the School of Needlework, 17, Sloane-street, from Thursday in next week, the 24th inst., until Saturday, July 10.

## Intercommunication.

## QUESTIONS.

[11637].—**Waterproof Glue.**—Could anyone tell me of a good recipe for a cheap waterproof glue? The canvas on my observatory-dome has become detached in places. Shellac, or fish-glue are, of course, too expensive for a large surface.—STAR-GAZER.

[11638].—**Damp.**—I have a house the front wall of which is damp. It is built of stone, lias-lime plaster, and brick dressing to windows and doors and cornices. After rain or damp weather the interior of walls shows a dampness. Do you think if creepers were allowed to cover it that it would draw the dampness outward, or is there any kind of paint could be used? No doubt some of your many readers could suggest a remedy, and oblige.—I. D.

[11639].—**Frosting Glass.**—Will some of our kind readers give me a few hints on frosting glass with acid?—C. L. C.

## REPLIES.

[11630].—**Contract Signing.**—The signature of a partner for a firm would be sufficient in most cases. If a manager signs, he should add "For the firm of Brown and Jones."—LEX.

[11631].—**Office Correspondence.**—Pigeon-holing the letters is perhaps the best plan of keeping them for reference, each hole having a letter or name of the person. Every business letter should have a margin on the left-hand side. Some professional men simply fold the letters, label them on the outside, and file or tie them up in packets. It is best to fold the letters longways into three, so as to make a long, narrow packet for reference.—PRACTITIONER.

[11632].—**Architects' Book-keeping.**—I think Mr. J. Leaning has published a small book on this subject. Look over volumes of the BUILDING NEWS, where the subject has been treated.—G.

[11633].—**Elliptic Arches.**—Try a three-centred arch, having its side radii each one-fourth and its central radius 1½ times the span. Kindly say whether your five-centred arch is a more pleasing one. If so, what is your rule for striking it?—VOUSOIR.

[11633].—**Elliptic Arch.**—Get any work on practical geometry, and you will find several methods of describing an elliptic arch of a given height and span; but no one rule will hold good for any proportion. For one form, in which the small arcs are bold, the long diameter representing the span of arch may be divided into four parts. Set down from the same horizontal line the height of proposed arch plus one-eighth of span, and the point so given will be the centre of the large arc. The side ones will be struck from the first and third divisions, and will be limited by lines drawn through the centres as usual. "J. W. S.'s" question is hardly clear. The trammel method is the most accurate. It would not be easy to give a rule that will be pleasing and approximately correct for any ellipse.—GEOMETRIC.

[11634].—**Cottage Hospital Ventilation.**—If the outlet vent-shafts are active under every condition of the atmosphere—which, of course, is the main thing—disease germs could not "remain in them and accumulate." If the air-pump ventilator is in acting order, and proper inlets for fresh air are provided, no danger ought to be apprehended from the cause mentioned. Several methods of ventilation, natural and artificial, are employed. Besides the windows, admission of air may be provided for by tubes from an opening into the open air at the floor-level, as well as at the upper part of ward near ceiling. The air can be admitted at either level by valves, one at the floor-level, and the other at the ceiling level. In summer, when the stove is not used, the lower opening can be kept open, and when the stove is in use the upper opening. The foul air is extracted by a flue from floor level, above the roof, and this flue can have openings at both levels of the ward. Thus, in winter, when the stove is used, the upper aperture into this extraction-shaft can be closed, and that at the floor level to be opened, so that the vitiated air is extracted near the floor level. This is like Dr. Böhm's system. Several artificial methods are in use by which the foul air is extracted near the floor level, as that of General Morin. See Billings's work on "Ventilation."—G. H. G.

At an influential meeting of citizens of Sheffield, held on Wednesday, it was decided to erect a statue to the Duke of Norfolk, to commemorate his services to the city as mayor. The statue will be placed within the recently opened town hall.

The foundation stone of the new Corporation Baths, now in course of erection in East Hull, was laid on Friday afternoon by the mayor. The new building will be in the Renaissance style. The men's swimming bath is 96ft. by 30ft., and the depth of the water 6ft. 6in. In the boys' bath the size will be 60ft. by 30ft., and the depth from 3ft. to 4ft. 6in. There will be 31 private baths, a laundry, and washhouse.

The new chancel of Souldern St. Mary, near Banbury, was solemnly dedicated by the Bishop of Reading on Whit-Tuesday week. It has been designed by Messrs. Bucknall and Comper. The lines of the old building have been followed with low-pitched (nearly flat) lead roofs and square-headed windows, and discoveries made in the progress of the work showed that, both in these respects and in general dimensions, the new building is in some sort a resurrection of the chancel that a gross act of vandalism destroyed a hundred years ago.

## LEGAL INTELLIGENCE.

**BUILDING ACT CASE.**—WHAT IS A WOODEN STRUCTURE?—At the West London Police-court, on Friday last, Messrs. John Barker and Co., Ltd., of Kensington, were summoned by the London County Council for permitting, from the 20th February to the 20th April, 1897, a wooden structure to be set up without a license from the Council, contrary to section 84 of the London Building Act, 1894. Mr. Thomas A. D. Chilvers, from the Solicitor's Department, prosecuted, and Mr. R. Cunningham Glen, barrister, defended. Mr. Chilvers stated that on the 19th February, 1897, the defendants were convicted of having erected at their premises in Pembroke-road, Kensington, a structure 90ft. long by 40ft. wide, and from 17ft. to 25ft. high, constructed of wooden uprights let into the ground, fixed to which was a wooden roof covered with corrugated iron. The defendants had now removed the uprights, and in place thereof had stacked timber which formed the supports of the roof, and he (Mr. Chilvers) contended that, by the alterations made, the defendants had not removed the structure, and were therefore liable to the 59 days' penalties claimed in the summons. Evidence having been called on both sides proving the alterations made, Mr. Glen contended that the summons must fail, as the original structure was not now in existence; that what was on the site was merely a stack-pile or store of timber not being a structure fastened to the ground, and was therefore exempt from that part of the Act by section 85. The magistrate, in giving his decision, stated he was of opinion that the alterations made did not do away with the structure, and that the defendants, by keeping up the structure in its present condition, had committed the offence charged in the summons, and he fined them £2 19s., being 1s. per day.

**BUILDERS AND ARCHITECTS.**—**STRONG CRITICISM BY JUDGE WADDY.**—His Honour Judge Waddy, Q.C., had before him in the Sheffield County Court on Friday an action which had been remitted from the High Court. The plaintiffs were Moorwood, Sons, and Co., ironfounders, of Harlestone Works, Sheffield, and the defendants George Longden and Son, builders and contractors, Neepsend, and the action was brought to recover £54 18s. 3d., the price of goods, consisting of stoves and tiled hearths, sold by plaintiffs to defendants. Mr. Waugh, in opening plaintiffs' case, said, on September 9, 1895, Messrs. Longden and Son, the defendants, entered into a contract with the Chairman and Weekly Board of the Sheffield Royal Hospital for the extension of the hospital. Messrs. Hadfield, Son, and Garland were the architects, and Mr. Hadfield gave plaintiffs orders to supply stoves, the cost of which was now sued for. It was, said counsel, well known that whenever an architect ordered goods to be sent to works he was ordering as agent, and not as principal. Before the whole of the goods had been supplied, plaintiffs asked Mr. Hadfield whom they must charge for the stoves, and Mr. Hadfield replied "Messrs. Longden and Sons." Before giving his certificate the architect saw the defendants, who told him they would pay for the stoves, and on December 23, 1896, he made out his certificate for £50 on account. The defendants had not paid. On the occasion of one application for the money something was said about a contra account for gannister which was owing to Messrs. Longden, but this had now been paid. Defendants took no notice of a letter threatening legal proceedings. Counsel contended that the goods had been delivered on defendants' account, the architects had given them credit in their account with the Weekly Board of the Hospital for these very goods, and under these circumstances he submitted that defendants could not now turn round and say they were not bound to pay. Mr. Ellison, for the defence, contended that the defendants were not directly liable for the goods. The order was given by Mr. Hadfield, the architect, on behalf of his principals, the Weekly Board of the Royal Hospital, and he argued that Mr. Hadfield was liable. From a pecuniary point of view the question in dispute was to some extent immaterial, where all the parties in the case were solvent, as was so in the present action. It was, however, very important, indeed, if it was to be made a precedent that a contractor was likely to be sued for things which were ordered by an architect. His Honour alluded to some references made to previous litigation between the parties, and said it was clear there was some abominable feeling in the case. There could be no doubt about the substantial justice, but were they, because there had been some unfortunate feeling about a previous action, to fight the case through? Mr. John William Wilson, manager for plaintiffs, deposed to receiving from Mr. Hadfield the order for the goods, and he supplied them accordingly. Mr. Charles Hadfield, architect for the alterations and extensions in connection with the Royal Hospital, said he ordered the goods as the architect, and because the provisions of the contract empowered him to do so. When plaintiffs wanted money on account he requested Mr. Longden, as a matter of courtesy, to advance plaintiffs £50 on receipt of his certificate.—His Honour: Then who do you consider ought to



pay for the goods in the case, for you ordered them?—Witness: Well, if you look at it as a strict matter of business, I ought to pay; but I have already explained that I ordered the goods as the agent of the Royal Hospital authorities.—His Honour: So do I think you ought to pay.—Witness: But that would not be at all fair to the architect to make him pay for the goods he ordered as an agent. Of course, it would not make a penny difference to him, but he takes this course because it is the customary one, and if the principals ordered the goods direct they would often get a lot of rubbish which the architect would not have. Mr. Ellison, for the defence, urged that there was no agreement on the part of his clients with plaintiffs to pay for the goods, and such an undertaking must be proved if plaintiffs were to succeed in the action. All that Mr. Longden did was in the spirit of courtesy to consent to act as Mr. Hadfield's cashier at that gentleman's request. He called Mr. James Longden, head of the defendant firm, who said a clerk from plaintiffs' firm came to the office and said he had a certificate. Witness directed him to go to the cashier, and personally he did not see the certificate. Cross-examined by Mr. Waugh, witness said the understanding was that if he paid money to plaintiffs on Mr. Hadfield's certificate he would be entitled to repayment of such an advance from the Weekly Board of the Royal Hospital. His Honour, in giving judgment, said on previous occasions and in other places he had felt called upon to express his astonishment that in these days of enlightenment contractors and builders should be such stupid and absolutely helpless people as to give themselves up with their throats wide open to be comfortably and happily cut by the architects by whom they were bound. But they did so, and they made contracts of the most astonishing character it was possible to conceive, and in which they put themselves to the greatest possible difficulties. He was bound to say that under these conditions his sympathies were very largely indeed with the builders, and although perhaps he ought not to say it, they were very much indeed against the tyrannical propositions of the architects. On the other hand the architects argued that this was the only way in which building operations could be carried on, and that it was necessary to have absolutely unfettered discretion in some one man's hands, so that he could exercise his brains when any unforeseen change or contingency in the course of trade took place. This might be so, and he was not there to express himself officially or judicially with regard to that matter. Mr. Longden knew that if he paid the money he would simply take it from one pocket, and get it back from the Royal Hospital authorities. He suspected that the history of the action was to be found somewhere in the neighbourhood of the contra account which had been mentioned. The parties had been to law before, and there was bad blood on both sides. He was of opinion that Mr. Longden undertook to pay, and therefore judgment would be for plaintiffs for the full amount claimed.

The thirteenth centenary fund for the restoration of Canterbury Cathedral now amounts to close upon £17,000. One of the latest contributions to the fund is a gift of 100 guineas from the Mercers' Company.

The directors of the Glasgow and South-Western Railway drove on Wednesday week along the route of a proposed new line which, if constructed, would place their Company and the Midland on an equal footing with the west coast so far as mileage is concerned. The proposed deviation commences a few hundred yards to the north-west of Sanquhar Station, on the main line of the Glasgow and South-Western Railway, and proceeds almost due north up the valley of the Crawley to the borders of Dumfriesshire and Lanarkshire. Thence it will run by way of Douglas and Leshmahagow towards Hamilton, where a junction will be effected with the North British, over whose system the journey into Glasgow would be completed. It would open up quite a new line of country, and, in addition to passing within a mile of the Wanlockhead lead mines, would go through a district in which coal, limestone, and iron are known to exist. The journey between Glasgow and the south would also be shortened by at least 15 miles on the present route.

The Edinburgh City Council received, at their meeting on Tuesday, a recommendation from the streets and buildings committee, based on a report by the city road surveyor on the offers submitted for Australian hardwood for paving Princes-street, north side, from St. David-street to West Register-street, South Bridge from High-street to near Chambers-street, and Earl Grey-street. The committee recommended the paving of Princes-street and South Bridge one-half with Jarrah wood and one-half with Karri wood, and the paving of Earl Grey-street with Tallow wood or Blackbutt. The prices are: Jarrah, £11 2s. 6d. per 1,000 blocks; Karri, £10 17s. 6d. per 1,000 blocks; and Tallow wood £10 5s. Princes-street and South Bridge were agreed to, but Earl Grey-street was delayed.

## Our Office Table.

THE Rev. Prebendary Harry Jones, writing from 8, York-gate, Regent's Park, makes the following sensible suggestions as to the Jubilee scaffoldings:—"Since a famous text says, 'Behold how great a matter a little fire kindleth,' let me obey a preaching instinct by remarking that of course every wise man who seats a crowd on an unlit pyre provides them or their attendants with accessible buckets filled with water, to be promptly emptied on a threatening spark—or a defiant smoker. Thus any cremation of the jubilant living may be frustrated. But I have not seen it suggested that they should be supplied with some of the extinguishing hand grenades seen ready to be thrown upon an incipient flame in many even private houses."

ANOTHER stage has been reached in the proposal to provide Cardiff with a group of municipal buildings worthy of that prosperous and growing port and commercial centre. A special committee of the Cardiff Corporation has decided by a substantial majority to recommend that a site for the new town hall and law courts be found at the southern end of the western side of Cathays Park, which has been acquired by the corporation, and is about to be laid out as a public park. It was further resolved that advertisements be issued inviting designs for the proposed building, and that premiums be offered of £500, £300, and £200 for the three best designs, the prize, however, to be merged in the commission, should one of the premiated architects be appointed as architect.

THE Irish Board of Works are making some vandalistic alterations to the frontage of the Custom House at Dublin. On each side of the splendid portico beneath the graceful dome there is a seven-arched cloister. On the eastern side the spaces between the arches are being fitted with window sashes, the idea being to turn the cloister into offices, and thus provide additional accommodation. When the work is finished, however, the beauty which the cloister adds to the building at large will have completely vanished, and not only this, but as the cloister on the other side is not being interfered with, the general harmony of design will be disturbed and the positive element of ugliness introduced. Agitation is being got up against the changes referred to, but, as with most Irish movements, it is probably set on foot too late, and without sufficient unanimity on the part of the promoters.

A CONGRESS was held under the auspices of the British Institute of Public Health on Wednesday, in the Guildhall, under the presidency of the Lord Mayor. Lord Playfair, in proposing that an address be presented to the Queen in connection with the progress made in sanitation during the past 60 years, reviewed the advances of hygienic science during the present reign, and said that in no other direction had progress been greater. Especially had this advance been marked since 1838, when the health of the people became the subject of national care. For the benefits we had received in this respect we were greatly indebted to Sir Edwin Chadwick, the late Prince Consort, Sir John Simon, Sir James Simpson, Lord Lister, and others. The Bishop of London seconded the address, which was supported by Sir J. N. Dick and Surgeon-General Jameson—who testified to the enormous improvement effected in the health conditions of the Navy and Army—and was adopted. The address expressed gratitude for the blessings enjoyed by all classes of the people during her Majesty's reign. This was largely owing to the health legislation of the past 60 years, which had resulted in the lengthened duration of life, diminished sickness, the lessening of pain, and the brightening of the lives of the industrial classes.

THE thirty-fourth annual meeting of the Incorporated Gas Institute was opened at Bath on Tuesday, under the presidency of Mr. C. Stafford Ellery. In the annual report gratification was expressed that the new ballot list contained no fewer than 52 names, bringing the total membership up to 686. The report also stated that it had been unanimously resolved to award Dr. Welsbach the "Birmingham" medal in recognition of the invaluable services rendered by him to the gas industry by means of his invention of an incandescent system of illumination. In his address, the president said the fact was patent to all that a knowledge of chemistry was

becoming increasingly essential in the training of a gas engineer. He ventured to think that neither in greater gasholders nor, in fact, in any engineering feats of economy would advances in the near future come; but they would come rather from discoveries by chemists and scientists in extracting more gas from the raw material, and effecting greater economy in its use.

THE American Association for the Advancement of Science will meet at Detroit, Mich., August 9 to 14, and arrangements for the entertainment of the members are well forward. The Hon. Thomas W. Palmer, the well-known World's Fair executive, is acting as chairman of the general and finance committee. The new high school building, with a good auditorium and rooms for the meetings of sections and committees, affords ample accommodation for the American Association and allied societies. The citizens of Detroit have seconded the invitation of the American Association inviting the British Association to meet in that city the week preceding their meeting at Toronto, and it will be the endeavour of the citizens of Detroit to extend the same courtesies to the foreign body as to the American Association itself.

## CHIPS.

The foundation-stone of the Museum and Art Gallery for Plymouth will be laid with due ceremony by the Mayor of Plymouth on Tuesday next.

Yesterday (Thursday) Mr. John Ord Haster, R.E., held an inquiry at the town hall, Leeds, on behalf of the Local Government Board, relative to an application from the Leeds Corporation to borrow £60,000 for works connected with the relaying of the pavement in the streets lying between Kirkstall and Roundhay.

Mr. T. Clarke has resigned his appointment as road surveyor to the Christchurch Rural District Council.

It is proposed to acquire the site of the Three Indian Kings Court and Hotel at the Quayside, Newcastle-on-Tyne, with adjoining property, and build thereon a new Merchants' Exchange. Plans have been prepared by Mr. Charles T. Marshall, M.S.A., of Newcastle, showing a hall 110ft. by 17ft. and 37ft. in height, lighted from a central dome, a reading-room 55ft. by 28ft., a vestibule 40ft. by 20ft., and other apartments.

A new Free Church, which has been erected at Craigneuk, Wishaw, was formally opened on Saturday afternoon. The style of the new building is a type of Early Gothic. The church is seated for fully 500, with a vestry and hall to accommodate 150, and the estimated cost is £2,150.

The parish church of Heeley, near Sheffield, was reopened on Sunday after renovation and enlargement.

In the Estate Market at the Auction Mart business was very slack last week. The demand for the classes of investments usually much sought after was languid, and a large number of residential properties met with very slight support. On the other hand, several landed estates and farms and City properties were satisfactorily disposed of at high figures. The aggregate was £114,050, by no means a satisfactory return, and much less than might have been reasonably expected.

The Devonport Town Council at its last meeting adopted a report by the new municipal offices committee, and decided, for the purpose of facilitating the acquisition of the glebe field situate near the London and South-Western Railway Station, to use the powers conferred upon them by the Lands Clauses Consolidation Act, 1845, and make application to the Rector of Stoke Damerel, as owner of the glebe, for the purchase of the said field, containing about 3½ acres, the price for which is £9,000. The site has been selected for the proposed town hall and municipal offices.

At Friday's meeting of the Glasgow Dean of Guild Court there were 35 petitioners, and linings for property to the value of £100,000 were granted. The chief linings were those granted to the Baltic Chambers, Ltd., who received permission to erect a block of offices in Wellington, Cadogan, and Holm streets, Glasgow, at a cost of £38,500; to the trustees of Free St. Matthew's Church, Glasgow, who received permission to erect a church and hall in Garscube-road, Glasgow, at a cost of £5,000; and to the trustees of the Glasgow Church of Scotland Church Extension Association, who were granted a lining to erect a church and hall at the corner of Doncaster and Hinshaw streets, Glasgow, to be called St. Cuthbert's Church.

On Monday a new Wesleyan chapel was opened at Harleston, Norfolk. It is of red brick, and will seat from 300 to 400.



## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (To-morrow).**—Edinburgh Architectural Association. Annual Excursion to Linlithgow. The Palace, St. Michael's Church, Bonhard House, and Kinnell House will be visited. Train from Waverley Station, 9.10 a.m.

## CHIPS.

The John Robinson Memorial Church at Gainsborough was opened with much ceremony last week. It has been built from designs by Mr. R. C. Sutton, of Nottingham, and is designed to accommodate 600 persons, having a school hall, holding about 300, with classrooms, a church parlour, and a minister's vestry. The site, comprising 1,777 square yards, has cost £1,510, and the total cost was slightly over £7,000.

The Wesleyan Chapel Committee, at their recent meeting in Manchester, considered some thirty cases of proposed new erections in various parts of the country, involving an estimated expenditure of £44,220.

The new Municipal Technical School, Oldham, was opened on Monday. The building is situated in Ascroft-street, contains provision for 2,000 students, and it will have cost, when entirely completed, about £12,000. This is irrespective of the machinery and apparatus, the expenditure on the latter having been very greatly lessened by a generous gift of machinery.

The Parks and Galleries Committee of Glasgow Town Council, to whom remits were made regarding the proposed Exhibition in 1901, met on Monday and agreed that, after the guarantee fund amounted to £50,000, steps should be taken to form an Exhibition Association to carry out the project.

The City Commissioners of Sewers have, on the recommendation of the Finance and Improvement Committee, adopted an arrangement for acquiring the leasehold interest in No. 4A, Cheapside, and 1A, Paternoster-row, for £7,750. A sum of £8,055 has been ordered to be paid for the freehold and leasehold interests in 101, Fleet-street, in respect of the ground thrown into the public way for the commencement of the widening of the street.

Lord Mostyn, as a Jubilee gift, has presented Llandudno with a site valued at £5,000, for municipal buildings.

A marble bust of the late Master of Balliol has been placed in the gallery of the Bodleian Library at Oxford by the Jowett Memorial Committee.

At the meeting of the Walsall Town Council on Friday, the Mayor reported the offer as Jubilee gifts of presents, "A Chat by the Way," by Mr. W. Bayliss; a water colour, "Over the Border,"—a rendering of Shere Parish Church, near Guildford—by Mr. John Fullwood, by Mr. E. J. Shaw; an oil painting by Creswick, by Councillor and Mrs. Hughes; and a water-colour drawing by the children of Councillor and Mrs. Hughes, as contributions towards the art gallery. The gifts were gratefully accepted.

The pleasure pier which is in course of construction at the Mumbles is making good progress. It is to run out 300 yards, with four spans, and be 25ft. wide. It will stand 9ft. above high-water mark, and will enable pleasure steamers of 9ft. draught to go alongside at low-water spring tide. At the extremity will be a pavilion, and there will also be refreshment-room accommodation. About 375ft. of the trellis-work stands has been erected, and all the columns which will rest on the sands fixed. The remainder will be driven into the solid rocks, and Lady Jenkins performed on Monday the ceremony of driving the screw of the first of these columns into the rock.

The new district church of St. Columba at Gateshead was consecrated on the 9th inst.

Mr. J. Douglass Maheux, C.C., F.R.I.B.A., has been elected a member of the governing body of the London Diocesan Church Schools Association under the Voluntary Schools Act, 1897.

Mr. Henry Clarke, C.C., has commissioned Mr. A. C. Gow, R.A., to paint the picture of her Majesty at St. Paul's, which, when completed, will be presented by him to the City Corporation Art Gallery. The scene will be depicted from the south-west corner of the cathedral front, near Queen Anne's statue. The canvas will be about 8ft. long, and is intended to be finished for exhibition in the Royal Academy of 1899, after which it will find a home at the Guildhall.

St. Mary's Roman Catholic Church, King's Lynn, erected in 1844, was recently condemned as unsafe, and has been demolished and rebuilt from the foundations. The new building is decorated in style, and is faced with Carr stone, Bath stone being employed for dressings. The building consists of nave, chancel, and Lady-chapel. Mr. W. Lunn, of Malvern, was the architect, and Mr. W. Hubbard, of Dereham, the builder. The cost has been about £2,000.

## Trade News.

## WAGES MOVEMENTS.

**ACTON, W.**—Several hundred men employed in the brickyards at Acton and Shepherd's-bush, near London, have gone on strike for an advance of wages all round. The brickmakers have hitherto been paid 5s. 3d. per 1,000; they demand 5s. 9d. The other men demand a proportionate advance.

**BUILDERS' LABOURERS' UNION.—CONFERENCE AT LEICESTER.**—During the past week the annual conference of the Builders' Labourers' Union was held at Leicester, 43 towns being represented by delegates, and on Friday evening a public meeting was convened at the Albert Coffee House, when addresses were delivered by a number of the delegates to the conference. Mr. T. Stevens, of Leicester, presided, and there was a good attendance. Mr. Judd, of Leeds, moved the following resolution: "That this meeting, recognising the difficulty we have in maintaining our trade customs on public works, hereby pledges itself to redouble its efforts to organise all workers in their respective unions." He said that in the past working men had been satisfied to put on public bodies any capitalist or employer of labour who chose to offer himself for election. Unless they placed working men on the town councils of the country, how were they going to get the benefits of such measures as the Artisans' Dwellings Act? It had not been taken advantage of in hardly any town, because their representatives were property-owners and builders. Were they likely to build houses which they could let for 4s. or 5s. a week when they could get 6s. or 7s. for them if they built them themselves? Mr. G. Payne, of the Bricklayers' Union, seconded, and said that as the result of the labours of unions, the workmen in 40 towns had gained advantages. Six towns had got an increase of a penny per hour, 22 had got a half-penny, and three a farthing, and nine had improved conditions, and yet last year they spent over £350 less in disputes than in the previous 12 months. Mr. Payne advocated the formation of a national trades federation. Mr. Flannigan and Councillor Belt, of Hull, Mr. J. Moore and Mr. A. J. Smith, of Leicester, having supported the resolution, it was carried.

**CARLISLE.**—The joiners employed at Carlisle, who came out on strike six weeks ago, resumed work on Monday. The men struck for an advance of 4d. an hour and the reduction of their hours of labour to the extent of four hours in summer and seven hours in winter, making the number of hours of work weekly 50 in summer and 47 in winter, instead of 54 all the year round. The terms on which they have resumed work are an advance of 4d. per hour and the reduction in the hours of work demanded. Formerly the men working 54 hours a week at 7½d. earned £1 12s. 7½d. all the year round; now, with the reduced hours and the advance per hour, they will receive £1 12s. 3½d. per week in summer and £1 10s. 4½d. in winter.

**CONDITION OF TRADE.**—The Labour Department reported that during May the state of employment has continued to improve, the proportion of trade-unionists returned as unemployed being less than in any month since the summer of 1890. In the 113 trade-unions making returns, with an aggregate membership of 460,635, 10,418 (or 2·2 per cent.) were reported as unemployed at the end of May, compared with 2·5 per cent. in April, and with 3·3 per cent. in the 110 unions, with a membership of 422,194, from which returns were received for May, 1896. Employment in the building trades has continued brisk. The percentage of unemployed in unions making returns for May was only 0·8, compared with 1·0 in April, and with 1·6 in May, 1896. The furnishing trades show a slight falling-off, though still busy. The percentage of unemployed union members at the end of May was 1·1, compared with 0·5 in April, and 1·1 per cent. at the end of May, 1896. Changes in rates of wages, affecting about 35,200 workpeople, were reported during May, of which number about 33,440 received increases and 60 sustained decreases. The net result of these changes is an advance estimated at 1s. 9½d. per head on the weekly wages of those affected. The increases include 8,700 building trade operatives, 19,750 workpeople engaged in the metal, engineering, and shipbuilding trades, and 3,050 workpeople in the furnishing and wood-working trades. Forty disputes took place in the building trades during May, and seven in the furnishing and woodworking trades.

**CRIEFF.**—The strike of the operative masons of Crieff, which began on Monday in last week in consequence of the refusal of the masters to comply with their demands, came to an end on the Friday, owing to one of the masters having signed the men's conditions. These conditions are a standard rate of wages of 8d. per hour for twelve months from June 1; that the builders receive 4d. per hour where there is no shed accommodation during wet weather; that in the case of country work 4d. per hour be paid above two miles, and 3s. per week above three

miles, from the Square of Crieff; and, further, that the employers provide hot-plate and fuel to prepare tea or coffee in a proper manner, and in all cases wages to be paid before stopping-time, whether at yard or job.

**DUNDEE.**—The lathesplitters have made a demand for an advance on their present wages of 4d. per hour, to take effect on August 23. The present rate of pay is 7½d. per hour.

**EXETER.**—The master builders of Exeter and district recently received a notice from their employees asking for a reduction of working hours, an increase of one penny per hour, or bricklayers and walling masons 8d. per hour, plasterers and carpenters 7½d. per hour, labourers 5½d. per hour; no builder to take more than one apprentice in two years; and 6d. per day country money in addition to their lodging money. The builders appointed a deputation to meet the employees, who endeavoured to settle the points in question. The masters offered to refer the whole of the matters to arbitration. This was refused. They then, without prejudice, offered an increase of 4d. per hour to the employees, and to give the 6d. per day country money, but could not agree to a reduction of working hours or submit to any further restrictions as to the number of apprentices which they might think fit to engage. The employees refused this offer, and adhered to their original demands as to the number of working hours and the increase of one penny per hour. The masters again offer to submit the whole matters in dispute to arbitration.

**IPSWICH.**—The strike in the building trade is still unsettled, and though jobs can proceed a considerable distance without carpenters, the time comes when the whole building work must stand still if woodwork cannot be procured and fixed.

**OXFORD.**—In the absence of a settlement of the recent dispute between the builders in this city and the carpenters and joiners, the men ceased work on Saturday last, and are still out on strike. The demand of the employees is for an increase of wages from 7½d. to 8d., and the men further desire the signatures of the builders to the code of working rules fixed by the late conciliation board of which Sir William Markby was chairman. The rules were signed by many employers at the time of their adoption; but the contract then entered into between the contending parties has long since come to an end, and it is now sought to again put the rules in force. Owing to contingencies that have arisen in the interim, there is no longer any combination or organisation amongst the builders, and the Master Builders' Association formed at the time of the inception of the conciliation board has been allowed to die a natural death. The employers have strong objections to the principle of a standard rate of wages. The number of men out on strike is said to be about 120.

**NEWCASTLE-ON-TYNE.**—A meeting of the Newcastle and District Stonemason's Society was held at the White Swan, Cloth Market, Newcastle, on Monday night, under the presidency of Councillor W. Flynn. It was reported that Mr. J. Elliott, of North Shields, had written to the Society conceding the men's demands for an eight hours' day. Thus 80 or 90 of the men who had come out on strike have now returned to work owing to the concessions of different employers. It was also announced that the Employers' Association had written to the Society asking for a deputation to wait upon them. It was agreed to meet the employers as requested, so that in all probability the strike will be ended this week.

A face which will be missed by members of Parliament next session is that of Mr. Prim, the superintendent of the lighting, heating, and ventilating department at Westminster, who retires this year upon a pension.

The Glasgow Corporation adopted on Monday a recommendation by their fire brigade committee regarding the acquisition of ground in Ingram-street for a new central fire-station, that the city engineer be authorised to prepare sketch plans of the new station, and that a deputation, consisting of two members of the sub-committee, along with the city engineer and the chief officer of the brigade, be appointed to inspect several of the principal fire-stations in the kingdom, including those in London, Leeds, and Belfast, with the view of acquiring information regarding the most recent improvements in use in those stations.

A bathing pond, from plans prepared by Messrs. Buchanan and Bennet, C.E., Edinburgh, has just been constructed on the west beach, Pittenweem. The pond, which will be available at any time of tide, has been formed in a gully running from the beach seaward. At a point 320ft. from high-water mark a concrete rubble wall, 60ft. in length and 6ft. high has been erected between ridges of rock which form each side of the pond, which retains the water at each receding tide. When full it is 230ft. in length, 140ft. of which is from 3ft. to 9ft. in depth, the remaining 90ft. shallowing to the beach.



## LIST OF COMPETITIONS OPEN.

Gloucester—Fever Hospital	£100 (merged), £50, and £30	G. S. Blakeway, City Clerk, Gloucester	June 24
West Hartlepool—Laying out Burn Valley Pleasure Gardens	£10	J. W. Brown, Borough Engineer, West Hartlepool	29
Hereford—Suspension Footbridge over River Wye (£1,200 limit)	£10	F. W. Meats, Hon. Sec., Bridge Committee, Hereford	30
Elne, France—Water Supply Scheme (3,300 inhabitants)	£20 (merged) and £10	La Marie, Elne, Pyrénées Orientales	July 1
Howth—Presbyterian Church	30gs. (merged), 20gs.	Rev. James Wilson, 4, Rhoda Villas, Howth, Co. Dublin	20
Rugby—Municipal Buildings (no Assessor)	50gs., 30gs., 20gs.	D. G. Macdonald, Surveyor, Rugby	21
Bootle—Technical School, Balliol-road (£15,000 limit)	£75, £50, £25	J. A. Crowther, Borough Engineer, Bootle	31
Bury, Lancs.—Art Gallery and Public Library (£16,000 limit)	£100, £50, £25	John Haslam, Town Clerk, Bury, Lancs.	Aug. 31
Carlton, Victoria—Children's Hospital	£25, £10	J. Nicholson, Hon. Sec., Pelham-street, Carlton, Australia	(1898) Jan. 30
Chesterfield—Enlarging Stephenson Memorial Hall (£3,500 limit)	£10	Borough Surveyor, Salter Gate, Chesterfield	—
Wadhurst, Tunbridge Wells—Vicarage Hall (£1,500 limit)	£150, £100, and £30	Secretary Jubilee Committee, Wadhurst, Kent	—
Hereford—Bridge over Wye (£1,200 limit)	£500 (merged), £300, £200	T. W. Meats, Secretary Jubilee Bridge Committee, Hereford	—
Huddersfield—Jubilee Tower on Castle Hill		Secretary Jubilee Committee, Town Hall, Huddersfield	—
Kirkham—New Workhouse for 300 inmates		J. Thompson, Clerk to Fyde Board of Guardians, Kirkham, Lancs.	—
Brighton—Artisans' Dwellings (local Architects only)		F. J. Tillstone, Town Clerk, Brighton	—
Cardiff—Town Hall and Law Courts		The Town Clerk, Cardiff	—
Boscombe—Hospital Enlargement, Shelley-road		J. Pratt, Assistant Sec., 126, Christchurch-road, Boscombe	—

## LIST OF TENDERS OPEN.

## BUILDINGS.

Great Yarmouth—Boys' School, Peter's-road	School Board	Bottle and Olley, Architects, Queen-street, Yarmouth	June 19
Whittington—Congregational Chapel	Earl Wharncliffe	Minshull and Jones, Oswestry	19
Tintagel—House at Treburwith Farm	Conssett Iron Co.	Wise and Wise, Architects, Launceston	19
Kilmallock—Schoolhouse and Residence	Co-operative Society	E. Fogarty, Architect, Henry-street, Limerick	19
Chopwell—Three Houses	School Board	Secretary to Co., Blackhill, Co. Durham	19
Ennerdale Bridge—Rebuilding Dog and Gun Inn	Board of Guardians	E. Jackson, Architect, Tangier Buildings, Whitehaven	19
Denny, N.B.—Thirty-six Small Houses	Conssett Iron Co.	R. M'Leand, Architect, Motherwell-road, Belshill	19
Dalmally, N.B.—House	W. R. Armstrong	J. Macdonald, Fernbank, Dalmally	19
Great Yarmouth—Additions to George's School	Harvey and Risk	Bottle and Olley, Architects, Queen-street, Yarmouth	19
Oswestry—Alterations to Conservative Club	C. Jones	Shaylor and Madoc-Jones, Architects, 19, Church-street, Oswestry	19
Newcastle-on-Tyne—Repairs to Union Offices, Pilgrim-street	School Board	J. W. Gibson, Clerk, Pilgrim-street, Newcastle	19
Paignton—Watch Tower at Oldway	Board of Guardians	P. E. Singer, Oldway, Paignton	19
High Spenn—Thirteen Cottages	Conssett Iron Co.	Secretary to Co., Blackhill, Co. Durham	19
Castleford—Additions to Wesleyan Chapel, Duke-street	W. O. Rooper, Hon. Sec., Restoration Committee, Penkridge	G. F. Pennington, M.S.A., Central Chambers, Castleford	19
Spenn—House at Hooker Gate	E. Bowman, Architect, County Chambers, Newcastle	T. C. Nicholson, F.R.I.B.A., Blaydon	19
Penkridge—Church Tower Restoration	E. E. Clephan, Architect, St. Nicholas Chambers, Newcastle	W. O. Rooper, Hon. Sec., Restoration Committee, Penkridge	19
Gateshead—Alterations to Premises	T. H. Hogg, Architect, 35, Cunliffe-street, Rhosddu	E. Bowman, Architect, County Chambers, Newcastle	19
Gateshead—Mission Church and Vicarage, Saltwell-lane	T. H. and F. Healey, 42, Tyrell-street, Bradford	E. E. Clephan, Architect, St. Nicholas Chambers, Newcastle	19
Rhosddu—Two Houses	Barrow Rule, Clerk, Katherine-street, Croydon	T. H. Hogg, Architect, 35, Cunliffe-street, Rhosddu	19
Otley—Congregational Church	W. G. Scott and Co., Architects, Victoria Buildings, Workington	T. H. and F. Healey, 42, Tyrell-street, Bradford	19
Croydon—Additions, Morland-road Schools, Woodside	J. Stallebrass, Architect, North-street, Peterborough	Barrow Rule, Clerk, Katherine-street, Croydon	19
Workington—Four Houses, Berwick-street	G. Muirhead, Haddo House Estate Office, Aberdeen	W. G. Scott and Co., Architects, Victoria Buildings, Workington	19
Peterborough—Baths at Workhouse	Barrow Rule, Clerk, Katherine-street, Croydon	J. Stallebrass, Architect, North-street, Peterborough	19
Methilich—Byre, Cart-Shed, &c.	Elijah Jones, M.S.A., 10, Albion-street, Hanley	G. Muirhead, Haddo House Estate Office, Aberdeen	19
Croydon—Repairs (Triennial), All Schools	G. J. Hunter, Secretary, Wheatley-hill, Haswell	Barrow Rule, Clerk, Katherine-street, Croydon	19
Hanley—Wesleyan School Chapel, Cauldon-road	E. Jenkin Williams, M.S.A., 14, High-street, Cardiff	Elijah Jones, M.S.A., 10, Albion-street, Hanley	19
Haswell—Alterations to Premises	Simpson and Duckworth, Architects, Richmond Chambers, Blackburn	G. J. Hunter, Secretary, Wheatley-hill, Haswell	19
Bridgend—Additions, Tremain House	E. H. Harbottle, F.R.I.B.A., Exeter	E. Jenkin Williams, M.S.A., 14, High-street, Cardiff	19
Blackburn—Steam Bakery and Stables, Blakey-street	T. A. Cressy, Architect, Clacton-on-Sea	Simpson and Duckworth, Architects, Richmond Chambers, Blackburn	19
Aylesbeare—Restoring and Re-seating Church	Evan Lewis, Torgelly Farm, Llanharry	E. H. Harbottle, F.R.I.B.A., Exeter	19
St. Osyth, Essex—Additions to National School	A. E. Rhodes, Architect, Cheapside, Heckmondwike	T. A. Cressy, Architect, Clacton-on-Sea	21
Brynsadler—Five Houses	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	Evan Lewis, Torgelly Farm, Llanharry	21
Staincliffe—Ten Houses and a Shop	Davies and Moss, Architects, 11, Regent-street, Wrexham	A. E. Rhodes, Architect, Cheapside, Heckmondwike	21
St. Ilybridge—Eight Shops and Houses	R. Whitbread, M.S.A., Carlton, Nottingham	Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	21
Pentre Broughton—Methodist Free School	G. D. Oliver, F.R.I.B.A., 5, Lowther-street, Carlisle	Davies and Moss, Architects, 11, Regent-street, Wrexham	21
Carlton, Nottingham—Co-operative Stores	Eade and Johns, Architects, Cornhill Chambers, Ipswich	R. Whitbread, M.S.A., Carlton, Nottingham	21
Carlisle—Additions to Grammar School	A. Macpherson, Architect, Tenant-street, Derby	G. D. Oliver, F.R.I.B.A., 5, Lowther-street, Carlisle	21
Muldon—Alterations to Wesleyan Chapel	J. E. S. Olive, Clerk, 24, Hamilton-terrace, Birkenhead	Eade and Johns, Architects, Cornhill Chambers, Ipswich	21
Derby—Additions, Orchard-street Board School	D. Storrar, Architect, Cupar, Fife	A. Macpherson, Architect, Tenant-street, Derby	21
Clatterbridge—Chapel and Lecture-hall at Workhouse	Demaine and Brierley, Architects, 13, Lendal, York	J. E. S. Olive, Clerk, 24, Hamilton-terrace, Birkenhead	21
Logie, N.B.—Restoring Six Houses	A. W. Kinnear, Solicitor, Stonehaven	D. Storrar, Architect, Cupar, Fife	21
Pocklington—Kitchen Wing at Grammar School	Wilson and Duffres, Advocates, Aberdeen	Demaine and Brierley, Architects, 13, Lendal, York	22
Cairnton, Fordown—Alterations, Farmsteadings		A. W. Kinnear, Solicitor, Stonehaven	22
Foveran—Four Offices, Auchnacant		Wilson and Duffres, Advocates, Aberdeen	22
Leigh, Lancs.—Brick Chimney (120ft. high), Mather-lane			
Sewage Works	Joint Sewerage Board	D. Schofield, Clerk, Atherton	23
Glasgow—Additions, Merryflats Hospital	Hackney Board of Guardians	A. Wallace, 7, Carlton-place, Glasgow	23
Homerton—Additions to Workhouse Master's Office	Corporation	F. R. Coles, Clerk, Homerton, N.E.	23
Alnwick—Enlargement, St. John's School, Howick-street	Equitable Co-operative Society	M. Temple Wilson, Architect, 69, Narrowgate, Alnwick	23
Rafford—Additions to Steading at Farm	Ystradyfodwg School Board	J. Duncan and Sons, Architects, Turf	23
Colne—Chimney (210ft. high) at Refuse Destructor, Burnley-road	Duke of Leeds	T. H. Hartley, Borough Surveyor, Town Hall, Colne	23
Leven, N.B.—Hotel	Harbour Trustees	J. Guthrie, Solicitor, High-street, Kirkcaldy	23
Blervie—Additions to House and Steading	Lambeth Vestry	J. Duncan and Sons, Architects, Turf	23
Stenhousemair—Shops and Stores	Royal Insurance Company	J. Strang, Architect, 102, High-street, Falkirk	24
Pentre—Additions to Ferndale Schools	Rowland Smith	J. Rees, Architect, Pentre	24
Sowerby Bridge—Alterations to Wesleyan Chapel	F. Williams	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	24
Darlington—Additions, Rudd Hall	Corporation	Clark and Moscrop, Architects, Darlington	24
Swansea—Brick Chimney (100ft. high), South Dock Lock	Derbyshire Asylum Visitors	A. O. Schenck, Engineer, Harbour Offices, Swansea	24
Tooting—Repairs to Cemetery Buildings	Glasgow Central Railway	H. J. Smith, Vestry Clerk, Kennington Green, S.W.	24
Kendal—Repairing Museum Buildings	T. G. Hughes	S. Shaw, F.R.I.B.A., Kendal	24
Liverpool—Offices, North John-street	Managers	J. F. Doyle, Architect, 4, Harrington-street, Liverpool	24
Kingswear—Additions, Redoubt House	Rev. F. Dogherty	W. F. Tollit, Gate House, Totnes	24
Budleigh Salterton—Additions to The Firs	Urban District Council	E. H. Harbottle, F.R.I.B.A., County Chambers, Exeter	24
Hull—Electric-Light Buildings	Derbyshire Asylum Visitors	A. E. White, Borough Engineer, Hull	24
Sowerby Bridge—Additions to Bolton Brow Wesleyan Chapel	G. V. Mainprize	A. G. Dalzell, Architect, Elland-road, Brighouse	24
Salford—Block 66 Artisans' Dwellings	Managers	S. Brown, Town Clerk, Salford	24
Mickleover Asylum—Two Cottages	Gas Co.	B. S. Carrey, Clerk, St. Michael's Churchyard, Derby	25
Northwram—Additions to Mechanics' Institute	Wm. Ross	J. F. Walsh, Architect, Bank Chambers, Halifax	25
Glasgow—Central Low-Level Station	School Board	J. Blackburn, Secretary, 302, Buchanan-street, Glasgow	25
Bangor—Stores and House, Sackville-road	Corporation	R. Davies, Architect, Bangor	25
Barnsley—Two Houses, Gawber-road	Bridge Trustees	H. Crawshaw, Architect, Barnsley	25
Abergavenny—Additions, Castle-street School	School Board	E. A. Johnson, M.S.A., Abergavenny	25
Auher—Alterations to House	Board of Guardians	Thos. Elliott, Architect, Auher, Co. Tyrone	25
Dufftown—Offices, Mortlach Distillery	Bucklow Board of Guardians	C. C. Doig, Architect, Elgin	25
Hampton-on-Thames—Sewage Outfall Buildings	Gloucester Farmers' Club	F. A. Kent, Clerk, Hampton	25
Mickleover Asylum—Teak and Oak Flooring		B. S. Carrey, Clerk, St. Michael's Churchyard, Derby	25
Bridlington—Six Houses and Shop, Quay-road		S. Dyer, Architect, Bridlington Quay	26
Bals—Classrooms, &c., at County School		R. Lloyd Jones, Architect, Mount-place, Bala	26
Bridlington—Brick Gasholder Tank (102ft. dia., 25ft. deep)		T. Newbigging and Son, Engineers, Manchester	26
Corham—Additions to Manor House		T. Holloway, Chippenham	26
Torphis—House at Annesley		Jenkins and Marr, Architects, Bridge-street, Aberdeen	26
Wigan—Primitive Methodist School		J. B. Thornley, Architect, Powell's Chambers, Wigan	26
Tong, Yorks—New School, Highfield		W. and J. B. Bailey, Architects, 9, Market-street, Bradford	26
Dover—Car-Shed, Buckland		H. E. Stigoe, Borough Engineer, Town Hall, Dover	26
Richmond, Yorks—Three Houses		J. Axleby, Architect, Wilton-lane, Masborough	26
Dover—Car Shed, Buckland		E. W. Knocker, Town Clerk, Dover	26
Bideford—Repairs to House, Bridgland-street		C. W. Hole, Bridge Steward, Bideford	26
Kimbermouth—Four Houses		J. Axleby, Architect, Wilton-lane, Masborough	26
Tong, Yorks—Additions, Westgate Hill, School		W. and J. B. Bailey, Architects, 9, Market-street, Bradford	26
Nottingham—Workhouse, Excavating and Foundations		G. M. Howard, Clerk, Poor Law Offices, Nottingham	26
Knutsford—Offices and Board-room		G. Leigh, Clerk, Union Offices, Knutsford	26
Bristol—Grand Stand for 800 persons at Fishponds		Secretary, 3, Broad-street, Bristol	26



## BUILDINGS—continued.

Beamish—Sixteen Houses	Industrial Provident Society	T. E. Crossling, Architect, Front-street, Stanley	June 30
Oxford—Alterations to Fish and Meat Markets	Corporation	R. Bacon, Town Clerk, Oxford	" 30
Waterford—39 Labourers' Cottages, Doyle's-lane	Corporation	J. J. Freely, Town Clerk, Waterford	July 1
Middlewich—Technical Schools and Free Library	Urban District Council	R. T. Worth, A.M.I.C.E., Town Hall, Middlewich	" 1
Lisguggan Little—35 Labourers' Cottages	Waterford Corporation	J. J. Freely, Town Clerk, Waterford	" 1
Merstham—School, Nutfield-road	Merstham School Board	W. Haben, School Board Offices, Merstham	" 1
Halifax—Foundry Mill, Water-lane	Duke of Northumberland	Medley Hall, Architect, 20, Northgate, Halifax	" 2
Alnwick—Three Blocks of Cottages, Wagonway-road	Commissioners	C. E. Moore, <i>Gazette</i> Office, Alnwick	" 3
Enniskillen—Town Hall	School Board	Wm. Cleland, Town Clerk, Enniskillen	" 5
Porth—Additions to County School	Corporation	J. Rees, Architect, Hillside House, Pentre	" 5
Luton—Schools, Dunstable-road	Corporation	W. Hoyle, Clerk, Waller-street, Luton	" 5
Douglas—Municipal Buildings, Ridgway-street	Corporation	A. Ardron, F.R.I.B.A., 39, Victoria-street, S.W.	" 7
Conway—Market and Public Hall	Urban District Council	T. B. Furrington, Borough Engineer, Conway	" 7
Baslow—Twelve Workmen's Cottages	F. W. P. Orchard	V. R. Cockerton, Clerk, Baslow	" 19
Flanshaw—Reseating Congregational Chapel	Kerley and Ellis, Architects, Exmouth	A. Hart, Architect, 21, Barstow-square, Wakefield	"
Exmouth—Two Shops, Exeter-road	T. D. Lindsay, Architect, Ashton-under-Lyne	T. George and Son, Old-square, Ashton-under-Lyne	"
Ashton-under-Lyne—Spinning Sheds, Oxford Mills	E. C. H. Maidman, Architect, 15, South Charlotte-street, Edinburgh	Bromet and Thorman, Architects, Tadcaster	"
Colington, Edinburgh—Villa	Empsall and Clarkson, Architects, 7, Exchange, Bradford	E. J. Toye, Architect, Strand, Derry	"
Denaby—St. Alban's Church and Presbytery	W. H. Walley, Architect, Burslem	Secretary, St. George's College, Adlestone	"
Chesham—Additions to Workhouse	Jas. Bunce, Turners Hill, Cheshunt	F. Watts, 27, Lordship-lane, Tottenham	"
Chesham—Three Villas	F. H. Goddard, Architect, Lincoln	T. Brownlow Thompson, Architect, 15, Parliament-street, Hull	"
Bracebridge—Additions to Asylum	T. George and Son, Old-square, Ashton-under-Lyne	A. J. Wilsdon, John-street, Kilkenny	"
Ashton-under-Lyne—Two Houses in Fraser-street	E. R. Ridgway, M.S.A., Long Eaton	T. George and Son, Old-square, Ashton-under-Lyne	"
Kippax—Boys' School	George Hobson, Witton Gilbert, Co. Durham	E. R. Ridgway, M.S.A., Long Eaton	"
Augebrack—Finishing Church	Jas. Hart, Architect, Corby, Grantham	Geo. Bland, Architect, Harrogate	"
Addlestone—Additions to Collegiate Building	A. Wyatt, 97, High-street, Poole	J. A. York, Solicitor, Barnard Castle	"
Tottenham—117 Cottages	F. H. Cooke, Surveyor, Peterborough	E. Rogers, Trelowarren-street, Camborne	"
Hull—Additions to Stepney Paper Mills	T. George and Son, Old-square, Ashton-under-Lyne	E. R. Ridgway, M.S.A., Long Eaton	"
Kilkenny—Additions to Royal Oak Inn	Hicks and Charlewood, Architects, 42, Grainger-st., Newcastle-on-Tyne	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	"
Ashton-under-Lyne—Three Houses in Carrier-lane	E. R. Ridgway, M.S.A., Long Eaton	Opie's Temperance Hotel, Penzance	"
Stapleford—Two Shops	Geo. Bland, Architect, Harrogate	F. Moore, 40, Sundridge-road, Bradford	"
Witton Gilbert—Eight Houses	J. A. York, Solicitor, Barnard Castle	C. F. Watson, Grey Southern, Cockermouth	"
Ilkeston—Schools, Regent-street	E. Rogers, Trelowarren-street, Camborne	E. R. Ridgway, M.S.A., Long Eaton	"
Poole—Two Semi-Detached Villas	E. R. Ridgway, M.S.A., Long Eaton	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	"
Peterborough—Three Houses at Fareet	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	F. Moore, 40, Sundridge-road, Bradford	"
Ashton-under-Lyne—House in Grafton-street	E. A. Johnson, M.S.A., Abergavenny	C. H. Openshaw, Architect, Fleet-street, Bury, Lancs.	"
Terrington St. Clement—Church Restoration	W. H. Higginbotham, Architect, King John's Chambers, Nottingham	J. Stockwell, Architect, 11, Pilgrim-street, Newcastle	"
Long Eaton—Nine Villas and Shop, Scoley-road	J. Stockwell, Architect, 11, Pilgrim-street, Newcastle	W. H. Sharp, Architect, 229, Rooley-lane, Bradford	"
Poole—Two Semi-Detached Villas	A. D. Calvert, Architect, 18, Low-pavement, Nottingham	J. R. Townsend, 21, Fargate, Sheffield	"
Pateley Moor—Farmhouse	Empsall and Clarkson, Architects, 7, Exchange, Bradford	Johnstone Brothers, Architects, 39, Lowther-street, Carlisle	"
Newsham—Re-erection of Farm Buildings	Phil Stohoe, 71, Durham-road, Blackpine	G. A. Hammond, Architect, Rochdale	"
Camborne—Five-roomed House, College-row	G. A. Hammond, Architect, Rochdale	W. Broadbent, 11, St. Ann's Mount, Burley, Leeds	"
Long Eaton—34 Semi-Detached Houses, Beaconsfield-street	W. Broadbent, 11, St. Ann's Mount, Burley, Leeds	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	"
Carlisle—Hayton Hall and Reading-room	Jas. Jamieson, Architect, 2, Commerce-street, Elgin	F. H. Harvey, 183, Lavender Hill, S.W.	"
Marazion—House	C. Parsons, Architect, Burnley	A. Gorton, Architect, 10, Morecambe-street, Morecambe	"
Bradford—Four Through Houses, Newark-street	W. Dodsley, Architect, Mansfield	W. T. Ganson and Son, Architects, 10, Marsden-street, Manchester	"
Maryport—Washhouses	W. T. Ganson and Son, Architects, 10, Marsden-street, Manchester	T. F. Hutchinson, Secretary, Peel House, Leyland	"
Long Eaton—24 Houses, Salisbury-street	T. F. Hutchinson, Secretary, Peel House, Leyland	Owner, Newton House, Newton-street, Rotherham	"
Ilkeston—Enlargement of Primitive Methodist Chapel	A. Hill, F.R.I.B.A., 22, George's-street, Cork	M. F. W. Austin, 20, Cheapside, E.C.	"
Gateshead—Factory, The Teams	W. J. Abel, Clerk, Victoria-street, Nottingham	C. E. Butcher, Architect, 3, Queen-street, Colchester	"
Carlisle—Alterations to 23, Warwick-road	C. E. Butcher, Architect, 3, Queen-street, Colchester	Mawson and Hudson, 2, Exchange Buildings, Bradford	"
Bradford—Additions, Hope and Anchor Hotel, Park-road	Mawson and Hudson, 2, Exchange Buildings, Bradford	Gordon and Lowther, Architects, Finsbury House, E.C.	"
Blaenavon—Additions, Wain Hotel	Gordon and Lowther, Architects, Finsbury House, E.C.	G. E. Bolshaw, Architect, 189, Lord-street, Southport	"
Bowles—Rebuilding Jolly Butcher Inn	J. W. Rounthwaite, A.R.I.B.A., 13, Mosley-street, Newcastle	W. J. Abel, Clerk, Victoria-street, Nottingham	"
Beeston—Four Houses	W. J. Abel, Clerk, Victoria-street, Nottingham	E. Rogers, Trelowarren-street, Camborne	"
Whitby—Eight Houses	E. Rogers, Trelowarren-street, Camborne	Gelder and Kitcher, Architects, 76, Lowgate, Hull	"
Bradford—Four Houses, West Bowling	Gelder and Kitcher, Architects, 76, Lowgate, Hull	Habershon and Fawcner, Architects, Pearl-street, Roath	"
Ruddington, Notts—Alterations to Premises	Habershon and Fawcner, Architects, Pearl-street, Roath	J. W. Martin, Architect, Station Chambers, Clacton-on-Sea	"
Pittsmoor—Two Houses	J. W. Martin, Architect, Station Chambers, Clacton-on-Sea	H. Sykes, M.S.A., Ann-street, Belfast	"
Denaby Main—St. Alban's Church and Presbytery	H. Sykes, M.S.A., Ann-street, Belfast	W. J. Fennell, Architect, 11, Chichester-street, Belfast	"
Carlisle—Villa, Dalston-road	W. J. Fennell, Architect, 11, Chichester-street, Belfast	F. Matcham, Architect, 9, Warwick-lane, Holborn, W.C.	"
Blackpine—Four Cottages	F. Matcham, Architect, 9, Warwick-lane, Holborn, W.C.	C. Parsons, Architect, Burnley	"
Rochdale—Six Houses and Shop, Meanwood Brow	C. Parsons, Architect, Burnley	J. Middleton, Town Clerk, Chesterfield	"
Leeds—Ten Houses and Two Shops, Lowood-street	J. Middleton, Town Clerk, Chesterfield		"
Huntly, N.B.—Boot Factory			"
Streatham Hill and Clapham Junction—Completing Nine Houses			"
Lydgate—Alterations to Friendly Inn			"
Morecambe—Ten Houses, Kensington-road			"
Mansfield—Two Houses, St. John-street			"
Ramsay, Isle of Man—Hotel, the Morrigh			"
Penwortham Bridge—Grand Stand			"
Rotherham—Five Houses, Newton-street			"
Skibbereen—Residence			"
Woking—Conservative Club, Commercial-road			"
Nottingham—Alterations to Huntingdon-street Schools			"
Goldhanger—Farm Buildings			"
Erizinghall, Bradford—Loom Works			"
Fordham—Public Hall and Institute			"
Buckley—United Free Methodist Chapel			"
Burnopfield—Alterations to Premises			"
Nottingham—Additions to Clarendon-road Schools			"
Camborne—House in College-row			"
Doncaster—Boot Shop, St. Sepulchre Gate			"
Cardiff—Congregational Church, Richmond-road			"
Clacton-on-Sea—Villa, Thorogood-road			"
Belfast—Shop Fronts, Albert Bridge-road			"
Belfast—Villa and Additions to Factory			"
Leeds—Empire Palace and Shops			"
Comholme, Todmorden—Alterations to Peeping Tom Inn			"
Chesterfield—Additions, Stephenson Memorial Hall			"

## ENGINEERING.

Grangemouth—Gasholder and Tank	Gas Co.	W. M. Anderson, Solicitor, Grangemouth	June 19
Penmon—Sea Wall	Aethy Rural District Council	E. B. Evans, Clerk, Union Offices, Bangor	" 19
Horsforth—Water Mains, Calverley-lane	Waterworks Co.	C. Roberts, Secretary, High-street, Horsforth	" 21
Queenstown—Waterworks	Sanitary Authority	J. H. Campbell, Clerk, Town Hall, Queenstown	" 21
Linthouse—Graving Dock, Union Docks	Corporation	W. Jaffroy, M.Inst.C.E., 3, Victoria-street, S.W.	" 21
Coventry—Heating, &c., Police Buildings	Great Western Railway Co.	H. Quick, Architect, 64, Hertford-street, Coventry	" 22
Brimcombe—Station Extension	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 22
Wootton Bassett and Patching—Railway (333 long)	Calder District Committee	G. K. Mills, Secretary, Paddington Station, W.	" 22
Bellsquarry, N.B.—C.I. Pipes (4in. dia., 7,000 yards)	Metropolitan Asylums Board	A. G. G. Asher, County Clerk, Edinburgh	" 23
Foyers—Drainage and Water Supply	Urban District Council	C. B. Manners, C.E., Inverness	" 23
Tooting—Cooling Apparatus, Grove Hospital	Metropolitan Asylums Board	A. H. Tiltman, Architect, 6, John-street, Bedford-row	" 23
Belper—Water-Supply Works	Stoke Damerel Guardians	G. and F. W. Hodson, Engineers, Loughborough	" 23
Tooting—Electric Lighting, Grove Hospital	Parish Council	A. H. Tiltman, Architect, 6, John-street, Bedford-row	" 24
Devonport—Laundry Machinery	Corporation	A. Gard, Clerk, Devonport	" 24
Treeton—Lighting Town with Electricity	Nantwich Rural District Council	S. Fiske, Clerk, Treeton, Rotherham	" 24
Hull—Electric Lighting Extensions	Pier Co.	A. E. White, Borough Engineer, Town Hall, Hull	" 25
Wistaston—Widening Bridge	Glasgow Corporation	C. E. Speakman, Clerk, Nantwich	" 25
Loosimouth—Repairing Sluices, Loch Spynie Canal	Harbour Trustees	Cooper and Wink, Solicitors, Elgin	" 26
Weston-super-Mare—Pier, Weston Bay	Lanark District Committee	E. Yockney, 46, Queen Anne's-gate, S.W.	" 26
Loch Katrine—Masonry Dam at Outlet	Bucks County Council	J. D. Marwick, Town Clerk, City Chambers, Glasgow	" 30
Irvine—Timber Wharfage (270ft.)	Urban District Council	J. Dickie, Secretary, Council Chambers, Irvine	" 28
Longan Water, N.B.—Reservoir and C.I. Main	Corporation	Leslie and Reid, C.E.'s, 72A, George-street, Edinburgh	" 29
Denham—Watersplash (20ft. span) Bridge	Corporation	R. J. Thomas, County Surveyor, County Hall, Aylesbury	July 1
Diss and Palgrave—Steel Bridge over Waveney	Corporation	Surveyor, Roydon-road, Diss	" 5
Darlington—Gasholder tank (143ft. 6in. dia.)	Corporation	F. T. Stevenson, Town Clerk, Houndgate, Darlington	" 6
Darlington—Three-Lift Gasholder (140ft. dia.)	Corporation	F. T. Stevenson, Town Clerk, Houndgate, Darlington	" 6
Wilton—Steel Girder Bridge over Ouse	Harbour Board	C. Foster, Clerk N.C.C., Shire Hall, Norwich	" 10
Barcelona—Motors and Accumulators	Mayor, &c.	Secretary, Casa Lonja, Barcelona	" 23
Craiova—Water Supply	Gas Co.	The Mairie, Craiova, Roumania	Aug. 28
Thornbury—Relaying Gas Mains (1,120 yards)	Gasworks Co.	S. Fudge, Secretary, Thornbury, Glos.	"
New Romney—Drinking Fountain		W. B. Smith, New Romney, Kent	"
Cronborough—Laying C.I. Pipes (4½ miles)		R. S. Mayne, Secretary, St. Stephen's Chambers, Telegraph-st., E.C.	"
Liverpool—Starch Machinery		023, c/o C. Birchall, Liverpool	"



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### "TIS SIXTY YEARS SINCE."

A GLANCE back at the state of architects and architectural practice at the beginning of this record reign may be pardonable at the present time. Sixty years have done much to consolidate the profession. During the early part of the time it was heterogeneous, and composed of many incoherent elements—amateurs and practical men, archaeologists, builders, and surveyors; but the real architect as we now understand him was scarcely known. As a record of progress, few of the preceding eras can compare with it—we mean in progress from a dull level of art, in which respectable imitation was the highest aim, to our present position of excellence and achievement in technical science and artistic rivalry. Historically, architecture has gone through a cycle of changes: every great style has been reproduced, till we have again taken up the thread of the national art. But we chiefly speak of professional practice, and desire to dwell for a moment on the condition of things at the Accession, the architect of the early Victorian era and his successor of to-day. The comparison will not be flattering to all. The man who looks for an illustrious ancestry in his craft will be somewhat disillusioned; he will note a great change in the *personne*, the social position, and educational equipment of his predecessors of the time—that is, amongst the rank and file of the profession, who were largely made up of men recruited from the trades of masons, carpenters, and plasterers, and who, in many cases, learned the rudiments of their profession at the bench. We do not speak of those who were chiefly literary amateurs and dilettanti, who travelled and wrote books on the Orders and on Classical Antiquities, like Burlington, Horace Walpole, and Dean Aldrich. To this essentially practical class we must look for the tone and character of the time. The literary and the practical were very distinct and strongly marked-off classes; some of the best treatises were written by learned and leisured amateurs, and these became the textbooks and guides. Composed by men who were not practically acquainted with building, these works produced only a fictitious taste for the buildings they described. The architect could only copy the features and details, interpreting them by the knowledge he possessed, and thus we see the Early Gothic imitators applied Classic ideas and rules to Mediæval work. We find him, for instance, using stone for his churches as he had used it for his copies of Greek and Roman buildings; wrought masonry, angle quoins, and the jointing of his arch members were as mechanically regular as the jointing of a Classic building. His pillars were constructed like the columns of the Doric and Corinthian he had been accustomed to use. A perverted idea of architecture was thus introduced. We can easily explain this. If we go back to the earlier years of the century, we shall find a strong archaeological taste setting in. Greek and Roman at first were in possession of the field, and their influence largely helped to shape architectural practice, and to restrict it to certain rules and prescriptions. The designing and building were according to models; the architect was imbued with such works as the "Antiquities of Athens," by Stuart and Revett; by Wilkins's "Antiquities"; Wood's "Discoveries at Ephesus," "The Society of Dilettante Researches"; Penrose's and Cockerell's works. Even his pupils were set

to copy examples set by these masters of the antique, and every building tradesman was confined to the execution of work in which there was no scope whatever for invention. Such treatises as those of Nicholson on carpentry and joinery, or the "Art of Masonry and Stone-Cutting," published early in the century, narrowed those arts down to a number of set problems based on Classic models, roofs, domes, trusses, the setting out of columns and entablatures, quoins, architraves, niches, all of which followed certain rules which were supposed to give the proper proportions, lines, and ornaments of the originals, but which were often mistaken generalisations of what the Greeks and Italians had done. Thus not only were the principles of Greek and Roman applied to the Mediæval buildings, but a formal and very narrow view of architecture was the result of archaeological research. There was little or no scope for individual talent. In Classic work solidity and plainness were qualities of this period, and we have only to look at Bloomsbury, Marylebone, Regent's Park, Kennington, and other parts of London which were built or rebuilt 60 years ago to see evidences of substantial honest building such as it was, good brickwork, good carpentry and joinery, woodwork still solid, which has not shrunk out of their mortises and rebates. The reign of stone and stucco which distinguish the earlier decades of the century has still left its mark in many of our towns. Not only in London, but in Bath and Brighton do we find examples of stone and stucco buildings which do credit to these trades. St. Peter's, Eaton-square, St. Mark's, Kennington, St. Matthew's, Brixton, and many other churches of the "three-decker" and high pews and galleries sort were decorated with stone or stucco porticos.

But the austere and serious face which building put on at the beginning of the reign was not all genuine. Beneath, it was largely a falsehood: it concealed poor construction, imitated stone and marble, and did many things we are now ashamed of. It is said that we live no longer in history, but in fiction. This may be so to a large extent; but we do not hide the fact—we do not pretend to be serious and solid when all the time we are putting a false face on our buildings. The dull and solid building era of which we have spoken was contemporaneous with the period of heavy and serious reading which characterised the early part of the present century, while the romantic taste for Gothic came in with the newer literature of the novel. One writer has, indeed, observed that the interdict on Sir Walter Scott's novels was not removed till the "sixties," and this will be found to synchronise with the Gothic fever. The connection between the two is at least instructive; the solid and dull-looking houses of sixty years ago gave evidence of the honesty of workmanship which prevailed amongst the building trades—apprenticeship was still in force; contract cutting and speculation had scarcely come in, and bricklayers, carpenters, and joiners, and plasterers did their best on the old-fashioned system of measure and value. Not that construction as a science was well understood. A huge system of shams had grown up with the Revival, just as in history, it has been found that nine-tenths of what passed for it with our forefathers was nothing but fiction. Thus our men and women are beginning to revise their earlier notions of a great many institutions and events which they learned at school to believe as national blessings. Alfred Bartholomew, in his "Specifications for Practical Architecture," published in 1840, exposed many of the dishonesties of the buildings put up in his day. There was good and bad; but although masons, bricklayers, plasterers, and carpenters worked on wrong principles in their several trades, they did the work well. No one will defend parapets and entablatures which concealed all behind, false

ceilings and arches and a heap of plaster and stucco shams, but yet we must praise the accuracy of much of the workmanship, the solid masonry, the close-fitting window sash, the well-framed roofs and tongued and grooved skirtings. The austere tone and character of the architecture of this early period is reflected in many of the treatises and architectural books of the time. Read, for instance, the "Lectures on Architecture," written by James Elmes, architect, author of the "Treatise on Dilapidations," and dedicated to George IV., published in 1821. See in what method the styles are described. We pick out sentences at random. In Lecture V., discussing the principles of Roman architecture, Elmes says, "To architectural knowledge and taste as a fine art must constructive knowledge be added, or all we shall build will be worthless. Half-burnt bricks, half-rotten timber, stucco, and mastic will never make London an 'eternal city'; and till the constructive errors of modern builders, I had almost said architects, be eradicated, like the dry rot or the leprosy, the more we build after the prevailing fashion of the day, the more food we are providing for the contempt of posterity." Two things are to be noticed in this sentence—the idea that "architectural taste" was a fine art, something distinct from building; and the prophetic insight the author had of the building of his day, and the contempt of posterity for its errors. Again, in another passage we can learn how Gothic was understood and practised in his day by formalists. Elmes says "Batty Langley endeavoured to reduce it [Gothic] to a system, and to engraft on it the Five Orders of the Palladian school, instead of a more natural and philosophical arrangement; but this effort was altogether nugatory." Here we see the absurd attempt to reduce architecture to a set of rules—to set up a sort of Five Orders for every style. But the Batty-Langley attempt soon met with deserved ridicule. Even Elmes, who knew better, goes on to say: "The elements of this style seem to be derived in every instance from its type—the cone or pyramid; all we see in it is pyramidal." One of the pet theories of his day. A more reasonable hypothesis was that the pointed arch was formed by the intersection of two Roman or semicircular arches, as found in the abbey church of Malmesbury. These pretty ideas of origin have all been superseded by the only reasonable causes, the necessity of construction and vaulting. In a later lecture Elmes speaks of the new Custom House of London, as a "strong, useful building, not remarkable for its taste"; of Furnival's Inn as "contemptible as a work of art, possessing no one fine quality," the excellency of its workmanship rendering it more grievous that it should be designed with so little taste. The new street then forming from Pall Mall to Portland-place is spoken of as a great undertaking and of commanding character. Yet he says it has many blemishes, some of the "architectural specimens being in a taste absolutely barbarous." He speaks of it being free from "that dull monotony of elevation which is so wearisome in many of our new streets," and says it is the "finest work now in process," and has given a "relief from the eternal two-windows-iron-railing-and-a-door of the new squares and streets of St. Marylebone." Until this undertaking, Elmes says, our architecture seemed selfish and internal. Other works of the day are described and criticised, the bridges of Waterloo, Westminster, and Blackfriars, the two last being now rebuilt. He objects to the pseudo-architectural decorations of Waterloo, and says it is now "a fabric on which several acknowledged principles of good taste are utterly violated," and says also its mathematical principles are copied from the Pont de Neuilly. We can quote other authors to the same effect, Gwilt, W. H. Leeds, &c. A sort of spurious



Classicism affected the buildings and streets, and those who had the insight to discern and condemn this state of things appear to have indulged in a sort of self-complacent tone of morality that was itself far-fetched and immoderate.

If we turn for a moment to the practical duties of architecture, we find a great change. The architect and surveyor were almost synonymous terms when the Queen ascended the throne. Many of the leading architects of the time were surveyors. Wyattville, the restorer of Windsor Castle; Inwood, the architect of St. Pancras Church; John Nash, the designer of Brighton Pavilion, Regent's-street, and Regent's Park; Elmes, the before-named author of "Lectures on Architecture"; Blore, Smirke, Tite, Papworth, and many more were surveyors of some eminence, and some of them wrote books and tables. No doubt this union of the two offices laid the foundation for a practical knowledge of the profession, and in Gwilt and the treatises of Weale we see embodied much of this kind of information. Every leading practitioner knew how to measure his own work and to make detailed estimates. When the Gothic Revival came, the union of the two professions became less strong. A new style had to be learned, and with it methods of measuring up the trades. The contract system about the same time made the separation more complete, and building surveyors became a recognised branch. The result has not been without advantage to the profession. Architecture and the arts allied to it have been studied more thoroughly by a class of men who have devoted their whole time to them. The true meaning and spirit of design not understood in the fifties has been grasped, no doubt aided by the Government schools of design, and by the technical schools of the present day. But there is still something wanted. That something which we lost when historical architecture ceased in the 15th century, and when designing buildings became a profession distinct from building. We shall only find it again in trying to bridge over the gulf between the workman and the designer. Many causes have been at work in making the architect an independent factor in our architecture. The contractor has materially altered the pre-existing state of things by effectually separating the craftsman and designer. In our day, too, what is called "art" is being split up into a number of parts. Take the draughtsman: he is more of a distinct artist than he was sixty years ago. Many eminent men of the Revival period, like Soane, Cockerell, Barry, Pugin, and Scott, made draughtsmanship a branch of their profession, and prepared their own designs; but now it is almost a separate vocation, and many of the profession take to it as a livelihood distinct from actual work, and make drawings for others. Instead of a means to an end, there are those who have mistaken it as the end itself of art, and as having nothing to do with the practical. This is one of the mistakes into which we have fallen. Competition also has encouraged the draughtsmanship ideal of architecture. Then there is a tendency amongst us at the present day to divide art: machinery and labour-saving machines have made one man a sawyer, another a planer, a third a joiner. The art of decorator has been divided into a number of branches and operations: there is the designer, the modeller, the technical craftsman—one man does one thing, and another something else.

For every kind of decoration there is a specialist, designers, embossers, stencillers, painters, carvers, turners, so that in the production of one piece of decoration different men are engaged. A characteristic note of our day is the effort to get rid of this diversity, to bring all the branches into some sort of unity, to subject each to some kind of control. Mr. T. G. Jackson's recent paper, and the discussion on it, is an instance of this

effort on the part of leading men in the profession. To return to the Mediaeval lines and traditions may be impossible, and even a return to the system of the early part of this century would be undesirable; but we can do something to give up present-day conventions and mere academical rules. We must note the effort during the last years of this decade to introduce more of the practical side into the architect's work, to work side by side with the craftsmen. But there are difficulties. Some would have the young architect enter a technical school, and acquire a smattering of many handicrafts; others think that a thorough knowledge of one or two handicrafts—like masonry and carpentry—is better. The struggle between the academic and the technical spirit is a marked feature of the present. Theory and ideal art had absorbed the attention of the early Revivalists; but we have got beyond this, and now real architecture, real building, has to be faced. How are the men of the younger generation to acquit themselves of the task? This is the question awaiting the solution of our time.

#### ARCHITECTS ORDERING GOODS.

A CASE fraught with importance to the profession came before Judge Waddy, Q.C., of the Sheffield County Court, having been remitted from the High Court, and was reported in our last issue. The question before the Court was, Is an architect who orders goods for his principals liable? To understand the points, we must state the facts as reported. The plaintiffs were iron-founders near Sheffield, who brought an action to recover £54 18s., the price of stoves and tiled hearths which were sold by them to defendants, builders and contractors. The latter entered into a contract with the Chairman and the weekly board of the Sheffield Royal Hospital for the extension of the building. The architects gave plaintiff ironmongers orders to supply stoves. The counsel, in opening the case, said that when an architect ordered the goods to be sent to the work he was ordering as agent, and not as principal. The plaintiffs were told by the architect, in reply to their question whom they were to charge, that they must charge the goods to the contractors, and they, in fact, seemed to acknowledge their liability. The architect made out his certificate for £50 on account. The defendants did not pay, but said something about a contra account; but this had been settled. They took no notice of letters threatening proceedings. The architects, it was stated, gave the defendants credit in their account with the Board for the goods. On the other side it was contended for the defendant contractors that they were not directly liable. They argued, as the architect had given the order on behalf of his principals, that, therefore, he was liable. His Honour alluded to some previous litigation between the parties and a bad feeling. The facts further revealed showed that the architect had a provision in the contract which enabled him to order goods. The judge, in giving judgment, expressed his astonishment that contractors and builders should be so stupid as to give themselves up with their throats wide open to architects, and make contracts of such a kind. He sympathised with the contracting defendants, and after some other remarks of a similar kind, said he was of opinion that the contractor undertook to pay, and, therefore, gave judgment for the plaintiffs for the full amount.

The strong remarks made by the judge are perhaps what might have been expected, from the lawyer's point of view; but the architect had unquestionably powers to order the stoves and to charge them to the contractor. We do not know all the facts of

the case so far reported, but the view held by the Court would seem to prevent any control on the part of the architect over the goods or materials supplied to a building. It would stop the architect inserting provisional sums if he knew he would have no control in the selection of articles supplied. If the principals ordered the goods direct, they would, as the architect said in his evidence, often get a lot of rubbish which the architect could not pass. In short, the retention of the power to order articles for a building is absolutely necessary in the interest of the employer. If the architect has power to approve and condemn in the contract, he should also be able to go to certain firms and order articles like ironmongery and fittings that he may think desirable. An employer or a board may elect to make their own choice of goods; but in how many instances would they pass the requirements of the specification or the architect's taste? It is very customary for the architect to specify certain things, like special stoves, chimney-pieces, and decorations, which he knows can only be insured by his personal attention. To see that the amount is fully spent on the goods, it is necessary for him to give the order. To leave them to the contractor is to relegate a vital part of his design.

Indeed, the whole question of ordering goods in contracts is one of extreme importance to the profession, if they are to exercise the function of their art in a competent and intelligent manner. Legally, the architect is a "general agent," and, as such, has a power to act in various capacities. According to the dicta set up by the defence in this case, he cannot order goods for his employer without making himself liable—a theory which, if legally proved, would prevent a number of transactions from being carried out. Legal authorities have laid it down that a general agent, in the absence of any special agreement, has power to bind the employer by his acts and orders, and therefore the same rule holds in respect of an order given by him binding the contractor. For example, the architect can order additions and deviations; he can employ a quantity surveyor, and do other things; and therefore, if he makes these orders, he can surely exercise his authority in ordering goods and charging them to the contractor. Where special provisions are given for this purpose in the contract, we do not see how any question can arise. No doubt it is very necessary that the architect should, in addition to any implied authority as a general agent he may possess, make a distinct provision in his contract which will give him direct authority to order any material, fittings, or work which he may think necessary, and provide a sum for that purpose, and the mode in which payment was to be made, or deducted from the contractor's instalments, or whether the goods are to be delivered on the contractor's account. Building operations could not be carried on if architects were fettered, and had no power to order goods of the kind they wanted when occasion arose.

#### CONVALESCENT HOME AT EAST FINCHLEY.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

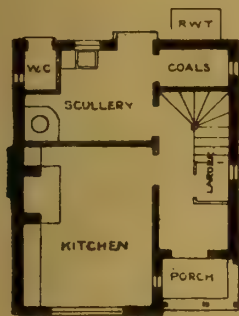
THIS home, which was opened by H.R.H. the Duchess of Albany on the 16th inst., has been erected for the National Hospital for the Paralysed and Epileptic (Albany Memorial), Queen-square, Bloomsbury, and takes the place of two small villas at East Finchley, which had been utilised for receiving women patients for many years.

The new home contains accommodation for 20 women, besides six female paying patients, and cots for children, and for six men, who occupy the wing on the east side of the entrance. The building stands on a pleasing site, sloping towards the south-west, with fine views towards Hampstead, and with convenient access from the Great



CONVALESCENT

HOME



GROUND PLAN

EAST FINCHLEY

THE LODGE



FIRST FLOOR PLAN



R. Langton Cole  
23 Finsbury Square  
E.C.

Northern Railway in the rear. The carriage entrance, with gardener's lodge, is from the Great North-road, near the corner of Bishop's-avenue. It will be seen from the plans that the male patients have a dormitory and day-room, with lavatories to themselves, their meals being taken in the large dining-hall on the other side of the entrance. This hall is the principal apartment in the building, and has a timber roof, carried by iron trusses, so designed as to avoid the usual unsightly tie rods. The windows, like those of the corridors, are filled with lightly-tinted leaded glass, and the fireplaces are of green moulded bricks, supplied, like the rest of those in the building, by the Teale Fireplace Company. Behind the dining-hall are the kitchens, pantries, &c., and next to it, opening from the main corridor, are two rooms for the matron and one for the visiting physician. Beyond this are the women's day-room (looking west and south, with pretty views from its large windows), and the three dormitories, while the bathroom, lavatories, and closets for the women are contained in a separate block opening out of the staircase.

It will be noticed that all the rooms used by the patients are on the ground floor, and that there are only three steps from the path outside, as it is undesirable for epileptic patients to go up or down stairs, and the doors are all made to open in two unequal widths so as to accommodate wheeled chairs. On the first floor are the rooms for the servants and nurses.

The soil and waste-water drains are all of cast iron, discharging through an intercepting man-hole (not shown on the plan) into the sewer in Bishop's-avenue. There is a separate system of stoneware rain-water drains discharging into a surface-water sewer in the same road, and a portion of the rain-water is collected in a large tank for use in the buildings. The exterior walling is in stock bricks, with red plinth arches and strings. The roofs are covered with red tiles. The woodwork is painted white. All the interior woodwork is stained dark oak and varnished. The corridors are paved with red tiles, and the rooms and floors are in tongued deal.

The garden and grounds of about 3½ acres have been tastefully laid out under the direction of Mr. B. Burford Rawlings, the secretary and director of the hospital.

The contractors for the home were Messrs. Godson and Sons, of Kilburn, and for the lodge Messrs. Wheeler and Peake, of Finchley. The architect is Mr. R. Langton Cole, A.R.I.B.A., and Mr. R. E. Walton was the clerk of works.

#### ADAPTABLE SPECIFICATIONS. XXXIX.\*

NOTES ON THE SUPERINTENDENCE OF WORKS.  
(Concluded.)

IT depends on the class of building to which it belongs whether the superintendence of the glazier's work is a very simple and easy matter, or whether it brings upon the architect more annoyances and vexations than almost anything else he has to do with. We say "upon the architect," for it is only on the man who deserves, or tries to deserve, that title that these vexations come. They do not trouble the surveyor-of-all-work; they do not disturb the serenity of the firms who do a roaring business in lining street after street with "the common architectural pot-boiler." If the glazing keeps out wind and rain that is enough for the pushing tradesmen of the profession—the men who ought to have been butchers or grocers, but who, through the obtuseness of the public, have become prosperous pretenders in an art which they neither understand nor care for.

To begin with quite plain, ordinary glazing, every pane requires to be solidly bedded on putty, or "back puttied." If this is imperfectly done, the glass may let in draughts, and will also be liable to crack. The wood should first of all be "primed," to prevent it from sucking away the oil from the putty, so causing it to shrink and curl up. The glass needs to be cut with exactness, small enough to allow a thin layer of putty to come everywhere between its edge and the woodwork, and yet not so small as to require too thick a layer, or to be in danger of becoming loose when this contracts. After being pressed tight against the back putty, and if the pane is a large and heavy one, after being further secured by small iron and copper brads, the front putty, sloped off or weathered to nothing towards the edge of the sash-bar, is applied to complete the setting. If the front puttying is carelessly done, some of it will be visible from the inside of the window, above the line of the wooden sash-bar. To prevent this, it should be kept a little shallower, where it touches the glass, than the depth of the rebate in which the pane is placed. After being left for a short time to solidify, the edge of the putty is trimmed off with a knife, and then both inside and out it is, or should be, painted like the sashes. Glazing in the panels of internal doors is often fixed with "shifting fillets"—in other words, the rebate is filled in, not by putty, but by a small wooden bead or

moulding, secured by brass screws. Where these panels are large, and the glass is in one piece, it may be bedded on cloth or washleather to keep it from fracture by sudden shocks. Sheet india-rubber has been used for the same purpose; but india-rubber—at least in the manufactured state—soon loses its elasticity by exposure to air and light.

The architect has to be on the watch, not only for careless glazing, but for that which is *thin and inferior*. A very little experience will enable anyone to recognise the different thicknesses of sheet-glass when the edges are visible. When the sashes are sent to the building ready glazed, this is not quite so easy; 21oz. sheet (21oz. to the foot super.) is ¼ in. thick. But the thickness is not absolutely uniform, so that towards one edge the sheet may be a little thinner than this, and towards another edge a little thicker. Some builders are so unlucky as always to meet with the thin parts of the sheets, or, at any rate, this is their standing excuse. It may pass once in a while; but when any noticeable proportion of the glass is found to weigh only 14oz. or 15oz. to the foot instead of 21oz., it is time for the architect to cultivate a healthy scepticism. The difference of thickness may be more or less judged of, even when the panes are puttied in, by the sound they make when rapped with the knuckles. Have a few of the most suspicious ones taken out, and see what their weight is. If they obviously belong to a thinner class than that specified, the rest should follow. *Patent plate* (which is only polished sheet) may, by another unlucky accident, find its way into a building under the name of *British plate*, which is better and more expensive. The latter has a true and even surface, the former a more wavy one. In both kinds it is generally possible to detect minute air-bubbles, and the shape of these will settle the question: in British plate they are spherical; in patent plate they are, from the mode of its manufacture, elongated or oval.

*Crown glass* has almost gone out of use. Ordinary crown weighs about 10oz. to the foot, and "extra" crown about 16oz. The sizes which can be obtained in it are small. Patent plate, weighing 13oz. to the foot super., is about ⅜ in. in thickness. That weighing 17oz. is ½ in. thick, and that which weighs 21oz. is ¾ in. thick. *Rough-cast plate* (used for risers to steps and similar purposes) may be had from ¼ in. to 1 in. in thickness. The largest size kept in stock of 21oz. or 32oz. sheet is 7ft. by 4ft. 15oz. sheet and fluted sheet are not usually made larger than 4ft. by 3ft., and patent plate not larger than 4ft. by 3ft.

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The glazing of skylights, in which the glass is simply lapped at the horizontal joints, is certainly capable of improvement. If the slope is at all flat, the lap should be considerable, and even then, as the two panes of glass seldom lie closely together, the rain is liable to blow up between them, and so enter the building. To prevent this, it is sometimes advised that they should be kept still further apart, a plan which may answer very well when there is an internal lantern beneath, but which otherwise leads to unpleasant draughts. For greenhouses and larger roofs, there are many patent systems of glazing which dispense with putty, which allow the glass to expand and contract freely, and which guard against "drip" from condensed vapour. This last is the gardener's horror, rotting and destroying his plants, and where, as in railway stations, there are large surfaces of glass, it may easily also become a nuisance to the public. The young architect will do well to note down the systems on which various large roofs are glazed, with the dates of their execution. While the work is new and sound, the name of the patentee is often conspicuously advertised on it. Possibly it may have disappeared a few years hence, should the glazing then begin to leak.

These points, and such as these, concern everybody who builds, be he surveyor-of-all-work, architectural tradesman, or genuine architect. But it is the architect alone who is interested in glazing as an art, a most inviting one, and often, through being in the hands of men to whom it is merely a business, a most disappointing one. The simplest piece of lead glazing might be a perennial pleasure if its tints were put together with as much taste and skill as some half-savage Turcoman lavishes on a five-shilling mat. But where is there the workman who will do it, and where is the master who will encourage him in doing it? Since monasticism soured into Puritanism, and Puritanism putrefied into mammonism, English people have lost, first the delight of healthy minds in colour, and then the power of distinguishing beautiful colour-groupings from hideous ones. The average Jubilee decorations of 1897 show what sort of colour the average Londoner prefers. What chance has the artistic architect with such a client as this to satisfy?

#### BRICKS FOR BRITISH ROADS.

WITH a view to collecting statistics and practical information on the subject of brick paving in this country, a series of questions referring to the use of "Brick Pavement for Carriageways and Footways" was sent out by the *British Clayworker* to town surveyors in the United Kingdom. From 156, replies were received to the effect that they had no experience in the use of brick pavements or that such pavements had never been employed in their towns. From 60, categorical replies were received, and this information is summarised below. In addition to the categorical replies, letters were also received from 22 surveyors. The following expressions of opinion have been received by our contemporary and are extremely interesting, as being derived in most cases from actual experience.

**Acton.**—Considers Staffordshire blue bricks make an excellent footway at a moderate cost.

**Bilston.**—Uses brick for footways with general satisfaction. Cost, 2s. 6d. per square yard.

**Bootle.**—Considers brick absolutely useless for heavy traffic. Some years ago tried a few hundred yards of patent brick-paving, with wood-plugs lin. by lin. inserted on the face. In six months the carriage-ways showed signs of wearing, and within two years the whole of it had to be relaid.

**Bournemouth.**—Feels sure that brick pavements for carriage-ways would be a failure even at Bournemouth.

**Burslem.**—Blue stable bricks were laid alongside granite sett pavement, which had been down for over 12 years and is still in good condition. Bricks worn out in twelve months.

**Cheltenham.**—Only crossings laid with brick; but very strongly approved by horse-owners, and is at the entrance to the largest horse-sale rooms in the West of England.

**Colwyn Bay.**—Considers Staffordshire blue brick durable, and looks well for footpaths.

**Coseley.**—Some footpaths paved with Staffordshire blue bricks with good results. "The bricks manufactured in this district would not, in my opinion, make a satisfactory carriageway pavement for heavy traffic owing to the following

reasons:—Brittleness, uneven texture, porosity, although I am inclined to believe, so far as my experience goes, with Staffordshire—Tipton—blue bricks that if laid on a foundation of Portland cement concrete and well grouted in with Portland cement, that a good carriageway pavement could be made (not for heavy traffic)."

**Derby.**—Does not consider blue bricks at all suitable for carriageway pavements.

**Doncaster.**—Thinks brick pavements inferior to flags for side-walks. Not at all suitable for carriageways.

**East Ham.**—Only laid in footways. Surface very good now after nearly 20 years.

**Hereford.**—Would not under any conditions recommend bricks for carriageways.

**Herne Bay.**—Do not wear evenly, and are not strong enough to stand heavy (especially hoof) traffic.

**Hull.**—"Although I was aware that brick was used on a large scale in America, I was not aware that 'unmistakable success' had been attained; but was under the impression that the general bad state of the roads made brick pavements appear good by comparison, while at the same time it prevented the carrying of excessive weights. No doubt the great width of the streets also tends to permit of materials being used which must be less durable than the best granite."

**Heston and Isleworth.**—Has laid many miles of blue-brick footpath paving in various towns during the past 20 years with satisfactory results.

**Leicester.**—Does not use or approve of brick pavements, either for carriageways or footways.

**Middlesbrough.**—Scoria blocks have been in use for 20 years. Far superior in every way to granite and whinstone and about half the cost.

**Mile End Old Town.**—Uses Tees scoria bricks made from iron furnace slag, which make an excellent clean paving.

**Ogmore and Garw.**—Believes that a grooved brick burnt hard would be an excellent material for footways and carriageways, as there would be very little dust arising therefrom, and if properly looked after, could be maintained at very little cost and easily repaired.

**Portsmouth.**—Does not approve of brick paving for footways.

**Ripon.**—Has abandoned them (scoria or slag bricks) for footpaths on account of their slipperiness.

**Rotherham.**—Does not like brick paving. Cost about 1s. 9d. per square yard for footways. Some laid in 1877 are getting worn out and will be replaced with flags.

**Rothwell.**—A quantity of Staffordshire blue brick foot pavement laid about ten years ago. Council contemplates removing it and substituting asphalt.

**Stone.**—Brick footpaths easy to repair after breaking up for drainage, &c. Work loose and have a dismal appearance.

**Sunderland.**—Considers brick pavements altogether unsuitable for carriageways; and not so durable, satisfactory, or economical as cement concrete, laid *in situ*, for footways.

**Sutton Coldfield.**—Is of opinion that for footways Staffordshire brick forms a durable, inexpensive, and satisfactory pavement when of good quality and properly laid.

**Southgate.**—Has not yet seen the bricks of this country which would be suitable for carriageways. Neither does he remember seeing any on the Continent, his experience being limited to Belgium, Denmark, and S. Sweden.

Candy's bricks are made from splendid clays, but they must be carefully selected and free from internal laminations and fire cracks. Paving goods have improved very much lately. When used for crossings to gateways they are a great improvement upon the setts, but are purchased with a deep groove. They require to be laid with the grooves in even lines.

Prefers the Adamantine to the Staffordshire blue bricks.

**Tewkesbury.**—Can lay cement paving at less cost and more easily. Some distance from brick-fields and the cost is heavy.

**Tunbridge Wells.**—Extremely economical and satisfactory for footpaths where the traffic is not excessive.

**West Ham.**—Brick footways laid more than 30 years ago are now in excellent condition under considerable wear.

**Whitehaven.**—Thoroughly well satisfied with brick paved footpaths.

**Wimbledon.**—Has tried bricks for carriage crossings, but they are cracked.

**Acton.**—Footways only. Blue chequered Staff. bricks, 9in. by 5in. Laid on a foundation of broken clinker, laid and jointed in lime mortar. Has been down over 15 years and is still in good order, requiring slight repairs at corners where traffic is concentrated.

**Ashby-de-la-Zouch.**—Footways only. Blue wire-cut Staff. bricks, 9in. by 4½ by 3in. Laid flat on a foundation of broken bricks and engine shashes, and jointed with sand. Has been down over 25 years, and is still in good order.

**Ashford.**—Footways and crossings. Candy's white, 4in. by 8in. by 2in. panel. Laid on a foundation of 8in. to lin. cement concrete and grouted with cement. The surface flakes off. Considerably cheaper than granite setts.

**Barmouth.**—Footways only. Blue vitrified bricks, 7in. by 4½in. by 3in. Laid flat on a foundation of stones or concrete, and grouted with cement. It has been down some time, and there has been no failure. Cheaper than granite setts, can be more easily repaired, though not so durable under traffic. There is less noise and dust, the absorption is greater, and the foothold for horses is not so good; traction is more comfortable.

**Beckenham.**—Footways only. Burgess Hill red paving brick, wire cut, 8½in. by 4½in. by 2in. Laid in parallel courses at right angles to kerb on a foundation of 4in. hardcore, 3in. Portland cement concrete. Jointed by laying on a collar of lime grout and sharp sand brushed into joints. It has an average life of 15 years.

**Bedford.**—Footways only. Staff. blue bricks, 10in. by 5in. by 2in. Laid in mortar on a bed of sand on a foundation of gravel.

**Birmingham.**—Footways only. Blue bricks, 10in. by 5in. by 2½in. Laid in mortar on a foundation of 6in. of ashes. Average life 15 years.

**Bournemou h.**—Cab and omnibus stands only. Blue Staff., 9in. by 4in. by 3in. Laid on ½in. of sand with a foundation of 6in. concrete and grouted in cement. Has been laid seven years, and is still in existence.

**Burslem.**—Blue stable bricks, 9in. by 4½in. by 3in. Laid on edge on a foundation of 6in. of concrete, and jointed with gravel and tar. Worn out under heavy traffic in a year. About one-third the cost of granite setts.

**Cheltenham.**—Crossings only. MacDougal's patent bricks, 9in. by 4½in. by 4½in. Laid on a foundation of 6in. of concrete or sand only, with close bitumen joints. Has been down for three years. In comparison with granite setts, the first cost is about the same; facility of repairs is greater; there is less noise, but about the same amount of dust and decay. The amount of absorption is a little greater, and the foothold for horses is better in every respect than granite, while traction is much less after a little wear.

**Chester.**—Footways only. Staffs. and Buckley, 12in. to 9in. by 4in. by 2in. and 12in. square. Laid in mortar on ordinary soil or sand bedding. Jointed in mortar and grouted in cement at times. Life is eight to twelve years.

**Crewe.**—Footways only. Staff. blue pavers, 9in. by 4½in. by 2½in. Laid herring-bone on a foundation of fine cinders 6in. thick, covered by a layer of sand 1in. thick, and jointed with sand. Have been down 20-25 years, and are still in working condition.

**Derby.**—Footways only. Staff. blue paving bricks, 9in. by 4½in. by 2in. Laid flat on a foundation of 5in. of ashes, ½in. of sand, and grouted in with dry sand. Cost of blue bricks, 2s. 9d.; granite setts, 7s. 6d. per yard.

**Dorchester.**—Footways only. Blue Staff. bricks, chequered on face, 10in. by 5in. by 2½in. Laid flat on ½in. of sand on a foundation of 4in. cement concrete. The joints butt close together, and the interstices are filled with sand. Some laid in 1893, and are now equal to new under considerable traffic.

**Dudley.**—Footways only. Staff. blue bricks, 12in. by 6in. by 2in., and 10in. by 5in. by 2in. Laid transversely, and bedded and jointed in mortar on a foundation of 6in. furnace ashes. They can be laid to a gradient of 1 in 10.

**East Ham.**—Footways only. Blue Staff., 10in. by 5in. by 2in. Laid in fine sand on a foundation of ashes upon clay, and grouted with Portland cement and sand 1 to 1. Laid nearly 20 years ago, and surface still very good. Under considerable traffic.

**Finchley.**—Footways only. Blue Staff., 10in. by 5in.; white Poole, 9in. by 4½in.; red Tunbridge, 9in. by 4½in. Laid on 3in. of P.C. concrete and grouted with cement. Red was laid



1889, blue 1891, white various. The reds will soon have to be renewed, owing to the surface flaking off and being affected by frost. Blues and whites are subjected to heavy traffic.

**Gloucester.**—Footways only. Staff. blue, 12in. by 6in. by 2in. Bedded in mortar and grouted in cement on a foundation of 4in. of brick rubble, 1in. gravel and sand, and jointed in mortar. Laid 20 years ago and still down. Traffic suburban.

**Hanley.**—Footways only. Best blue Staff, 9in. by 4½in. by 2½in. Laid herringbone on a foundation of engine ashes, and jointed with ashes and sand.

**Heston-Isleworth.**—Footways only. Blue Staff, 10in. by 5in. by 2½in. Laid on 2in. of concrete on a foundation of gravel and sand, and jointed with mortar. Traffic heavy, and results are satisfactory.

**Hereford.**—Footways only. Blue brindled and blue Staff. chequered, 9in. by 4½in. by 2in. Brindled laid on edge, and chequered flat, both on a foundation of concrete 6 to 1 and jointed in cement. Was laid from two to six years ago, and not yet worn out.

**Herne Bay.**—In comparison with granite setts the cost of bricks is less at first but cost of maintenance more. Brick pavements are more easily repaired though durability under traffic is less; it is less noisy and dusty, though the decay and absorption are more. They can be laid to 1 in 50.

**Keswick.**—Footways only, with light traffic. Staff. blue bricks, 10in. by 5in. by 2in. Bedded on dry sand on a foundation of 3in. sand and gravel, and grouted with cement. Been down ten years.

**Leves.**—Footways only. Red Sussex's, 9in. by 4½in. by 2in. Laid in courses right angles to kerb on mortar, on a foundation of ashes and jointed with sand. Traffic is light.

**Littlehampton.**—Footways only. Staff. and Buckley blue clinker bricks, 9in. by 4½in. by 2in. Laid square off the kerb and joint broken on a bed of lime mortar on a foundation of 4in. concrete and jointed in mortar and grouted with liquid cement.

**London.**—Footways only. Blue bricks 9in. by 4½in. by 2in. Laid flat on a foundation of engine-ashes, and jointed with ashes. They last from 10 to 20 years.

**Luton.**—Footways only. Blue Staff. chequered bricks, 12in. by 6in. by 2in. Laid at right angles to the building, half-bond on a bed of mortar, on a foundation of brick rubbish on engine-ashes 4in. thick, and jointed in cement mortar. Life, 18 years. Was taken up owing to black appearance and slippery nature. Cheaper than setts, though setts last much longer.

**Maidstone.**—Footways only. Blue Staff, 9in. by 4½in. Laid flat, and jointed with cement and sand grout. Wearing fairly well, with medium traffic.

**Mile-end.**—Carriageways and footways. Tees scoriae bricks, 8in. by 5in. by 3½in. Laid ½in. apart on a foundation of P.C. concrete, and jointed with lime grouting. Was laid in 1877, and is not yet taken up, with ordinary road traffic. Cost of maintenance and durability under traffic is not so good as granite setts.

**Newton-in-Makerfield.**—Footways only. Staff. blue chequered bricks, 11in. by 5½in. by 2in. Laid lengthways on a foundation of brick-bats and red sand, and jointed in mortar.

**Okchampton.**—Footways only. Candy's plain buff vitrified 9in. by 4½in. by 2in. Laid in thin mortar on a foundation of lime concrete 3in. thick, and grouted with cement. Laid in 1886 and still in wear.

**Oxford.**—Footways only. Blue Staff, 10in. by 5in. by 2in. Laid on a bed of Lias mortar with a foundation of gravel and gas ashes, and jointed with Lias mortar, with a life of about 20 years with foot traffic only.

**Portsmouth.**—Footways only. Vitrified blue bricks, 9in. by 4½in. by 2½in. Laid on mortar with a gravel foundation and jointed with mortar. Has been laid 25 years; repairs are constantly in hand, under rather heavy foot traffic.

**Ripon.**—Footpaths only. Scoriae or slag, 12in. by 6in. by 2½in. thick. Laid with lime mortar on a foundation of sand, and jointed with cement grout. Laid in 1882-3 and still down, with heavy traffic, though they wear slippery.

**Rotherham.**—Footways only. Staff. 10in. by 5in. by 2in. Laid square from kerb line and bedded in mortar with no joints. Laid in 1877, and still down.

**Rugeley.**—Carriageways and footways. Staff. blue paving bricks. For footways, 9in. by 4½in. by 1½in.

**Runcorn.**—Footways only. Buckley and Staff. 12in. by 6in. and 9in. by 4½in. Laid on a screened bed of sand and cinders, and jointed with sand. The traffic is heavy in some parts and light in others, and the average wear is poor.

**Seaford.**—Footways only. Staff. blue panel, 9in. by 4½in. by 2½in. Laid in cement on a foundation of cement concrete, and jointed with cement. Has been down 13 years, and likely to last several more under a large amount of traffic. They cost about half that of granite setts.

**Shelton-in-Chelwood.**—Crossings only. Scoriae pavers, 9in. by 4in. by 4in. Laid on a foundation of 4in. of broken slag, 2in. sea sand, and jointed with cement mortar. Heavy carting and farm traffic.

**Stone.**—Footways only. Blue Staff. dust bricks, 9in. by 4½in. by 2in. Laid in dry-screened engine ashes with any hard dry material for a foundation, and ashes brushed into joints.

**Stourbridge.**—Footways only. Blue 10in. by 5in. by 2in. Bedded in mortar on a foundation of ashes. Laid 20 years ago, and will last several years yet with considerable traffic.

**Southgate.**—Footways only. Candy's adamantine vitrified buff, 9in. by 4½in. by 2in. Laid in coarse cement mortar on a foundation of 6in. hard core rolled sand and spread over top or 6in. coarse concrete, and jointed with fine sand or grit. Laid two, three, and five years ago. Traffic not heavy, and cost at first about half that of granite setts.

**Tipton.**—Footways only. Staff. best blue, 10in. by 5in. by 2in., and 10in. by 5in. by 2½in. Laid in mortar on a foundation of ashes and grouted. Square jointed; heavy traffic. The first cost is less than granite, the maintenance more; facility of repairs easier, but it is not half so durable. About the same noise and dust, more decay, but same absorption; not such a good foothold, but easier for traction. Gradient 1 in 10.

**Tynemouth.**—Footways only. Bricks laid on a 6in. foundation of 1in. cement, 8in. of sand and gravel, and bedded on sand and jointed with pitch. Has been down six months, and is wearing well.

**Wedgebury.**—Blue, chequered, 10in. by 5in. by 2½in. Laid on mine dust 4in. thick, on a foundation well rammed, joints filled in with fine sand or grit. Life 25 to 30 years with considerable traffic.

**West Bromwich.**—Footways only. Best blue Staff, 10in. by 5in. by 2in. Laid in plain courses or herringbone, on a foundation of ashes and ballast, and jointed with fine engine ashes swept into joints. Laid 23 years ago, and still down. Very heavy traffic.

**West Hartlepool.**—Blue vitrified Staff, 10in. by 5in. by 2½in. Bedded in lime mortar on a foundation of 3in. sand and ashes, and jointed with sand. Has been down about 13 years, and is still good with heavy traffic.

**Whitchaven.**—Footways only. Blue Staff, 10in. by 5in. by 2in. Laid crosswise on sand and gravel, with thin bed of mortar and close joints jointed with lime mortar. Has been down 15 years. Heavy traffic. Gradient, 1 in 15.

**Wimbledon.**—Footways. Buckley, Candy, and blue Staff, 10in. by 5in. by 2in., and 9in. by 4½in. by 2in. Laid dry on a foundation of ashes, and grouted with sand and water. Laid in 1884, and still down with light traffic. Gradient for footways, 1 in 25.

**Withington.**—In comparison with granite, less noisy, about same price, costs more for maintenance, for facility of repairs about equal, though not so durable under traffic. It is more dusty, more rapid at decaying, more absorptive. Foothold for horses better. Gradient, 1 in 10.

**Worcester.**—Footways only. Blue pressed bricks, 10in. by 5in. by 2in. Laid and jointed in mortar, and grouted with cement on a fine gravel and furnace ash foundation. It is about three-quarters the cost of granite, and has neither failed nor been abandoned.

**Wrexham.**—Footways only. Chequered tiles, 10in. by 5in. by 2in. Laid and jointed in mortar 15 years ago. Considerable traffic.

**York.**—MacDougall's paving bricks, jointed with creosoted pegs driven in; has proved satisfactory.

#### TECHNOLOGICAL EXAMINATIONS.

THE technological exhibition lately held at the Imperial Institute, and of which we gave a brief description, was instructive as showing the kind of examinations which the City and Guilds of London Institute hold. As many of our readers know, the Institute registers

classes for instruction in technology and manual training, and to inspect and report on the work of such classes, if a local committee is formed to undertake the superintendence of the classes. There are two grades of these examinations, the ordinary and the "honours," and in each of these the candidates are arranged in two classes, a first and second class, and certificates (first and second class) are awarded to successful candidates in each grade. Those of our younger readers who are desirous of competing can obtain the regulations issued by the authority. As some of our readers ask for information as to the kind of examination given in building, we may here more particularly refer to two or three of the most important subjects. To take the subject of Brickwork, questions on the nature and properties of the various kinds of brick in general use, and the purposes to which each is adapted, are, of course, essential. A learner ought to find this knowledge easy by reference to elementary treatises, but they are not all reliable. Then the modes of preparing and tempering the clay, moulding and burning and testing will form a part of the ordinary grade, matters which can be learned from books, but an ocular examination of the manufacture will be found a great aid. Other points are the nature and properties of lime and cement, and their use and methods of testing; the relative advantages and disadvantages of pit, river, and sea-sand; proportions for making mortar and concrete—all of which subjects can be learned from books to a certain extent. The ordinary grade candidate is also expected to know something about footings, the proportions of the courses required for walls of different thicknesses, the best means of acquiring such knowledge being by good diagrams, such as those given in "Building Construction," by Mitchell, or in the "Notes on Building Construction" (Longmans), or by means of models, unless the student has access to buildings in progress. Damp-courses, air-bricks, the forming of dry areas, laying drain-pipes, bond in brickwork, also learned from carefully studying the subject in books, as those above named or practically on buildings; how to form bond at acute and obtuse angles; stone facing to brick walls, hollow walls, the construction of fireplaces, flues, coppers, arches, and roof tiling are the principal subjects, besides which, the student has to know something of the mechanical principles of brickwork resistance to crushing, weight per foot cube and rod, and mode of measuring brickwork.

In the honours' grade, the same subjects are taken, and the student will be required to know something of the management of work, the rules which should govern bond, wall construction, pillars, the operations of shoring, underpinning, house drainage, vault construction, bays, setting out work, terracotta construction, architectural knowledge of styles, &c. Candidates who pass in either grade may go in for the practical examination of the same subject. This will include such things as setting out work from drawings, obtaining templates and moulds of arches, cornices, and other kinds of brick details.

If we take the work required in carpentry we shall find the student is supposed to acquire a number of facts about the nature and properties of wood used in these trades, modes of seasoning and preservation of timber, its strength, converting timber so as to avoid waste and shrinkage, and obtain the greatest strength, the use of tools, mechanical drawing necessary, a knowledge of mouldings and intersections at different angles, bevel, newel, and geometrical stairs, and other kinds of geometrical drawing. The Honours grade on this subject will include more advanced knowledge of the preceding, besides the construction of centres for arches of different kinds, fixing and striking, scaffolding, staging, circular work, handrailing, and special fittings. On the whole, the student in this subject requires to be a proficient in geometry and elementary mathematics, a good geometrical draughtsman, besides having a special knowledge of timber, its conversion, the modes of trussing and framing, and various practical details. The number and variety of the subjects given in this branch seem to be very severe, and few candidates are able to pass in the theory. Certainly not one carpenter and joiner out of a hundred who has done good practical work could answer all the questions set down in the syllabus. It is hard to combine the advanced theoretical knowledge required here with the practical; indeed, we believe the candidates who do obtain the full technological certificate are few. The ordinary grade candidate will



be generally required to pass the Science and Art Department's examinations in the elementary stage, and for the Honours he is supposed to pass in some science subject like practical, plane, and solid geometry, applied mechanics, or geology. Are not the requirements rather too stiff? Do they turn out the most efficient and independent craftsman? are questions of import.

#### CARPENTERS' COMPANY'S EXAMINATIONS.

THE annual examinations for shop and outdoor foremen, &c., held by the Carpenters' Company took place at their hall and at the Technical Schools, Great Titchfield-street (for the practical work), on June 16 and 19. Among the examiners present were Sir Philip Magnus, Professor Banister Fletcher, F.R.I.B.A., Professor Roger Smith, F.R.I.B.A., Mr. John Slater, B.A., F.R.I.B.A. (Vice Chairman of the Board of Examiners of the R.I.B.A.), and Mr. Hampden W. Pratt, President of the Architectural Association.

The number of candidates who sat for the examination was the largest the Company has yet had. The names of the successful candidates, in order of merit, are:—

##### FIRST-CLASS CERTIFICATES.

- (1) J. C. Brown, J. Creadson, H. C. Williams, *seq.* silver medals.  
(2) Wm. Humphreys, J. E. Pearce, *seq.* bronze medals.  
(3) G. A. Chambers, (4) Geo. Evers, (5) S. M. Horne, (6) Arthur Thomas, (7) Fredk. Bull, (8) Geo. Ayres, (9) H. H. Davey, (10) F. Hartnoll.

##### SECOND-CLASS CERTIFICATES.

- (11) A. Balfour, (12) T. E. Kinch, (13) W. S. Blair, (14) Wm. Gritton, (15) A. C. H. Pendlebury, (16) Chas. Rowe, (17) H. C. Blackman, (18) H. T. Snowdon, (19) Jas. White, (20) A. E. Martin, (21) F. A. Hansard.

Some candidates, already holding certificates, entered hoping to better their positions; as they have failed to do so, they are not included in this list.

#### WROUGHT-IRON AND STEEL IN CONSTRUCTIONAL WORK.—XXI.

BEFORE giving drawings of some of the principal types of beams and girders used, the sections of which were illustrated in the last article, it will be as well to indicate by means of skeleton diagrams the elementary principles on which they are constructed, in respect to their longitudinal arrangements. When the solid-webbed, or plated, girder is abandoned in favour of the open-webbed form, the lattice work or bracing offers several possible arrangements by which desired results may be obtained. Always, however, it is a triangular arrangement of bars which is adopted, and that for obvious reasons. The triangle is the only polygonal figure which is unyielding when articulated. And the best theoretical form for an elementary truss is the triangle in which two struts meet at an angle of  $45^\circ$  with the horizontal, the lower ends resting upon abutments and connected with a tie-bar. A combination of such triangles, the stresses in which are transmitted to abutments, comprises a lattice girder, Fig. 109. The reason why triangulation is adopted is that the triangle cannot be altered in form except by fracture of its parts and connections; while a rectangle can be pushed into the form of a rhombus. In the first case, therefore, we have the exemplification of the triangle of forces, always in equilibrium; in the second there is no such equilibrium. But a rectangle having its corners connected with a diagonal is altered into two triangles. The bases of a system of triangles comprise the top and bottom flanges of a girder. And the lattice-work is simply the means by which the stresses due to the load and the weight of the truss are transmitted to the abutments. These comprise the web members of a truss, in contradistinction to the flange members, and they take the place of the web in joists and plate-girders. These members, in transmitting the load imposed upon the truss to the abutments, change the transverse strain due to the load into other stresses of tension and compression along the web-members and the flanges. One portion of the load travels up and down the struts and ties towards one abutment, the other portion towards the other abutment. Each vertical member, whether strut or tie, is strained by the portion of the load transmitted through it by an amount equal to the load, but oblique members are strained in a greater degree in proportion to



FIG. 109.

their obliquity. The amount of strain is the same in any one member, whether it act as strut or tie. But the nature and degree of the localised strains depends on the manner of loading, which may be on the top flange or on the bottom one; central, or out of centre; distributed or concentrated. The stresses in the flanges always increase from the abutments to the centre, and the stresses in the web members from the centre towards the abutments.

hold good absolutely, because the bars would sometimes be reduced to dimensions so small that the girder would become, in extreme cases, similar to a thin plate girder, liable to become twisted and crippled. In any case, they require the aid of stout vertical stiffeners. The ends, too, require stiffening where the short bars terminate. On the other hand, the crossing and riveting of the bars shortens their effective length, so increasing their rigidity, and also angles of, and



FIG. 110.

The angle which the oblique-web members make is variable, being dependent to some extent on the height of the truss, which again increases with the span. The most economical arrangement of material is that in which the least angle which an oblique member makes with the flange or boom, is  $45^\circ$ . But in a deep truss this involves placing the verticals so far apart that the spans between are too great for the safe carrying of rolling loads. In the Warren girder,

near,  $45^\circ$  can be adopted for the bracing, which is not usually practicable when a single system of triangulation is adopted. As a general rule, therefore, practice favours the use of single or double latticing in preference to multiple systems. A multiple system will afford excessive strength in some localities with unnecessary increase of weight. But the same end may be reached by a lesser increase in the weight of a single system.

Fig. 112 illustrates a Warren girder in which



FIG. 111.

therefore, verticals sometimes are introduced midway between a triangulation.

In the Warren truss the triangles are made equilateral when practicable, as in Fig. 109. The bars comprising them are then equal in length to the width of a bay, their angles  $60^\circ$ , making the depth of girder equal to  $\cdot 866$ , or nearly  $\frac{1}{2}$  of the width of a bay, which is the proportion that the perpendicular height of an equilateral triangle bears to its base.

the triangulation is not equilateral, and which would often in deep girders be preferable to the arrangement in Fig. 111. Figs. 113, 114 illustrate bracing in which the triangulation is not equilateral, but which consists of verticals and diagonals. Thick lines are in compression, or struts, and the thin ones in tension, or ties. Such girders would not be in stable equilibrium under severe rolling loads, as they would be under dead loads. The reason is that the triangulations are

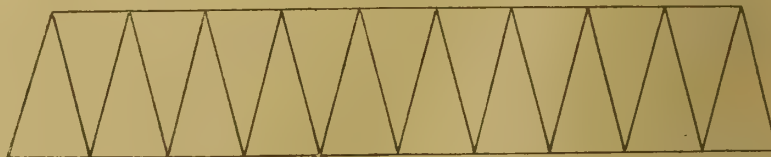


FIG. 112.

The double and the multiple lattices are formed by the superposition of two or more simple lattices, Figs. 110, 111. The advantage is that the load is distributed over a correspondingly greater number of points, reducing the deflecting strain on the flanges. Also, that the added lattices reinforce the simple triangulation, so that the resisting power of the latter is increased. The strains are calculated first for a simple or single

insufficiently braced. Hence, counterbracing is adopted in most cases for moving loads in which the triangulation is not equilateral.

Counterbracing is essential in moving loads, although its functions are only called into play at certain times. It is necessary in such trusses as Figs. 113 and 114, but not in Warren girders. The insertion of counterbracing, indicated by the dotted diagonals in Fig. 113, forms a series of



FIG. 113.

system, and then divided equally among the total number of systems. It follows that the total strength of a multiple system of bracing should be theoretically the same as that of a single system, and consequently the scantlings of the bars may be proportionally reduced. But this does not

triangulations which effectually resist distortion. In another sense, counterbracing means the designing and fixing of single diagonal members in such a manner that they shall be able to sustain alternate stresses of tension and compression, produced by unequal loading, without yielding





Fig. 114.

under either stress. For example, in Figs. 113, 114, if the compressive members do not yield if put into tension, or the tension members if put into compression, then it is clearly impossible for the rectangular form of any panel to be altered by any stress short of that which would produce crippling or rupture, and the dotted diagonals in Fig. 113 would be superfluous. But other considerations have weight, such as the advantage of crossing and riveting the members

also the minimum, stresses on each member, because the range of stress, as well as the intensity of a stress, determines the working load. It is due to the researches of Wohler and Spangenberg into the fatigue of materials that a greater degree of refinement and precision has been brought to bear upon the design of the various details of structures subject to moving loads. Repeated applications of a load which is much less than the absolute breaking load produce ultimate fracture.



Fig. 115.

at the centre, and the undesirability of making long members fulfil the functions of struts and ties. Fig. 115 shows a common form in which the struts and ties are arranged on a simple system, except at the centre, where they are cross-braced. The advantages of crossing the verticals and diagonals are also secured.

The remaining figures illustrate a few other common forms of bracing. In Fig. 116 the top

The difference between the maximum and minimum stresses in a load repeatedly applied is termed the "range of stress." The range may be that of the difference between maximum or minimum tension, or of maximum and minimum compression, or the sum of the maximum tension and maximum compression in a piece subjected to alternate stresses of both kinds. These differences are very considerable, and they are



Fig. 116.

and bottom flanges are connected with crossing diagonals only, at angles of  $45^\circ$ , forming superimposed triangles. In Fig. 117, verticals are introduced. Girders in which vertical rods are used in addition to cross-bracing are employed for bridges loaded on the lower side, the functions of the verticals being to stay or stiffen the vertical portion, and maintain it perpendicularly. The verticals may be increased in number as in Fig. 118, dividing the panels into half-panels,

embodied in formulae dealing with portions of structures to which the above conditions apply.

Dimensions exactly proportionate to calculated stresses are not always adhered to. The stresses in lattice bracing change in every bay. But each single bar is not made different from the rest, but bars of a certain size are arranged in small groups. In the top and bottom booms or flanges, the plating must break off abruptly, instead of following a perfect parabolic curve. This is



Fig. 117.

and the diagonals will run across and be riveted in the middle of a vertical. These are only skeleton outlines of girders with straight flanges. But similar elements are employed in girders in which one or both flanges are curved, examples of which will be given.

It is not a maximum load covering the whole of a bridge girder that strains the members most. It strains the booms or flanges, and the end

minimised by using thin plates. There are uncertainties respecting the intensity of the effect of moving loads on particular members, uncertainties respecting workmanship, riveting, &c., and experience becomes the only sufficient guide in imparting good proportions without unduly adding to dead weight.

The upper and lower flanges of lattice girders are termed booms; in America "chords." The



Fig. 118.

verticals, and obliques most; but the separate bays or panels are strained more by a portion of the load moving over them. That is the reason why it is more difficult to estimate the effect of moving loads than of quiescent ones. The stresses vary greatly in the same member, and it becomes necessary to calculate not only the maximum, but

vertical connecting members are struts or posts when in compression, and ties or suspension-rods when in tension. The diagonal bracing bars are struts, diagonal struts, or strut braces when in compression, and ties or tension braces when in tension. Bracing is main bracing or counter bracing. A panel is the portion of a truss which

lies between two adjacent verticals. The portion of a Warren or triangular truss included by the three sides of the triangle is called a bay.

J. H.

#### PURIFICATION OF WATER BY METALLIC IRON.

**T**HIS process was suggested about ten years ago by Sir Frederick Abel, and was first practically applied at Antwerp, where foul water, drawn from a source a little better than a sewer, has been converted into a drinking water—bright, clear, and wholesome; and this explains why Antwerp has been so free from epidemics of cholera and other diseases since these works have been in operation. This method of purifying water can no longer be considered as in the experimental stage; it has been installed in some of the important cities of Holland, France, Turkey, and India, and has been recommended for improving the water supply of Florence, Italy, by Sir Douglas Galton, the eminent English engineer and sanitarian. While it cannot be said that the process gives a perfect water, it certainly gives one which is wholesome, as has been shown in many Continental towns.

When the process was first introduced at Antwerp, its original birthplace, by Dr. Anderson, who designed the mechanical appliances for agitating the water with scraps of iron, it was considered that the iron had a more or less pronounced chemical action upon the dissolved organic impurities of the water, but it now seems that the real action is one of coagulation, the formation of a precipitate in the water tending to throw out of solution the dissolved organic substances, and this view of the process applies equally well to its action upon microbes, which become entangled in the gelatinous precipitate, and either subside with it to the bottom of the settling tank, or remain behind on the surface of the sand filter through which the water is passed.

After being agitated with the metallic iron, Dr. Dupré examined water where there was only sand filtration and found the microbes were from 1,300 to 3,000 per cubic centimetre, but directly the iron process was applied, the number sank to 100; they very rarely exceeded that, and sometimes went down as low as 5. The effect of filtration of water by this process is not so much to remove chemical substances as to remove microbes. It is true that water may be foul and objectionable irrespective of microbes, but the main advantage of the iron process is that it removes the microbes so completely. Dr. Dupré says:—"This can only be done by very perfect sand filtration at the rate of 4 in. per hour; but if the rate is varied by  $\frac{1}{2}$  in. per hour, or an inch, the whole process breaks down, and you jump at once into hundreds of microbes. With the iron process, you may vary the rate from 4 in. to 20 in. without apparently affecting the numbers at all. The film of iron which is formed is such a perfect medium that even continued disturbances in the rate does not seem to affect the result."

The apparatus for purifying the water is a hollow cylinder, either of cast-iron or built up of plates like a boiler, supported horizontally upon hollow trunnions, through one of which the water to be purified enters; after traversing the cylinder, it leaves by the other trunnion. The cylinder is caused to rotate about its axis by means of a gearing, which is driven in any convenient way. Fixed inside the shell of the cylinder, and running longitudinally, are six shelves, five of which are curved in the direction of the motion of the cylinder. The sixth shelf is not curved, but is formed of a number of square flat plates arranged *en echelon* to insure a more continuous and regular action of the apparatus.

The cylinder is charged with a certain quantity of metallic iron, according to size—a purifier capable of treating 1,000,000 gallons of water in twenty-four hours requiring a charge of two tons or more. The iron may be in any convenient form, but that most commonly employed in practice is burrs or punchings from plates. Cast-iron borings are very efficient, and, weight for weight, much cheaper. The charge of iron, in whatever form, is spread evenly along the bottom of the cylinder before commencing the work.

The water, on first entering the cylinder, strikes against a circular baffle plate, which directs the stream towards the shell and prevents it passing through axially. As the cylinder rotates, the curved shelves scoop up the charge of iron and shower it down through the water as they reach the top, thus causing a constant



falling of the iron across the current of the water. Practically, it is a process by which the iron is filtered through the water. The outlet pipe terminates inside the cylinder in an inverted bell or hood, coming as low down as the shelves will permit. The object of this contrivance is to prevent any iron from being carried out of the cylinder by the current. The revolving purifiers are made in fourteen sizes, distinguished by the diameter of their inlet pipes, from 1in. to 14in. In large installations, batteries of purifiers are employed, placed side by side, very frequently all discharging into a common outlet tank.

Mr. Anderson, who has presented a considerable mass of evidence showing the value of the process for the purification of water supplies, states that the effect of the agitation with iron upon the water is simply to cause a small quantity of iron—from one-tenth to one-fifth of a grain per gallon—to be dissolved, or, rather, held in solution, in the form of ferrous hydrate, which quickly changes under the influence of the air to ferric hydrate, which is precipitated in particles more or less coarse, according to the nature of the water to be treated. At Antwerp and other places, where the earliest applications of the process were made, a tank or reservoir existed before the purifiers were applied, and was consequently utilised. In more recent plants, where the works have been designed especially for the process, the expensive settling-tank has been replaced by a trough or flume, along which the water runs on its way to the filters.

From the settling arrangement, the water passes on to the filters, which are sand-beds of ordinary construction, and call for no particular remark, except that the sand be neither especially fine nor of great depth. Through the filters, the water passes at the rate of 80 to 100 gallons per square foot per 24 hours, and emerges pure and free from any trace of iron.

A very important feature of the iron process consists in the rapidity with which perfect results are secured. A few years ago the Massachusetts State Board of Health, after an elaborate series of experiments, showed that an ordinary sand-filter would not remove any considerable number of microbes in water until its surface had become sufficiently blocked by a layer of matter (or filth-destroying bacteria), separated from the water being filtered. To obtain this result it was necessary to work the filters for several days, delivering all the while imperfectly-filtered water, until this layer had time to form. With the iron process no such thing occurs. The filter yields, from the first, water containing the minimum number of germs. We know that any accidental disturbance of the surface of the sand of an ordinary filter seriously impairs its micro-biological efficiency, but by the iron process the filters are wonderfully tolerant of such disturbances. After working one of these filters a fortnight, the film was purposely broken up by dragging a chain over the surface of the sand. One hour after this operation, a sample of the water was taken and found to yield only 40 microbes per cubic centimetre, and subsequently, hourly samples yielded from 31 to 67 microbes per cubic centimetre. The original water, before filtration, contained from 20,000 to 100,000 microbes per cubic centimetre.

The following is a history of the reception of the iron process in France:—About five years ago the process attracted the attention of the largest and most influential water-company in France—the Compagnie Générale des Eaux, of Paris. After having investigated the process at the places where it had already been adopted, the Compagnie des Eaux wished to have further proofs, and the Revolving Purifier Company, which was formed in 1880 to work the process, undertook to demonstrate its efficiency in dealing with the water of the Seine, taken below Paris, at the pumping-station of the waterworks of Boulogne-sur-Seine, close to the Pont de Sèvres, not far from the outfall of the sewers. Accordingly, a complete plant was erected, capable of dealing with 100,000 gallons of water in twenty-four hours, consisting of a 6in. purifier, delivering into a long settling-trough and filters to correspond. This plant ran for some months, and amply proved the correctness of all that had been claimed for the process to the complete satisfaction of the Compagnie des Eaux, who closely followed the trials, and made all requisite analyses. The next step was the application of the process to the whole of the water pumped from these works. The trial plant was removed, and two 10in. purifiers erected, capable of treating rather more than 1,000,000

gallons daily. The results have been most gratifying. The Seine water at the point of intake, though not very heavily loaded with organic matters, is very rich in microbes, the average result of some analyses indicating the presence of nearly 400,000 per cubic centimetre. Dr. Miquel, the eminent head of the bacteriological department of the Observatoire de Montsouris, was commissioned to investigate the working of the process here, and during the period from February to July, 1893, took twenty-two sets of samples for analysis. The purified water was, on each occasion, compared with the spring water of the Vanne, which is considered to be the model of what a drinking water should be. The result of his analysis is surprising. Of the 22 samples of purified water examined, no less than 11 were either equal or superior to the water of the Vanne on the same date, as regards bacterial purity, while the average of the whole set of samples of purified water gave a figure which does not greatly exceed the average of the Vanne water. The average number of microbes removed was 99.57 per cent. of those existing in the original water. The Boulogne works being the first really designed throughout to work the Anderson process, it was of great interest to see how the working expenses came out. It is satisfactory to find that the cost of purification is very low. The following detailed figures give the working expenses for one year:—

Description.	Working Expenses.	
	Francs.	Dol.
Iron (at 7 francs per 100 kilograms).....	350	67.55
Cleaning decanting reservoirs.....	180	34.74
Cleaning filters.....	780	150.54
New sand.....	300	57.90
Coal, oil, waste, &c.....	1,400	270.20
Total.....	3,010	580.93

Installations have also been made at Libourne, Nice, Monaco, Mentone, and Villefranche-sur-Mer. The total output of the Nice works ranges from 6,000 to 8,000 cubic metres a day, or from 1,300,000 gallons to 1,700,000 gallons. The installation works well, and the purity of the water is all that can be desired.

Early in 1894 a contract was signed between the prefect of the Seine, acting on behalf of the department, and the Compagnie Générale des Eaux. The Compagnie des Eaux in this contract undertook to construct works on the Seine and the Marne, above Paris, capable together of purifying 70,000 cubic metres daily, or nearly 15,000,000 gallons, and to remove 99.6 per cent. of the microbes in the original water. These works were to be in full operation by January 1, 1896. The total cost was estimated to be 12,000,000 francs (2,310,000dol.).

C. W. CHANCELLOR, U.S. Consul at Havre.

#### THE ARCHITECTURAL ASSOCIATION OF IRELAND.

THE annual excursion took place on Saturday, 12th inst. The party, numbering about 25, assembled at Amiens-street in time for the 9 a.m. train to Drogheda. On the arrival of the train at Drogheda, brakes were in readiness to convey the party to Mellifont; the drive thither was through an exceedingly pleasant country, the route taken being along the valley of the Boyne, passing by the scene of the historic fight where the last of the Stuart kings made his final effort to retain the crown. An obelisk to commemorate the victory of King William marks the spot. Close to this the road crosses the river into the County Louth by an iron lattice-work bridge. A little further on, the way was through the beautiful demesne of Mr. R. H. Balfour, D.L., Townley Hall. The house itself is a large but uninteresting structure of the Grecian style in vogue during the early part of the present century.

On arrival at Mellifont Abbey, the party distributed through the remains of this fine old Cistercian abbey; of the church itself little remains but what suffices to mark the lines of the plan, which is of the usual Cistercian type; but the octagonal baptistery is a building unique in its character in this country; portions of it are in good preservation, the mouldings of its richly-proportioned arcade of round arches being frequently wonderfully sharp. The detail is of a Transitional type. The chapter-house is in much better condition, and, strange to say, still boasts its vaulted ceiling—not a common thing in Ireland. The detail here is of Early Decorated character, and is very good. A small handbook has recently been issued containing some illustrations by Mr. Scott, of Drogheda (a member of

the Association), which gives an excellent account of this fine old place. A striking thing is that beyond the plan of the church there is little or nothing left of that type of architecture generally associated in one's mind with a Cistercian foundation.

At Mellifont, luncheon was served, which, having been done justice to, the party resumed work for an hour or so, some measuring, some sketching in pencil, and others manipulating water colours.

At about three o'clock the party drove on to Monasterboice, where the two very fine examples of Celtic crosses were examined with much interest; there are also a few small and quaint tombstones of the last century here. Some of the party ventured on the long climb to the top of the round tower, from which there is a fine view. Several photographic groups having been taken by Mr. Hudman and Mr. Coleman both here and at Mellifont, the party started back for Drogheda, which was reached sufficiently early to give time for a stroll round the historic old town. Amongst the places viewed were the old City Wall, and St. Lawrence Gate, the Constabulary Barracks (an old and rather quaint Georgian building), the new R.C. Church of St. Peter, the old abbey, &c.

The members dined together at the White Horse Hotel. After dinner the time available before the starting of the train was enlivened by some musical items by the president, Mr. O'Sullivan, Mr. Coleman, &c. The return journey to Dublin was made on the 8.8 p.m. train, arriving in Dublin at 9.30, when the party dispersed.

Amongst those present were the president, Mr. R. Caulfield Orpen; Messrs. J. Howard Pentland, R.H.A.; Joseph Holloway, George Sheridan, F. Hayes, T. F. Slevin, H. Alberry; A. J. M'Gloughlin, T. Coleman, P. F. O'Sullivan, L. Sharp, Anthony Scott, Drogheda; A. Scott, Jun., T. Hudman, and R. M. Butler, hon. secretary.

#### CONSTRUCTION OF ARCHES IN CONCRETE.—VII.

AS the construction of the arch of Monier cement with respect to dimensions and proportions was in every respect similar to that built of ordinary cement concrete, it will not be necessary to reproduce the half-elevation represented in Fig. 1 in our last article. Briefly, in both instances, the abutments of brickwork were 6ft. 6in. in thickness, with massive counterforts 3ft. 3in. thick, built of concrete. Between the spandrel walls a single line of track was laid with the English standard gauge of 4ft. 8½in. between the inner edges of rails. The rails were spiked down to cross sleepers, spaced at a little over a yard apart, one being placed exactly at the crown of the arch. Over the whole span the dead load of the arch. Over the whole span the dead load of rails and sleepers, including the substratum of ballast upon which the latter rested and were partially imbedded, weighed 0.154 of a ton per square foot. In Fig. 3 a cross-section of the arch shows the whole arrangement. Before proceeding to pile up the testing load of iron rails, as in the experiments conducted with the rival arch already recorded, a preliminary trial was instituted, which in character approached a great deal nearer to the conditions obtaining in actual practice than those due solely to the action of simple dead weights. This trial consisted in running a six-wheel coupled locomotive, with its tender following, at a comparatively slow pace over the arch. The total weights, in tons and decimals of tons, were composed of the several items scheduled in the accompanying Table III., in which the several loads were assumed, as is perfectly correct both in theory and practice, to be concentrated over each pair of coupled wheels of the engine, and over the double pair of wheels carrying the tender.

TABLE III.

	Wheels.	Load upon each pair.
Engine .....	Leading .....	10.21
	Driving .....	13.14
	Trailing .....	12.93
Tender .....	Leading .....	9.23
	Trailing .....	9.37
Total .....		54.93

While this cannot be considered a very heavy load for an engine and tender, when compared with our own locomotive leviathans, and to go further, with the mammoth engines used to haul the express trains of the principal American lines. In the United States, the Consolidated, the



Scheigh, and the Decapod engines can muster among their heaviest rolling stock, engines and tenders, when fully loaded, weighing from 98 to 120 tons. As the engine and tender traversed the experimental arch, the maximum deflections, which were registered both at the crown and at

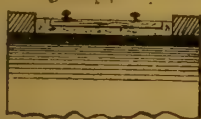


FIG. 3.

the quarter points of the span, did not exceed 0.08 in., and the permanent deformation or "set," as it is usually termed in all cases of a similar description, was just one half of the foregoing. Small as the live load appears, viewed beside that of the steam giants referred to, it was rather a severe test for what was, after all, but a temporary erection.

It has been already stated that the deformations during the testing were observed and recorded at certain predetermined points along the contour of the arch. These points are shown in the plan in Fig. 4, and are disposed into three parallel rows along the facial and central axes of the entire arch. There are thirteen in all, and five in each row, symmetrically arranged at each springing, quarter span, and at the centre or crown, and are numbered respectively from 1 to 13. It is evident, therefore, that care was taken in both experiments to ascertain the deflections at as many points as could be conveniently made subservient to the purpose. It is only in this manner that an accurate representation of the actually deformed, and in some instances crushed, condition of the arches after final rupture could be ascertained. These measures insured answers to the several questions which the experimentalists had to consider, among the principal of which were: Where, when, under what amount of aggregate loading, and in what manner did the specimens operated upon give way?

In Fig. 4 the first ten of the points selected for actual testing were situated over the spandrel

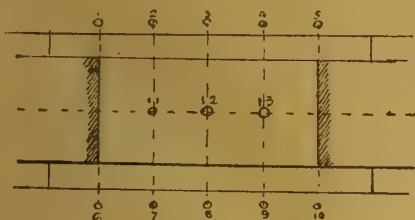


FIG. 4.

walls and haunching, which rest for their entire thickness almost upon the faces of the arch, while the remaining and last three were located exactly over the central axis of the whole structure. After replacing the six coupled-wheel engine by a heavier eight-coupled locomotive, and finding that both the deflections, temporary and permanent, were of an amount equivalent to a *quantité négligeable*, the trial was further conducted, as in the former example, with a dead load of rails piled upon one half of the arch. When a total surcharge of 91 tons had been reached, equivalent to 0.412 of a ton per square foot, a crack showed itself at one of the springings. Fissures also appeared in the spandrel walls and haunching, when the test load was increased to 100 tons, or about 0.420 tons per unit of area. This weight was allowed to remain undisturbed for several hours, when it was completely removed. After a brief delay, it was replaced upon the same half of the arch, and another trial took place. In this instance, the loading was gradually augmented until the total stood at 180 tons, equal to 0.756 of a ton on the square foot. This was the maximum surcharge imposed, for at this juncture the right abutment showed unmistakable signs of settlement, which speedily brought about the failure of the entire structure, the central part of the arch gradually sinking until it rested upon the centring, left to provide for such a contingency. Upon the centres being lowered, the arch sank further, but no additional cracks or fissures in the arch itself became in evidence beyond those at the springings

already recorded. At the same time, the spandrel walls, as might be expected after the yielding of its support, became completely disintegrated. An extra 12 tons were then added to the load, equal to a rate per square foot of 0.894 of a ton, which had the effect of increasing the number of cracks, producing a settlement in the abutments of 1½ in., and a further lowering of the central portions of the arch until it again rested upon the centring. At about a couple of feet from the crown, on the side of the unloaded half of the arch, a crack developed itself, extending the whole width of the work, which may be considered at this stage to have reached its maximum powers of resistance, and to be literally *hors de combat*. In Fig. 5, the thick full lines represent the arch in its normal or untested condition; while the dotted lines exhibit its distorted and deformed contours after the trial. It is rather unfortunate for the sake of comparison that one of the abutments of the Monier arch should have given way, as it evidently did, before the ultimate strength of the arch was reached. When partially rebuilt, it served its purpose admirably for the experiment made upon the rival structure. As far as a comparison can be made it stands as follows:—The arch, built of well-rammed ordinary cement concrete, evinced no signs of distress, nor exhibited any deformations worth registering, with a total load of 10.32 tons upon it. The arch constructed of Monier cement came down with a maximum surcharge of 9.83 tons. These are the facts of the case, and it would be to no useful nor profitable purpose to enter into speculations or hazard conjectures respecting what might have otherwise happened in the nature of a different result had the abutment in the experiment remained firm and stable. There is not, in fact, any particular difference between their respective powers of ultimate resistance. It does not exceed half a ton, so that even under the unfavourable conditions prevailing, one structure may be regarded as equally strong as the other.

It should be stated that the measured deformations and deflections were sometimes single, and at other times the mean of two. A reference to the diagram in Fig. 4 will explain this method with respect to the points where the measurements took place. At all the points, 11, 12, 13, situated along the axis of the arch, there was evidently but one deflection at each point, so that only one measurement could be taken for each point. But when we come to take into consideration the other points, 1, 2, 3, . . . 10, placed over the faces of the arch, the case is different, because these points are in pairs. Take, for instance, the points 3 and 8, which form a pair. It would be a waste of time to register each of the deflections separately at both of these points, which vary so slightly from one another. Both must be observed; but it is quite sufficient in tabulating them to give the mean of the two, and thus keep the "Table" within moderate limits. If, therefore, A and B be the two measurements recorded at any pair of points, and T represent the tabulated deformation, then

$$T = \frac{A + B}{2}$$

The deformations were measured and registered for both vertical and horizontal displacements, and are recorded in Table IV.

A careful study of Table IV. will demonstrate not only how the deformations vary with the amount and position of the load, but the relation that exists between the respective values of H and V at the different points in Fig. 4. In many instances the values are precisely the same, but in others—in the columns headed 2—7, 3—8, 11, and 12, for example—the value of the one is as much as ten times that of the other. We are

TABLE IV.

Load in Tons.	Load per square foot.	Position of Points in Fig. IX.																		No.
		1-6		2-7		3-8		4-9		5-10		11		12		13				
		H	V.	H.	V.	H.	V.	H.	V.	H.	V.	H.	V.	H.	V.	H.	V.			
52.67	0.239	.016	.020	.08	.14	.02	.18	.02	.02	.02	.04	.03	.14	.04	.18	.04	.10	1		
65.79	0.273	.03	.03	.02	.18	.04	.24	.02	.02	.04	.01	.04	.20	.05	.25	.05	.11	2		
80.03	0.363	.05	.01	.02	.28	.06	.34	.06	.02	.04	.01	.05	.32	.08	.37	.09	.09	3		
90.11	0.409	.01	.03	.01	.39	.08	.42	.09	.01	.07	.01	.05	.42	.11	.45	.12	.09	4		
99.97	0.418	.01	.05	.01	.46	.09	.51	.11	.03	.08	.04	.15	.50	.12	.55	.13	.09	5		
109.87	0.510	.04	.09	.02	.53	.11	.61	.13	.06	.11	.01	.07	.53	.14	.61	.15	.09	6		
130.21	0.591	.05	.09	.02	.64	.11	.74	.16	.09	.11	—	.08	.64	.16	.75	.17	.10	7		
149.94	0.691	.08	.13	.03	.80	.12	.97	.20	.13	.13	—	.09	.85	.21	1.0	.23	.13	8		
170.17	0.772	.01	.15	.07	1.1	.13	1.3	.25	.24	.16	.04	.13	.86	.21	1.3	.29	.24	9		

well aware that some students and beginners do not look with particular favour upon tabulated details, but it is a great mistake to neglect or pass them over. It is not absolutely necessary, perhaps, to closely scrutinise every item of detail, but there are certain rules which should be observed in reading all such statements. In the first place, the maxima and minima figures should

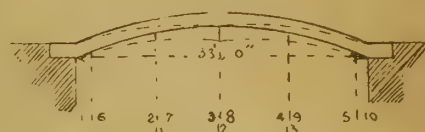


FIG. 5.

be paid attention to, and their position, and under what circumstances they occur, should be noted. Secondly, the successive increases and decrements should be compared, with the view of endeavouring to discover if any rule or law applies to them, for it is by such means that scientific men and experimentalists are enabled to frame and work out equations and formulae which are suitable for future calculations. One more recommendation is to the effect that where identities in figures are in evidence, they should be carefully inquired into, and if possible the cause of the equality in value accurately ascertained. Those who follow our instructions will find that a perusal of any table in this spirit, and with the objects in view set before our readers, will not only serve to rivet strongly the attention of the reader to his subject, but will, in addition, fix it upon his memory in a far more retentive manner than if the results were merely set forth in the general context.

It will not only be relevant to our subject, but interesting besides, to afford some information respecting the methods employed to measure and register the movements and deflections which have been already tabulated. Several modes have been adopted for the purpose, of which that represented in Fig. 6 is one of the simplest.

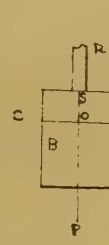


FIG. 6.



FIG. 8.



FIG. 7.

When it is required to test the deflection of an ordinary roadway or railway bridge, there are usually but one or two measurements to be made, and those in only a vertical plane, the object being to ascertain the maximum deflection at the centre of the span due to the testing load. This live or rolling load consists generally for railway bridges of two or three of the heaviest engines used on the line, according to the span of the bridge, which are coupled up and run at different speeds over the track, single or double. For an ordinary roadway bridge the whole area is frequently covered with heavy carts filled with broken stones, and a steam-roller of the greatest weight procurable is made to do service as well as the rolling load. In old times the deflections were observed with the "dumpy" or "Y" level;



but recently more accurate methods have come into use, and, by means of a very simple contrivance, the structure records automatically its own deflection.

A drawing of the little apparatus employed in registering the deflections and deformations in the testing of the two arches just described is shown in Figs. 6, 7, and 8. It has a double duty to perform, since it measures the amount of the disturbances in two directions or planes—that is, in the vertical and in the horizontal. This little simple, but effective, apparatus may be said to consist of two parts, one of which is attached to the body of the arch upon which the experiments are conducted, and the other is fixed in a determinate position, and is independent of the movements of the structure. The first part, shown in Fig. 6, is merely a small board, B, which may be painted white or any other suitable colour, upon which are drawn the two lines SP and CD at right angles to one another, thus fixing the point O in an easily ascertainable position. A rod or square bar, R, attached to the board B is cemented solidly into the intradosal soffit of the vault, and consequently when deflections and deformations take place, the board follows all of them in both the vertical and horizontal planes.

In Fig. 7, the second part of the apparatus is shown, which is a divided scale of brass or other metal, with a zero or index at the centre, marked by the small arrow in Figs. 7 and 8, and divided equally right and left from this point. The divided scale AB is maintained in a perfectly horizontal position by means of any convenient form of support—a position which remains entire, unaffected by the action of the test loading. These two component parts were adjusted as shown in Fig. 8 at all the points 1—13 marked in Fig. 4, where the deflections were measured, and the operation was thus conducted. After the apparatus had been accurately mounted so that the vertical line SP passed through the index or zero of the divided scale below, the vertical distance of the point O from the index was obtained by direct measurement. When the results of the action of any particular description of loading was required, it is obvious that as the board followed the movements of the arch, the position of O was again determined both horizontally and vertically by the distance of it in both directions from the index of the divided scale. Thus the former was directly read off right or left of the zero point, and the latter determined by direct measurement. In fact, by graduating or dividing part of the length of the line OP, and causing the common zero of it, and of the divided scale, to intersect at the arrow mark in Figs. 7 and 8, any actual measurement of the vertical position of O can be dispensed with, and the whole process of the registration of the movements of the arch recorded automatically. It is clear from the description of the apparatus that the letters H and V in Fig. 8 represent in direction the values for the same letters tabulated in Table IV. In the experiments with arches of still larger span, a different form of apparatus was employed, which rendered necessary the adoption of a somewhat different method of registration, which will be described and illustrated in a future article.

#### VILLA FARMS.

IN a letter published in Wednesday's *Times*, Messrs. Dowsett, Knight, and Co., of Lincoln's Inn-fields, renew their suggestion originally tentatively made a few years since, that those whose incomes range "along the three figures" should seek to place their houses in fields, rather than allow fields to be turned into streets. The present low prices of broad acres afford opportunities, as they point out, for creating villa farms. "Instead of suburban land at £1,000 to £5,000 an acre, rural land may," Messrs. Dowsett, Knight, and Co. point out, "be acquired at £30 per acre. Suppose an estate of 2,000 acres within 30 miles of London, lying within a mile or two of a line of a railway. A station might be opened at a suitable point of the line, and electric, cycle, or steam-carriages run on to, and through the estate, which would be divided into villa farms ranging, say, from two acres to 20 acres each, and in a few instances some would be even larger than that. The average would be, say five acres. A village street for shops and public buildings would, of course, be necessary, and the value of such a street would add successfully to the financial part of the enterprise. Expensive roads, kerbed, channelled, and sewered

would not be necessary. Material for a suitable road could be dug upon the spot, and only provision for effluent drainage would be needed. Earth closets would be in vogue, and their contents required for the land. Suburban houses with their tiny strips have no proper gardens and no playground for the children, and, as a rule, no outbuilding whatever even to put a spade in. The villa farm would have suitable outbuildings and cultivated land, as well as recreation ground, and thus give the children some small insight into country life, some opportunity for exercising their muscles on the land or in an outbuilding workshop, and thus qualify them for the stern realities of physical and intellectual strain, whether for a home or colonial career. A suburban house at £50 a year stands in a plot 40ft. by 150ft. (less than one-seventh part of an acre) and carries a ground-rent of £10 per annum. The villa farm of five acres could be purchased as freehold at £30 per acre, or held on a building lease for 99 years at a ground-rent of 30s. per acre—i.e., £7 10s. per annum. The freeholder could afford to pay the tithe or even to redeem it. The selling value of his ground-rents in the market at present prices (28 years' purchase) would be £42 per acre. We knew of an estate a few months ago of nearly 2,000 acres, 36 miles from London (not Essex), skirted by a railway and good roads, which could have been purchased at little more than £10 per acre, and no doubt plenty of land could be purchased at less than £20 per acre, so that after road-making and such effluent drainage as would be required there would remain an abundant profit on the figures quoted. Noblemen and other large landowners who are drawing very scanty net incomes from large acreages would derive very great advantages by thus developing some outlying portions of their large domains, especially such as find it difficult to get good agricultural tenants at fair rents. Lands having a light, thin soil, and therefore not very profitable to a farmer who depends entirely for his living upon what profit he can make out of his crops, are often well suited for residential purposes. An estate of 2,000 acres having already, say, two miles of frontage and cut up into an average of five-acre lots would cost for road-making (30ft. wide) and a tile drain for overflow water about £5 per acre. The supply of water could be a distinct work. Small waterworks would be constructed and the occupiers would pay by rate or meter as in other places, unless it were possible to have wells on each lot. The proposal not only applies to the country around London, but to that around every large town; indeed, land could be obtained near enough to some towns to make them altogether independent of railways, for electric, steam, and cycle carriages could run direct from the town to the land."

#### THE PLUMBERS' REGISTRATION BILL.

THE Plumbers' Registration Bill now before Parliament does not in its present form meet with unqualified approval from the examining bodies interested. Sir H. E. Roscoe, M.P., states that the executive committee of the National Association for the Promotion of Technical and Secondary Education have unanimously adopted the following resolution with reference to the Bill:—"That this executive committee is strongly of opinion that, while it is very desirable that a register should be formed of competent plumbers, and that this register might be kept by the Plumbers' Company, the general council under the Plumbers' Registration Bill should be required to place upon the register those workmen who have passed the examinations in plumbing of competent public bodies approved by the Local Government Board and who apply to be placed on it; that, with respect to clause 9, the body upon whom should devolve, subject to the orders and supervision of the general council, the carrying out of the objects of the Act should be a committee of members of the general council elected by the general council to be approved by the Local Government Board."

At a meeting held on Friday of the London Polytechnic Council, a body consisting of representatives of the City Parochial Foundation, the City and Guilds of London Institute, and the Technical Education Board of the London County Council, the following resolution was unanimously adopted:—"That this council is of opinion that the objects of the proposed Bill, so far as regards the registration of plumbers by the Plumbers'

Company, command the support and approval of the London Polytechnic Council, but that the Bill requires considerable amendment in the direction of the adequate recognition of the work and examination of the City and Guilds of London Institute, and of the substitution of some more representative body for the Plumbers' Company as defined by the Bill on whom shall devolve the carrying out the examinations and other educational objects of the Bill; also that the constitution of the General Council should be made less cumbrous and be more directly representative of educational authorities. That a copy of this resolution be sent to Mr. E. Bond, M.P., and that he be requested to secure the introduction into the Bill of such amendments as may be necessary to give effect thereto, and that copies of the same be forwarded to the Local Government Board and Education Department."

#### ELECTRIC POWER FROM THE ST. LAWRENCE.

THE enormous electric-power station at Niagara is about to be eclipsed by a still larger plant on the St. Lawrence River. This stream runs through a series of rapids near the township of Messena, and in the course of seven miles it falls upwards of 56ft. This, of itself, would not render the position applicable for the generation of water-power on a very large scale; but it happens at a distance of 3 1/2 miles from the main river there runs another—the Grass River—which takes its course through a gorge nearly 50ft. deep. The Grass River, although trifling compared with the St. Lawrence, would be accounted large here. It is 300ft. wide, and its gradient is so flat that, although it joins the St. Lawrence before the falls, there is, as stated above, an available fall of 50ft. between the two. All that is required is to cut a canal through the level plateau, and to establish a power-house on the banks of the smaller river. The long and expensive tunnel which carries away the tail water at Niagara is not needed here, and as the fall is of comparatively moderate depth, the engineering problem presents fewer difficulties. The canal, which is to be 220ft. in width at the surface, and about 26ft. in depth, will run through clay soil, with limestone rock underneath. The quantity of water which can be withdrawn from the St. Lawrence is only limited by the requirements of the navigation, which passes the rapids in a canal, and practically there is more than can be used. It is proposed to make the canal of dimensions to develop 150,000H.P., of which one-half will be rendered available in the first instance. For this purpose, 15 sets of turbines and electrical generators will be installed. The head of water in the turbine flumes will be about 19ft., while the draught tubes below the turbines, with 21ft. to the water in tail-race, make 40ft. in all. The turbines will be on horizontal shafts, two wheels on each shaft. The generator-house will, in each case, be divided from the turbine-flume by a well, through which the shaft will pass in a stuffing-box. This plan of duplicating the turbines enables the diameter to be kept small and the speed proportionately high. The outside diameter of the generators will be about 20ft., and the shaft connecting them to the turbines 22in. in diameter. The total length of the power-house, to accommodate the 15 main generators, will be 525ft., whilst in an annex there will be exciters representing 2,000H.P. It is estimated that the entire plant, including machinery for 75,000H.P., and a canal representing 150,000H.P., will cost about half a million sterling, and that the power can be sold at from 4s. to 60s. per year per horse-power, running 24 hours per day. It is anticipated that a large amount will be used in the manufacture of aluminium, which ought to be very cheap in the near future. The engineers to the scheme are Messrs. Kincaid, Waller, and Manville, of Westminster, and Mr. John Bogart, of New York.

A village hall, seated for 250 persons, was opened at Bowden, near St. Boswell's, last week. It was designed by Mr. John Wallace, architect, of Edinburgh, a native of the village, and erected by local contractors, the cost being £660.

To the old church of St. Mary, Todmorden, there has, during the last year, been added a chancel, with organ chamber and vestrie, and the old nave has been renovated. The dedication of the new chancel and the reopening of the nave will take place on the 3rd of July.



## OBITUARY.

WE regret to announce the decease, after several months' illness, of Mr. FRANK J. WALDEMAR LEVERTON, P.A.S.I., assistant surveyor in H.M. Office of Works, at Temple Chambers, Bouverie-street, E.C., on the 12th inst. Mr. Leverton, who was only 33 years of age, was originally an architectural draughtsman in the Department at Whitehall Place, but about eight years ago was promoted to be a district surveyor, and a few years since was placed in charge of the Nottingham district. A good draughtsman and efficient worker, Mr. Leverton qualified himself by examination for a district surveyorship under the Metropolitan Building Act, and also took the special Sanitary Science certificate of the Surveyors' Institute, of which he had been since May, 1891, a Professional Associate. At the close of last year he was promoted to the charge of the Bristol district; but, almost as soon as he had taken up his fresh appointment, he was laid aside by the internal disease to which he eventually succumbed. He married a daughter of Mr. Bedbrook, chief inspector of naval machinery, who, in addition to nursing her husband through his long illness, has been editing for some months past the *Spinning Wheel*, the official organ of the Royal Guild of Needlework. The funeral took place at Norwood Cemetery on Saturday last, and was attended by a deputation of five representatives of H.M. Office of Works as a mark of the high respect in which he was held by his former colleagues.

THE death is announced of Mr. LAVINGTON E. FLETCHER, the well-known chief engineer of the Manchester Steam-Users' Association, at the age of 75 years. Mr. Fletcher carried out much experimental work in connection with steam-generating plant and in pointing out the causes of boiler explosions. He held the position of chief engineer for 35 years, and it is not too much to say that to his teaching we owe much of the present comparative immunity from the disastrous results of what are termed boiler explosions, which in days gone by were mainly due to simple want of care.

## CHIPS.

H.M. Board of Works, under whose care is placed the Castle at Scarborough, are busily engaged in restoring the fabric, which has recently shown signs of decay.

The Southall Urban District Council having applied to the Local Government Board for sanction to borrow £3,482 for purposes of streets improvements, £1,316 for purposes of sewerage and sewage disposal, and £804 for the provision of fire-extinguishing appliances and hydrants, Colonel John Ord Hasted, R.E., has held an inquiry into the matter.

A stained glass window has been placed in the south side of the Heathcote Chapel of the parish church of Melksham, in memory of the late General Moule. The saints represented are St. Stephen, St. Peter, St. Barnabas, and St. Bartholomew.

The reopening of the organ at St. Michael's Church, Exeter, took place last week. Extensive additions and alterations have been made to the instrument by Messrs. Hele and Co., organ builders, of Exeter.

The Leeds Art Gallery Sub-Committee have decided to recommend the purchase of three works which have been shown in the spring exhibition. They consist of two water-colours, "The Old Barn Door," and "Sunlight on the Hills," by G. C. Haité, and a large oil painting by Thomas Millie Dow, entitled, "A village in the Apennines." The Free Public Library Committee have confirmed this recommendation. The committee also resolved to purchase, subject to the approval of the City Council, oil paintings by Alfred East, Madame Ronner, R. Vicat Cole, James Clark, Owen Bower, W. L. Llewellyn, and R. C. Robertson. It was, at the same time, decided to buy a metal plaque by G. Bayes, a bronze statuette by Beguina, and a bronze door-knocker by the late Alfred Stevens.

The new railway mileage opened in India during the twelve months ended March 31st last was considerably under that of the previous twelve months, the figures being 713 miles as compared with 821 miles. But the total for 1895-6 was much above the average, and therefore the 713 miles of last year represents a fair addition to the aggregate length of track in existence in our dependency. The total length of track now in operation in India is 20,390 miles, as compared with 19,677 miles in 1895-6, 18,885 miles in 1894-5, 18,500 miles in 1893-4, 17,571 miles in 1891-2, and 13,398 miles in 1886-7. In other words, the increase in the past five years has run to 2,819 miles, and in the past ten years to 6,992 miles.

## Building Intelligence.

ASLACKBY.—The parish church at Aslackby, which has been undergoing extensive alterations and improvements for some time, was formally re-opened on Tuesday week by the Bishop of Lincoln. The fabric of the church has been entirely renovated, a new roof has been put upon each of the aisles, and that of the nave made secure. The old-fashioned pews have been cleared away, and new chairs have taken their place. The floor of the nave has been paved with wood blocks upon a bed of concrete. The tower, which was originally partitioned off from the nave, has now been thrown open to the rest of the church, and the west window, which was previously hidden, is now exposed to view. New doors have been hung, the wall thoroughly cleaned and restored, and the church well lighted with oil lamps. Prior to his death the late Mr. James Fowler, F.S.A., architect, Louth, visited the church and reported upon its condition, and the present work has been carried out to his plans under the superintendence of his son, Mr. Reginald Fowler. The contractors were Messrs. Walter and Hensman, of Horncastle. About £800 has been spent on the work.

BIRMINGHAM.—In view of the opening of the new General Hospital the corporation is pushing on the improvements at the junction of Steelhouse-lane and Corporation-street. The council decided, in deference to a generally expressed wish, to set back the street line at this corner, chiefly to open up the view of the noble architecture of the new hospital. A piece of land, formerly covered by unsightly buildings, and having an area of 355 square yards, was given up by the Committee of the Improvement Scheme, while the authorities of the General Hospital gave up a slightly larger portion opposite, at the corner of Steelhouse-lane and Loveday-street. The result is that Steelhouse-lane at this point, instead of being a gullet, is now a wide street debouching into a spacious junction at the corner of Lancaster-street and Corporation-street. The condemned buildings have been cleared away, and the angle made by Corporation-street and Steelhouse-lane has been rounded off, and provided with a wide footway.

BLAKESLEY.—The parish church of St. Mary, Blakesley, was reopened on Wednesday in last week, after the erection of a new chancel, a new reredos, and two new stained windows, while a new organ has also been built. The work has been carried out under the superintendence of Messrs. Law and Harris, architects, Northampton. The chancel, the foundation of which has been laid on the foundation of the old chancel, has been built in the Early Decorated style, so as to harmonise with the older fabric; 10ft. has been added to its length. The roof is of open timber, pitch-pine; and the floor, which has been raised from 12in. to 18in., is of antique tiles, many of which have been preserved from the old chancel. The reredos (from designs by Messrs. Law and Harris), by Messrs. Hems and Sons, of Exeter, is constructed of polished Staffordshire alabaster, resting upon Caen stone ashlar. The reredos proper is entirely of alabaster, having in its midst a sculptured representation, modelled in high relief, of the Last Supper. This is in a block of white Castellino marble. On either side are lesser panels, in which are recessed vassica. The wings of the reredos, which connect it with the north and south walls of the sanctuary, consist of arcading, all designed like the rest in the Early Decorated style. In the recesses are marble panels, in which the Commandments, Creed, and Lord's Prayer are incised and gilded. The stained-glass windows are all dressed in Bath stone. The east window consists of three lights with circular heads, and represents the Crucifixion. The two side windows treat of the Annunciation and of the Resurrection, and they are placed on the north and south side of the chancel respectively. The whole of the building in connection with the alterations has been done by Mr. J. S. Constable, of Blakesley, and, save for the Bath stone used in the window-dressing, local stone has been utilised.

CHESTER.—At the last meeting of the Chester City Council, a long discussion arose on the baths question, several members condemning what they described as the bungling of the committee. These remarks had reference to the fact that baths having been decided on, the committee had

paid a premium for the design of a scheme which was to cost no more than £8,000, that the lowest tender for carrying out the scheme was nearly £13,000, that after several adjournments and debates it was decided to proceed with the scheme at the increased cost, and that now the committee recommended a final settlement with the architect and quantity surveyor by the payment to them of £580, the intention being to submit another scheme to the council. Eventually the recommendation to settle with the present architect was carried.

COVENTRY.—One of the largest of the building schemes connected with the expansion of Coventry, says the local *Herald*, is that now being undertaken by Messrs. McCarthy and Co. on the north-west side of the city. The land to be opened up comprises about 26 acres, and will be intersected by two main thoroughfares, one starting from the northern end, and the other from the southern end, of the estate, and converging at a point at the rear of Bishopgate-green, where they will unite and cross the canal by a bridge, costing some £1,800. Several houses about the middle of Bishopgate-green have been acquired in order to get an outlet to the Foleshill-road. Eight other shorter streets will open up the intervening land. Negotiations are proceeding for the erection upon the site of three large factories connected with the iron and mechanical trades. The other portions of the land will be offered for sale in building plots.

DOVER.—On Monday evening, the 14th inst., the new Tivoli Theatre at Dover was opened to the public. The theatre has been erected on the site of the old Clarence Theatre, and some adjoining property has been acquired to enlarge the space available. The building is well equipped in all its requirements, and the auditorium has seating accommodation for about 800 people. The architects for the work were Mr. C. J. Phipps, F.S.A. (who died a few weeks before the theatre was opened), and Mr. Arthur Blomfield Jackson, of 26, Mecklenburgh-square, London. The general builders' work was executed by Mr. H. Richardson, of Dover, and Messrs. Beer and Gash, of London, were employed to complete certain technical details involved in the construction of theatres.

LEEDS.—The new Congregational chapel in Woodsley-road, Leeds, was opened on Saturday. The new buildings comprise a chapel, 57ft. by 38ft., with gallery, to seat 500 persons; a school-room, 55ft. by 30ft., for 400 scholars; a large classroom, 21ft. by 19ft., six classrooms opening out from the schoolroom, minister's vestry, and requisite conveniences. Only the chapel, minister's vestry, and large classroom have so far been built. The structure is in the Classic style, the walls being of pressed bricks with stone dressings. The internal woodwork is of pitch-pine. The whole has been erected from the designs and under the superintendence of Mr. G. F. Danby, architect, Leeds. The total cost will be about £3,300.

LUNDY ISLAND.—The new church of St. Helen, on this island, was consecrated by the Bishop of Exeter on Thursday in last week. Mr. John Norton, F.R.I.B.A., of 95, Ridgmount-gardens, W.C., is the architect. The style is very Early Decorated, the same as was the former church, which, built in the late years of Edward I.'s reign, is now naught but mouldering foundations. With a resident population of little more than three score souls the church is naturally small. Seating accommodation for full 160 worshippers has been provided. The measurements of the fabric inside are as follows:—Nave, 50ft. by 28ft.; chancel, 25ft. by 25ft.; and vestry, 14ft. by 16ft. The tower is 65ft. high, and stands upon a cliff 400ft. above the sea. The various roofs are of steep pitch, and covered in by split stone slabs from the Ledbury quarries. Under these stones is a double lining of felt upon the inner roof. The ridges are of red terracotta, and the cornice angles of tower and turret are defined by carved gurgoyles. The eastern window is kept up, so as not to cut into the sculptured reredos. The building is of finely axed granite, the island's own light grey variety, quarried and masoned on the spot, with dressings from the Doulton quarries in Somersetshire. The superaltar of the reredos is of veined alabaster, and the main portions of the reredos proper are divided into three divisions, gabled and crocketed, and flanked by clustered columns of polished Purbeck marble. The sculpture is in exceptionally high relief, and is in white marble. The centre panel is a representation of the ordinance of the Last Supper. The one on



the south side illustrates the Atonement, as exemplified by the sacrifice of the scapegoat, and on the north the institution of the Passover. There is in the belfry a peal of bells, by Carr, of Smethwick. The pulpit, font, altar screen, as well as the sculptured roredos, are the handiwork of Messrs. Hems and Sons, sculptors, of Exeter; the general contractors for the work are Messrs. Britton and Pickett, builders, Ilfracombe. The total cost of the edifice will not fall short of £8,000.

**MANCHESTER.**—The new wing of the Primitive Methodist College in Alexandra-road, Manchester, was opened on Saturday by Mr. W. P. Hartley, Aintree, who bears the entire cost of the new building. The college, as now completed, consists of a long and varied façade to Alexandra-road, with two extensive wings at right angles, one at each end of the façade, the whole forming three sides of an inner court or quadrangle. The extension comprises the greater portion of the frontage and one of the wings. It has doubled the accommodation for students in the college from thirty to sixty, enlarged and rendered more suitable the principal's house, and has added several important public rooms formerly lacking. The new portion of the main façade consists of the enlargement of the principal's house, a large dining-hall, reception-rooms, a library, and a large assembly-hall. At the junction of this frontage with the students' new wing is to be built a clock tower some 85ft. high. The clock faces are to be illuminated, and the belfry is to be fitted with Cambridge chimes. The architect is Mr. J. Gibbons Sankey, Manchester and London.

**NELSON, LANCS.**—A Sunday school, which has been erected behind the Carr-road Baptist chapel, from plans prepared by Mr. Harry Whitaker, architect, of Nelson, who has also officiated as clerk of works, was opened last week. The school will accommodate 800 scholars, and has cost between £4,000 and £5,000. The premises front into Every-street and have two entrance corridors, giving access to the infants' room, assembly hall, and gallery floor. The infants' room, 26ft. 6in. by 14ft. 6in., is situate between these entrances. Galleries are ranged on three sides of the assembly hall. The hall itself is 72ft. by 40ft. On each side of it are class-rooms, twenty in all, one side of each classroom being filled with wood framing and glass panels to give additional light to the assembly hall. No pillars interfere with the view of the platform from any part of the assembly hall. There are also senior females' classroom, 21ft. 6in. by 19ft., senior males' classroom, 18ft. by 17ft. 6in., and a lecture hall, 28ft. 6in. by 17ft. 6in., gymnasium of the same dimensions, kitchen, and heating chamber. The premises are heated with a low-pressure hot-water apparatus. Electric light and bells have been applied throughout. Contracts have been executed by the following firms, viz.:—Brickwork and masonry, Messrs. A. and R. Parker, Burnley; carpentry and joinery, Messrs. R. Dean and Sons, Burnley; carving, Mr. Mooney, Burnley. Electric fittings have been supplied by Mr. Thomas Powers, of Manchester.

**SHERNBORNE, NORFOLK.**—At Norwich Consistory Court, on the 16th inst., Mr. Chancellor Blofeld granted a faculty to the vicar and churchwardens of the parish of Sherborne, near Sandringham, for the restoration of the church of that parish. This is a small flint-built structure, Early English in style. Its ancient font is one of the finest examples in the county. The fabric was in a very dilapidated condition when, some few years since, the Prince of Wales purchased an estate in the neighbourhood of which the parish forms a part. One of his first acts of ownership was to look to the condition of the little church in which the parishioners had for centuries been accustomed to worship. Plans have been prepared by Mr. H. J. Green, the Diocesan architect, by which the chancel and south aisle are to be rebuilt, new roofs provided, the church reseated, and the general repairs of the fabric carried out satisfactorily. The estimated cost of this extensive restoration of a sanctuary which provides sitting accommodation for about 70 people is £1,500, and the Prince of Wales has contributed £1,000 to this amount.

**TUNBRIDGE WELLS.**—New schools for St. Barnabas parish were opened on Wednesday week. The building is a red brick structure, built on two floors, and will accommodate 450 scholars. The ground floor is to be devoted to the infants. Its accommodation comprises a

room 71ft. by 22ft., and a class-room 25ft. by 24ft., each having a pitch of 15ft. On the upper floor there will be a mixed school for boys and girls. Here there is another room, 71ft. by 22ft., and a couple of classrooms, each 25ft. by 22ft. Cloak-room and lavatory accommodation has been provided on a mezzanine floor. The staircases and landings are of granolithic paving. Glazed sliding screens are placed between the principal rooms and classrooms. The heating will be by means of Tortoise stoves, having jambs and hearths of glazed tiles, and gas is laid on. The interior walls are lined with stained boarding and the roof with Broseley tiles on boarding and felt, and the building is surmounted by a bell turret used also for ventilating purposes. In the upper rooms the floors are laid with pitch-pine in narrow widths, and the ground floors are of pitch-pine wood blocks. The playground occupies about two-thirds of the half-an-acre site. It is divided between the boys and girls. The architects are Messrs. H. H. and E. Cronk, and the builder Mr. Judd.—The new Borough Baths, the foundation-stone of which was laid by the Mayor on Tuesday, are being erected from plans by the Borough Engineer, Mr. T. W. Mellor. The swimming bath will have a water area of 90ft. by 35ft., and a depth varying from 3ft. 6in. to 6ft. 6in., which can be increased to 4ft. and 7ft. for purposes of fêtes. The sides of the bath will be of white enamelled bricks, and the bottom of white marble mosaic, with lines for the guidance of swimmers under water. The mosaic of the footway round the baths and the dressing-boxes will be a mosaic of a redder hue. The dressing-boxes will be each side of the bath, and like the rest of the woodwork of pitch-pine, and will consist of half-doors, with a brass rod and curtain for the upper part. A gallery with wrought-iron railings surrounds the building and will seat nearly 400 spectators. The roof will be partly pitch-pine and partly glass with ornamental girders, below which will be clusters of lights. A heating coil has been gathered round the glass lantern of the roof in order to avoid condensation; while the boiler power does not err on the side of inadequacy of heating power for the considerable volume of water, which will amount to nearly 100,000 gallons. The electric light will be installed. The bath will be tiled, as well as the walls up to the height of the gallery. The polo posts and nets will be raised and lowered from the roof, and the diving stage will also be movable, as well as the steps in the corners of the bath. The walls to dado height will be of cream enamel brick, and the upper part of red brick with moulded cornice. A shower bath will also be provided at one end of the swimming-bath, and a water "chute" can be added if required. The slipper-baths will be on the Monson-road side, and at the other end is a club-room, the boiler-houses, a small laundry, and lavatory accommodation, while here will be situated the chimney-shaft, which will be carried to a height of 70ft. As regards the slipper-baths, those for ladies and gentlemen will be entirely separate. There will be four first-class and six second for gentlemen, and two first-class and four second-class for ladies, each approached by different entrances. Each slipper-bath, in addition to its supply of hot and cold water, will also be fitted with a shower-bath.

The partnership heretofore subsisting between G. Drinkwater and F. Austin, builders and contractors, Northwich, under the style of Drinkwater and Austin, has been dissolved.

A new octagonal font has been placed in Tanfield Church this week. The bottom step is of Frosterly fossil. The centre shaft is green, clustered with rouge jasper columns, with black and gold caps and bases. This stands on an upper step of Victoria red marble, surmounted with mouldings of the same. The bowl is of selected Carrara marble, panelled with a medallion of the Queen and shields bearing dates of Coronation and Jubilee and the vicar's crest. Mr. Angrove, of Newcastle, executed the work.

Herr Hofrath Arthur von Scala has just been gazetted Director of the Austrian Art and Industry Museum, founded in 1863 on the model of the South Kensington Museum, and at present the centre of industrial art in Austria. The new director is well known in England as the former head of the Vienna Oriental Museum, which has been transformed into the Austrian Museum of Commerce, and as the organiser of the Exhibition of Oriental Ceramics in 1884, and of Oriental Carpets and Tapestries in 1891. Hofrath von Scala states that it is his intention to co-operate with South Kensington.

## Engineering Notes.

**HASTINGS.**—The Marquis of Dufferin and Ava, ex-Lord Warden of the Cinque Ports, laid on June the 16th the inaugural stone of the harbour in course of construction at Hastings. The work is promoted by local men, the contract price being £150,000. Some alterations, however, have been necessitated by the discovery of a mudbank, which will involve a further outlay. The acreage of the harbour in the deep part is to be 27 acres. The two arms will be of the total length of 3,000ft. The harbour at spring tides will have a draught of 13ft. of water, and the breakwaters will be 10ft. above high tide, the foundation structure being 15ft., and the superstructure 28ft. 6in. It is hoped to complete the western arm this year and to finish the eastern arm next year. Mr. Carey, C.E., is the engineer.

**MONTREAL.**—The active work of enlarging the Victoria Bridge at Montreal will be begun within the next month, and will be completed in 11 or 12 months. It is expected that more than £300,000 sterling will be spent on the work, and employment given to hundreds of men. The work of reconstruction will be done without interfering in any way with the operation of trains over the bridge. The contract for the reconstruction of the bridge has been let jointly to the Dominion Bridge Company, of Montreal, which contracted for the full capacity of its works, and the Detroit Iron and Bridge Company, which takes the remainder of the work. The bridge when completed will be an open-truss steel structure, with double steel tracks and facilities for foot passengers, vehicles, and electric railways.

**PILNING AND AVONMOUTH RAILWAY.**—For the past eleven years or so, ever since the Severn Tunnel has been opened for railway traffic from the shores of Gloucestershire to the districts of South Wales, there have been a couple of miles of railway plant from Piling to New Passage thrown into a state of disuse because the line that conveyed passengers and goods to the ferry-boats at New Passage was rendered unnecessary. But by this time next summer the greater part of the line from Piling to New Passage will be used again as a portion of a much-needed line between Piling and Avonmouth. The length of new line, which is being carried out by the Great Western Railway, is a few chains short of six miles, and taking Piling station as the starting-point, a mile or so of the old line used to the New Passage ferry-boats is employed, so that the new plant commences at the pill at Redwick. The line is over practically level ground. There have had to be no cuttings made, and no rocky formations have been encountered. Bridges have been provided for crossing the pills or small streams running into the river, and the principal bridge is near the rifle-butts at Avonmouth, which will have to be removed for the purposes of the railway. This bridge consists of three girder spans, the centre span being about 40ft., and supported on two pairs of cylinders each about 4ft. 6in. in diameter. The cylinders are being sunk through the mud and clay to solid foundations from 50ft. to 60ft. below the surface. Other pill bridges, four in number, are provided with girders with 40ft. openings, and they will be supported with masonry buttresses for which piling has been used to furnish a solid and firm foundation. The main road has been taken over the railway at Redwick by an embanked road and girder bridge, and this is the only case where the road intersects the line. The line crosses over the Severn Tunnel close to its Gloucestershire or southern entrance. Mr. W. A. Cashman is the engineer representing the G.W.R., and the contractor is Mr. F. C. Calfin.

A monument has been erected in Tardebigge Churchyard in memory of the late Sir Augustus Paget, father of Lady Windsor. The memorial consists of a York stone cross, upon three massive steps, surrounded by a kerb, and a record-stone bears an inscription.

When a tower was added to Hartford Church some ten years ago, provision was made for the fixing of a peal of eight bells. This has now been partially provided. On Wednesday week the new peal—which at present only consists of six bells—was dedicated. The founders are Messrs. Taylor and Sons, of Loughborough. The tenor bell weighs 13cw. The total cost of bells and fittings, including a carved screen to shut off the belfry from the rest of the church, is £400.



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## ILLUSTRATIONS.

SECOND PREMIATED DESIGN FOR THE BELFAST TOWN HALL.  
—PASSMORE EDWARDS HOMES FOR EPILEPTICS AT CHALFONT ST. PETER'S.—XVIII. PARK LANE, W.—  
CONVALESCENT HOME FOR THE PARALYSED AND EPILEPTIC AT EAST FINCHLEY.—ST. MARY'S PRIORY CHURCH, CARTMEL.—THE YOUNG MEN'S INSTITUTE, COWBRIDGE.

## Our Illustrations.

## NEW CITY HALL, BELFAST.

LAST week we illustrated the selected design for these buildings, and to-day we give Messrs. Malcolm Stark and Rowntree's design, placed second in the recent final competition. The plans given, with the view and principal elevations, will enable our readers to compare the two schemes, which in many ways are very different in their arrangements. No special particulars have reached us in description of this design, however. The isolated location of the great hall to the rear is quite a distinguishing feature of the plan, and the main staircase in the municipal buildings rising right and left is an uncommon arrangement somewhat open to criticism. Mr. J. Miller, I.A., of Glasgow, who was announced as the author of the third premiated design, writes to say that the Assessors made no official distinction between the merits of his design and that of Messrs. Malcolm Stark and Rowntree. All we can remark in respect to this, is that the result of the competition as published by us on April 23 last was given in the order in which it was officially communicated, and as there has been no correction made, the award, as thus stated, was naturally adopted as the correct one. In fact, this order, whenever the architects' names were mentioned, has always been observed in all the communications from the City authorities which have reached us. Mr. Miller promises to send us his drawings for illustration.

COLONY FOR EPILEPTICS, CHALFONT ST. PETER'S  
—PASSMORE EDWARDS HOMES FOR BOYS AND GIRLS.

THESE two Diamond Jubilee buildings, forming a part of the series of Homes for Epileptics given by Mr. J. Passmore Edwards to the National Society for the Employment of Epileptics, are about to be erected on the colony farm estate at Chalfont St. Peter's, Bucks, and are designed for the use of boys and girls. They will stand near the Recreation Hall, and will face the west. The dormitories, ranging north and south, with a sickward beyond, are located towards the east. A playshed in each building is provided towards the south, and the administrative department is placed towards the north. Nurses' rooms in both buildings are on the first floor, but the patients are throughout provided for on the bungalow plan.\* Since these sketches were made the plans have been slightly modified, but not reduced in size, and the elevations remain substantially as shown. Mr. Maurice B. Adams, F.R.I.B.A., is the architect.

XVIII. PARK LANE, LONDON, W.

THIS house is now in course of construction for Mr. Whitaker Wright, from the designs and

\* We give a reproduction of the plan of one of these homes, but in execution the boys' and girls' houses will be transposed. The accommodation is practically identical.



under the superintendence of the architect, Mr. George Lethbridge, A.R.I.B.A., of 7, Draper's-gardens, Throgmorton-avenue. The front is of Portland stone, the back and walls of domestic offices in basement are faced with glazed bricks. The principal staircase is of oak, and the back staircase of stone. A passenger-lift from basement to third floor and a service-lift from basement to ground floor will be fixed. The joiners' work throughout will be of the best description and will be in wainscot and Spanish mahogany, except in basement and servants' bedrooms. The hall, staircase, and reception-rooms will have carved and panelled wood dadoes. The reception-rooms and principal bedrooms solid parquetry floors, mosaic floor in hall and corridor ground floor. The ceilings of principal rooms will be executed in ornamental plaster, that of billiard-room having mahogany beams, cornice, &c. The house will be fitted throughout with the electric light. The general contractors are Messrs. Colls and Sons, 5, Coleman-street, E.C.; floors, Messrs. Fawcett and Co.; electric lighting, Messrs. Strode and Co.; lifts, Messrs. Archibald Smith and Stevens; ornamental plasterwork, Messrs. G. Jackson and Sons.

## CONVALESCENT HOME AT EAST FINCHLEY.

For description and further sketch see page 908.

## ST. MARY'S CHURCH, CARTMEL.

CARTMEL is a scattered village or township in the farming district in the extreme north of Lancashire. The church was built and dedicated in the year 1183, connected with some monastery, and under the care of a prior; but, as the drawing by Mr. E. Eldon Deane, an old contributor to the BUILDING NEWS, shows, it has undergone wonderful transformation. The signal peculiarity outside is the double tower, the upper one being built diagonally in plan over the other, supported below on arches, springing from piers or columns at the junction of nave, choir, and transept. There are four columns and five arches to the nave, and along these there must be a considerable thrust from the tower superstructure, and doubtless this explains the extremely bold and massive

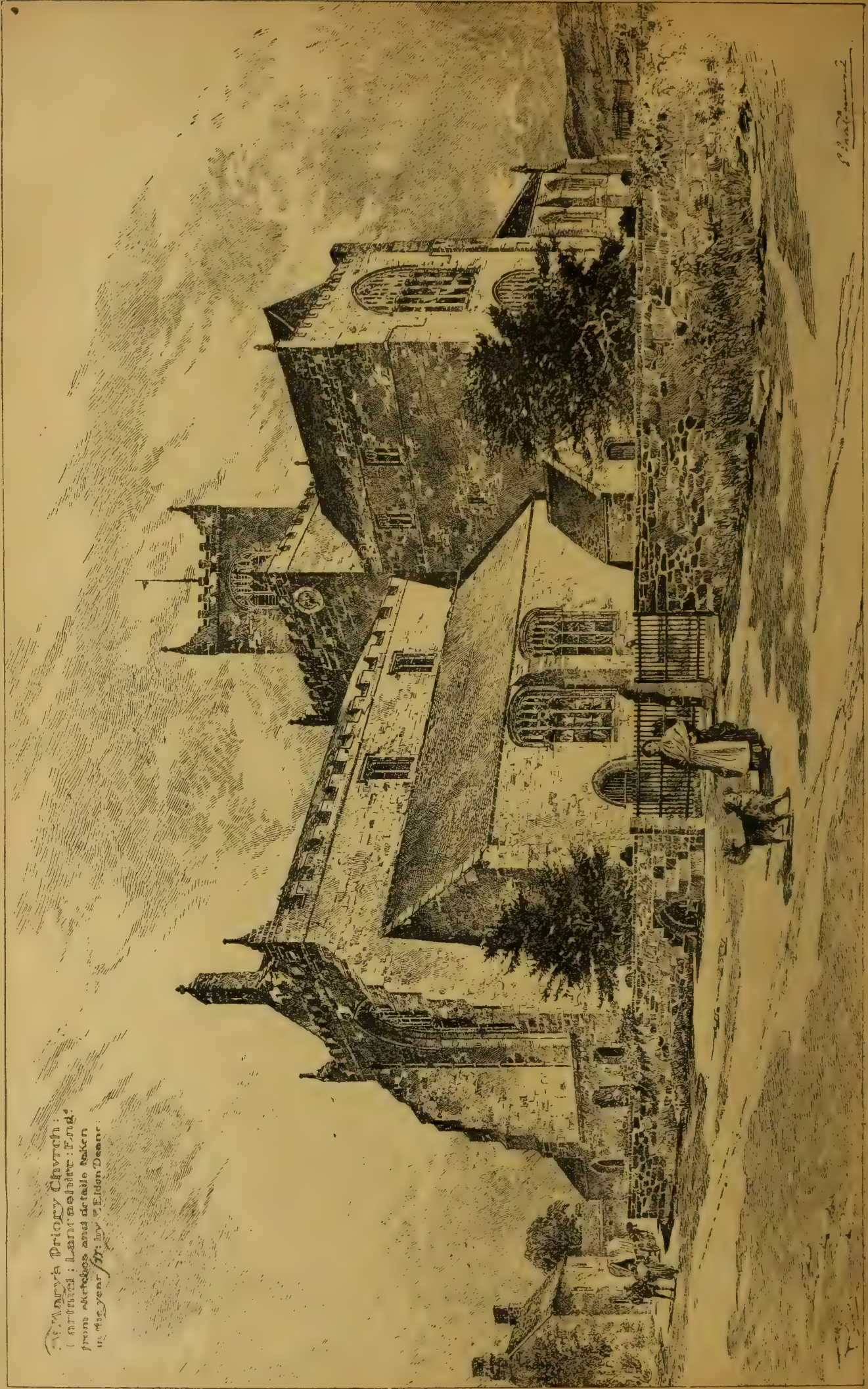
buttresses shown in the west end. A feature in these buttresses is the way they are shouldered out from the top.

## THE YOUNG MEN'S INSTITUTE, COWBRIDGE, GLAMORGANSHIRE.

THIS little building stands nearly in the centre of the town, to the rear of the town hall. The plan gives a small lecture hall, which is also designed for use as a clubroom, the lobby at the farthest end being especially provided with a small inspection door, through which the club members whisper the pass-word. There is a general reading-room and a study-room, the latter so-called by the original promoter and largest donor, the late Mr. Nathaniel Bird, who gave £500. There is a loft over main entrance lobby, in which is placed a cistern, into which a considerable quantity of rain-water is let from the back roofs, this supplies the lavatory, &c. There is an e.c. and chamber for storage of dry earth, and a coal place. At the back of the site, room is reserved for a caretaker's cottage. The style, Modified Tudor, is an attempt to work in the style which may be said to be the vernacular of the district, which abounds, though fast disappearing, with remains of Tudor domestic work, and which seems to be eminently adapted to the building material of the district. The building stone was quarried close to the west gate of the town. The dressings are of Monk's Park stone, the slates are green, the roof timbers and joiners' work are of pitch-pine, the hall roof is open, and those of the other rooms partially so. The grates are of the Pridgin Teale kind, with glazed brick jambs and arches and stone mantelselves. The iron casements and hoppers are of Hope's make, and the guttering of Macfarlane's. Picture-rails run round the rooms, and the hall has a glazed, reeded band running round at a height of 3ft. 6in. from floor. All the rooms are distempered—the hall in two tints: Indian red below the reeded band, and olive green above. The cost of the building, including the outside pavement, was £748 19s. 10d. The builder was Mr. W. A. James, of Cowbridge, and the architect Mr. Robert Williams, F.R.I.B.A.



St. Mary's Priory Church:  
(continued). Landscapes: Eng.  
from sketches and details taken  
in the year 1891 by E. E. Deane.



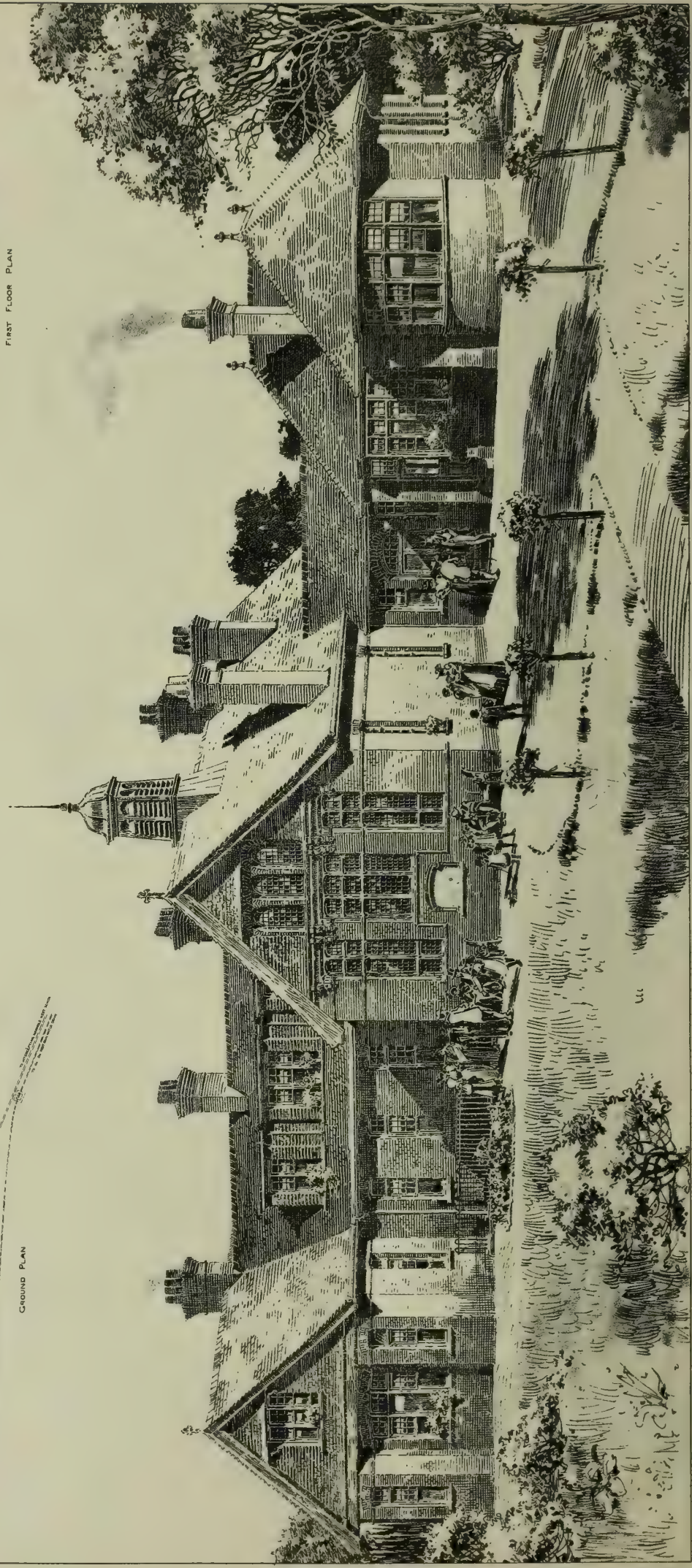
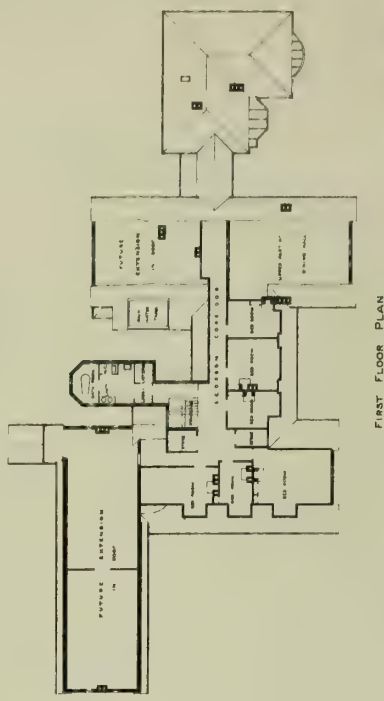
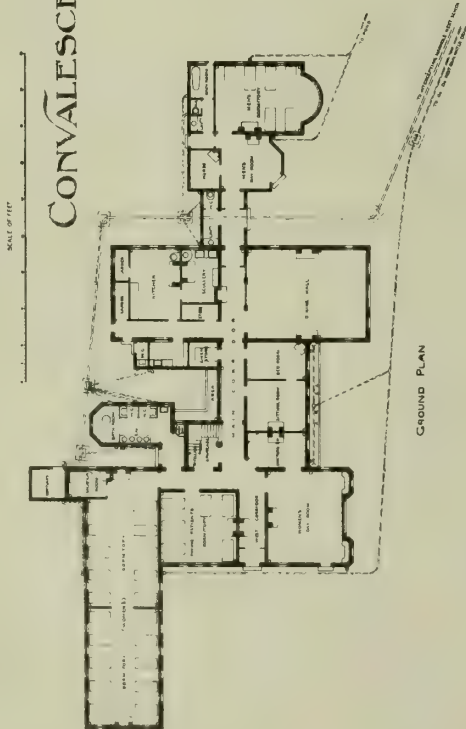
St. Mary's Priory Church







CONVALESCENT HOME AT EAST FINCHLEY.  
R. LANGTON COLE, A.R.I.B.A., ARCHITECT.

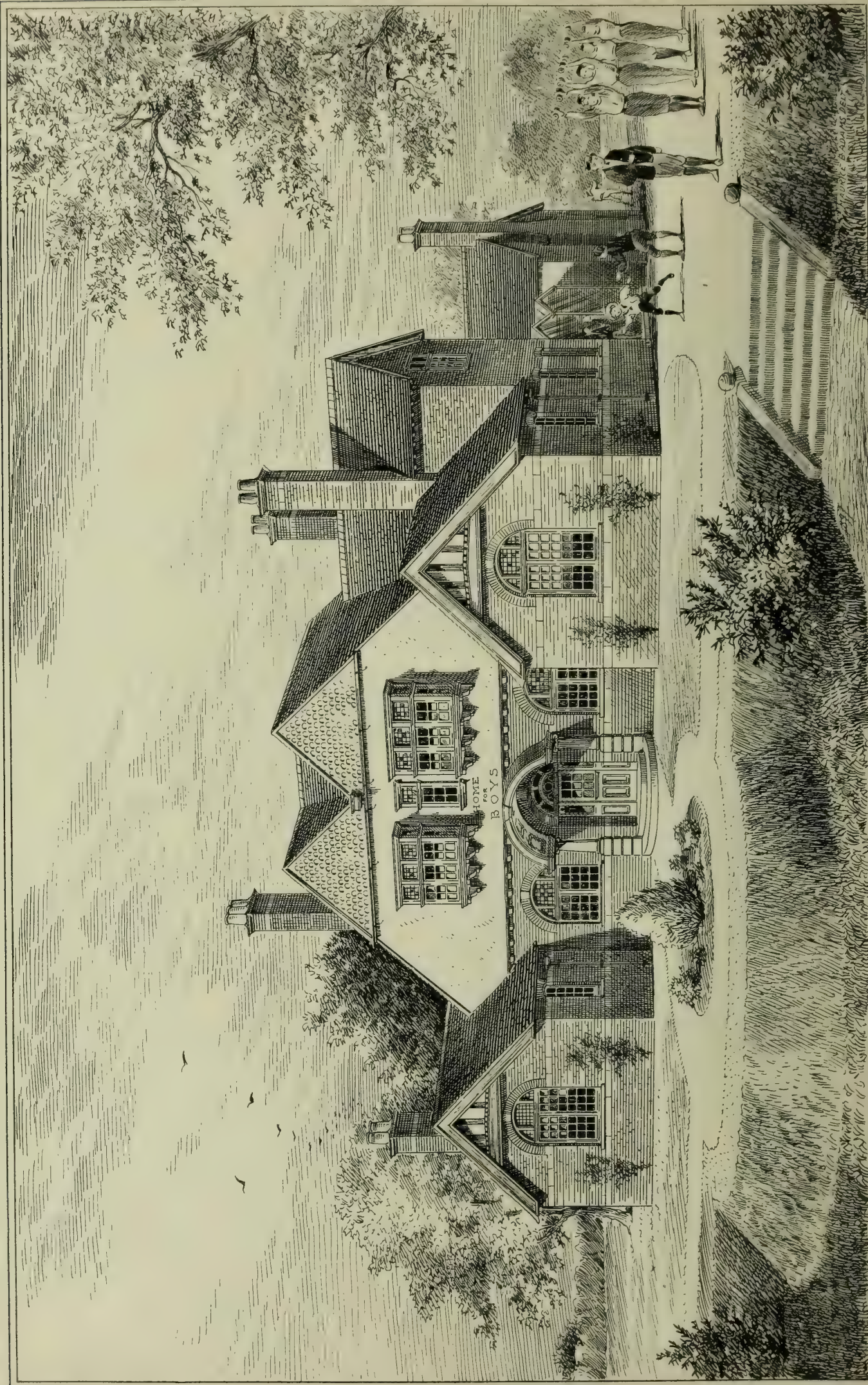


"PHOTO-TINT" by James A. K. 1897









PASSMORE EDWARDS' HOME FOR BOYS CHALFONT ST PETERS' BUCKS FOR THE NATIONAL SOCIETY FOR EMPLOYMENT OF EPILEPTICS

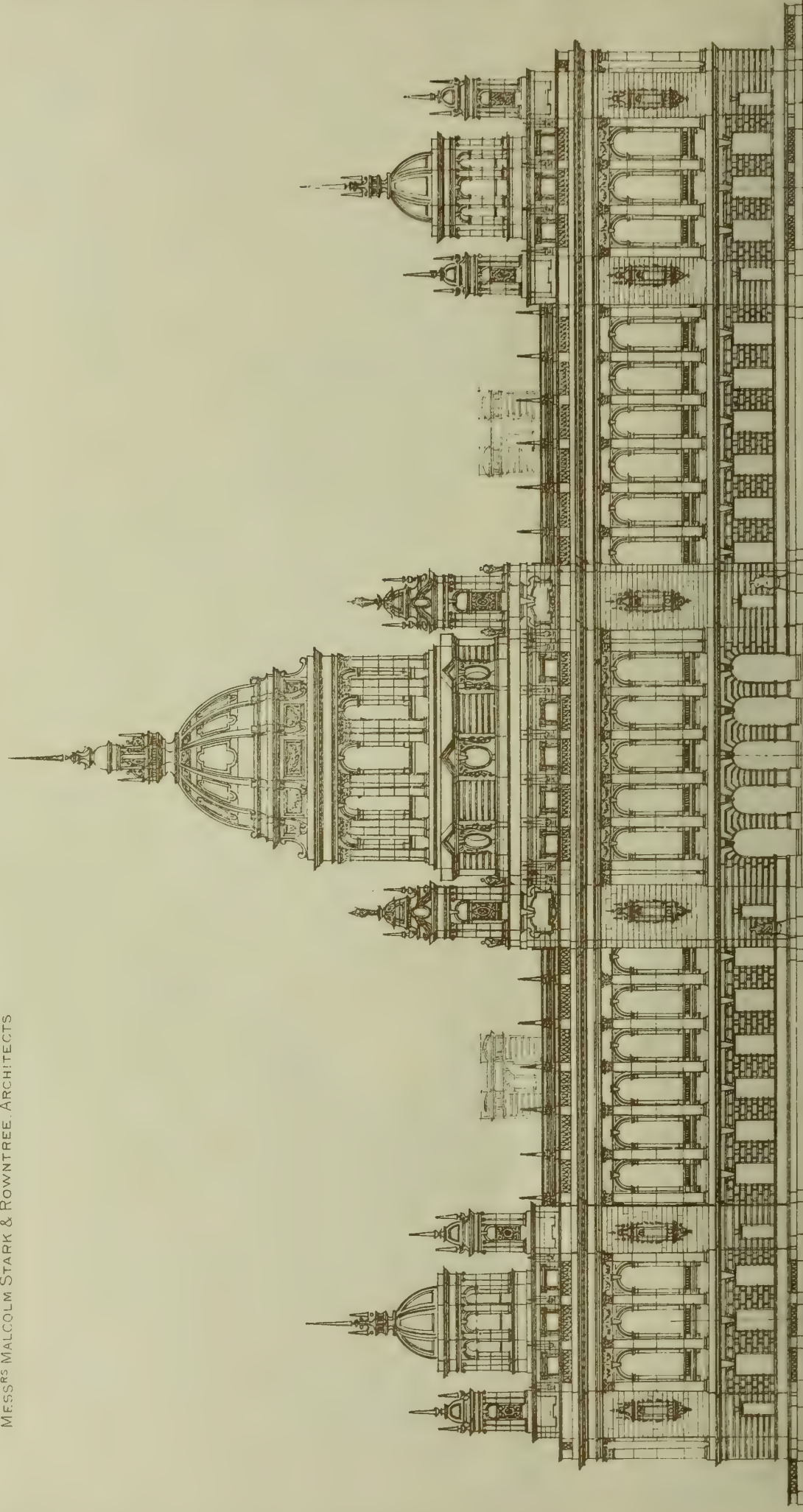






BELFAST CITY HALL. SECOND PREMIAED DESIGN

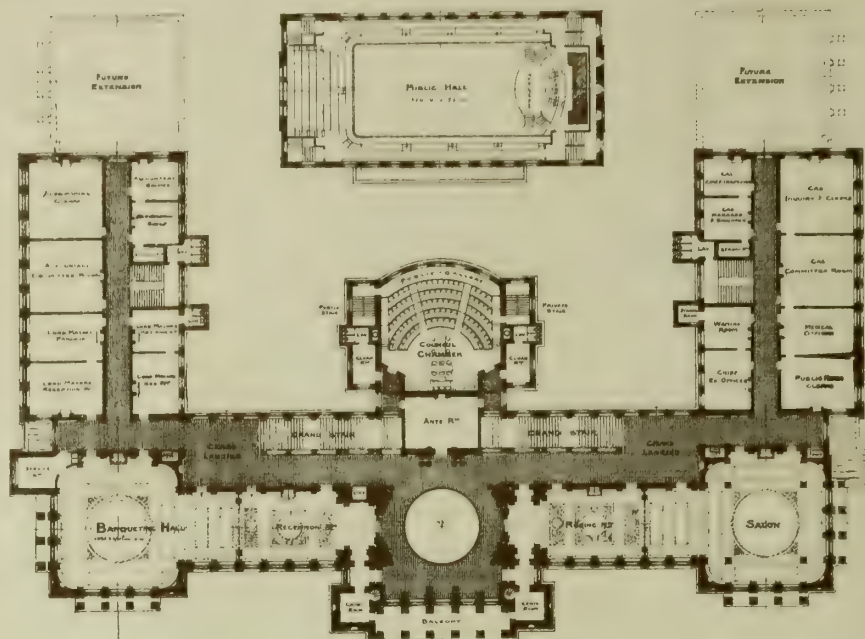
MESSRS MALCOLM STARK & ROWNTREE, ARCHITECTS



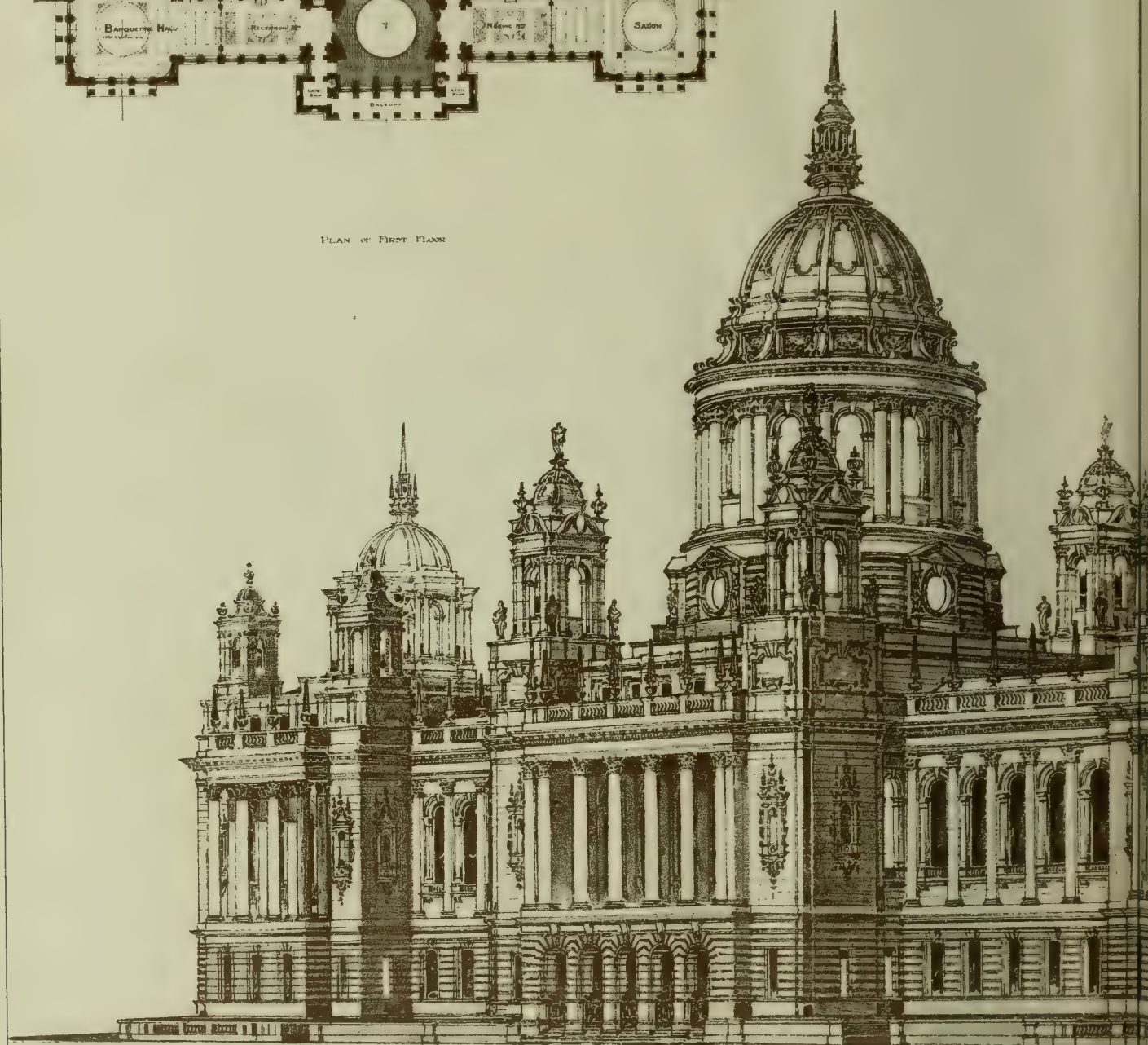




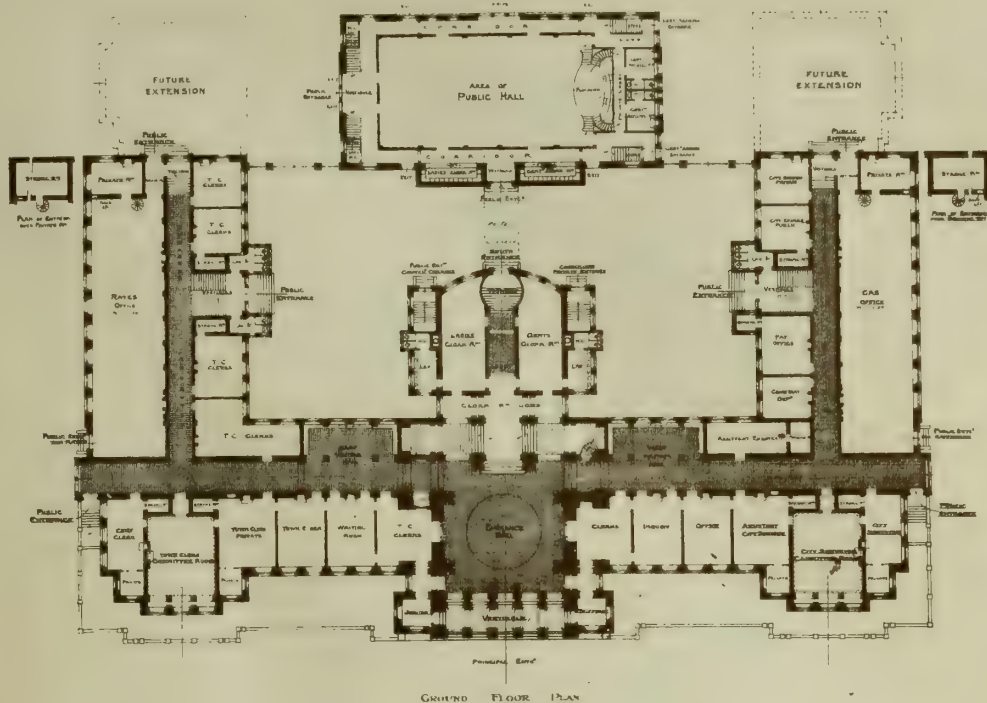




PLAN OF FIRST FLOOR















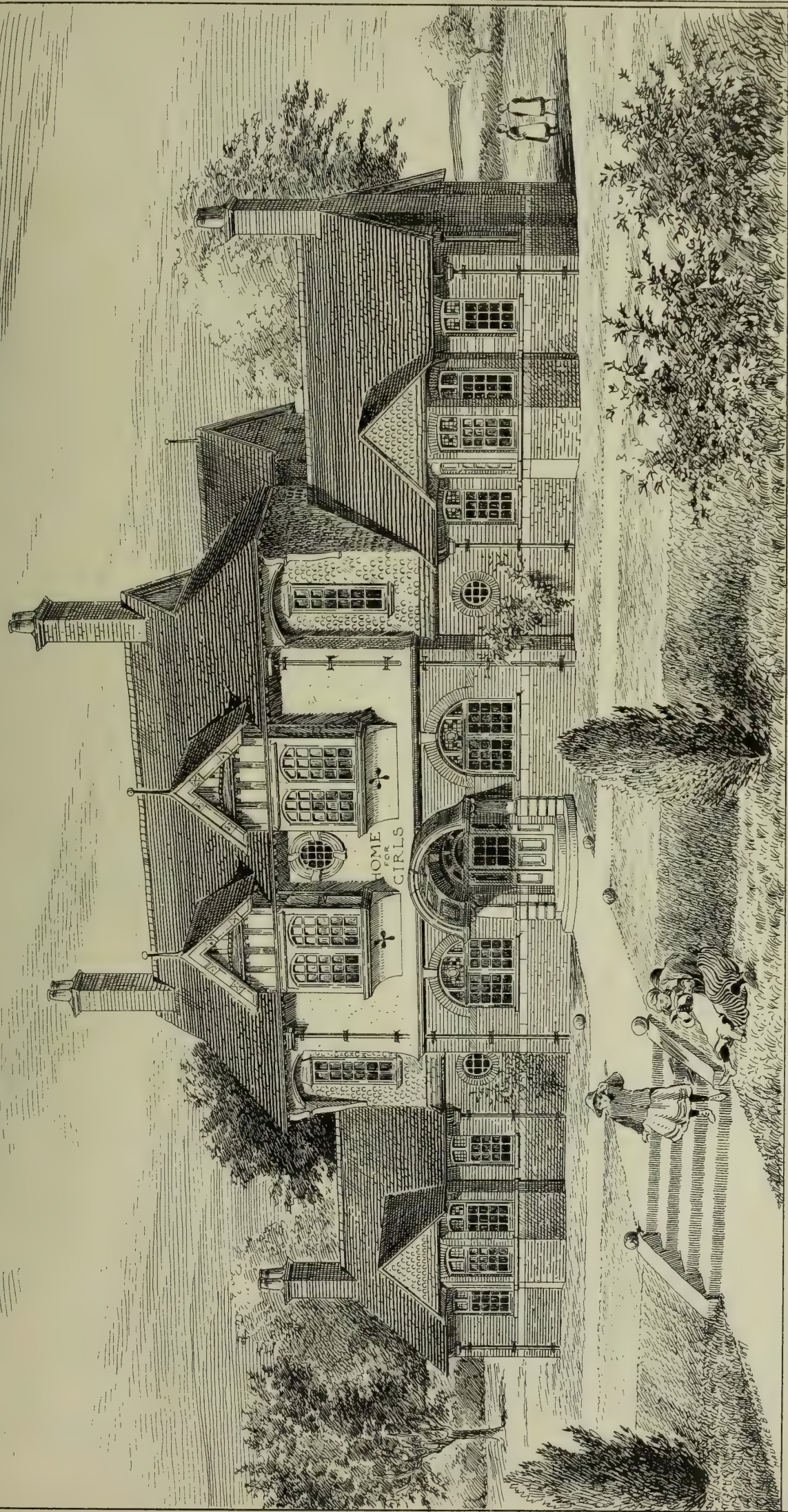
— SOUTH — ELEVATION —







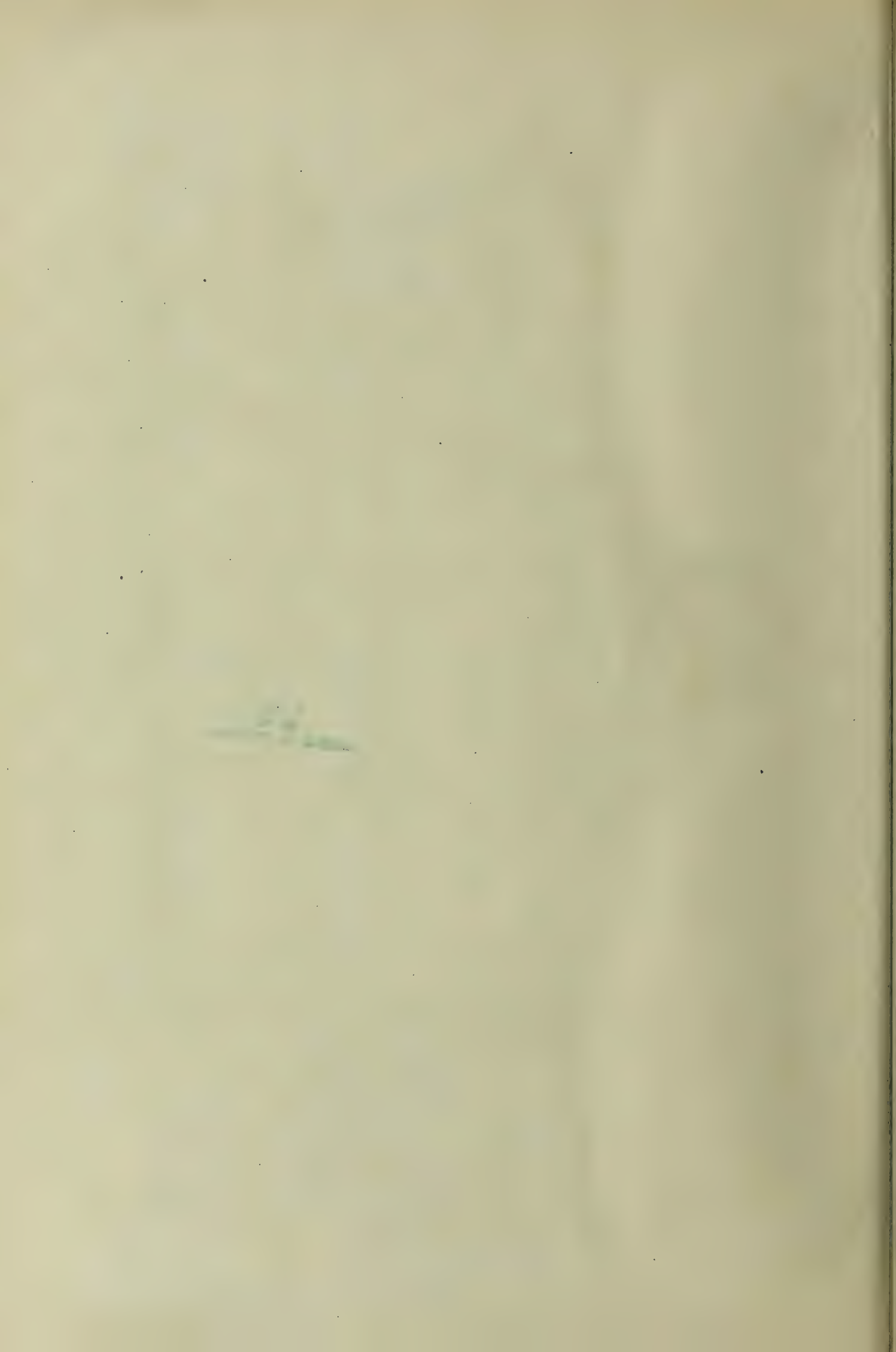




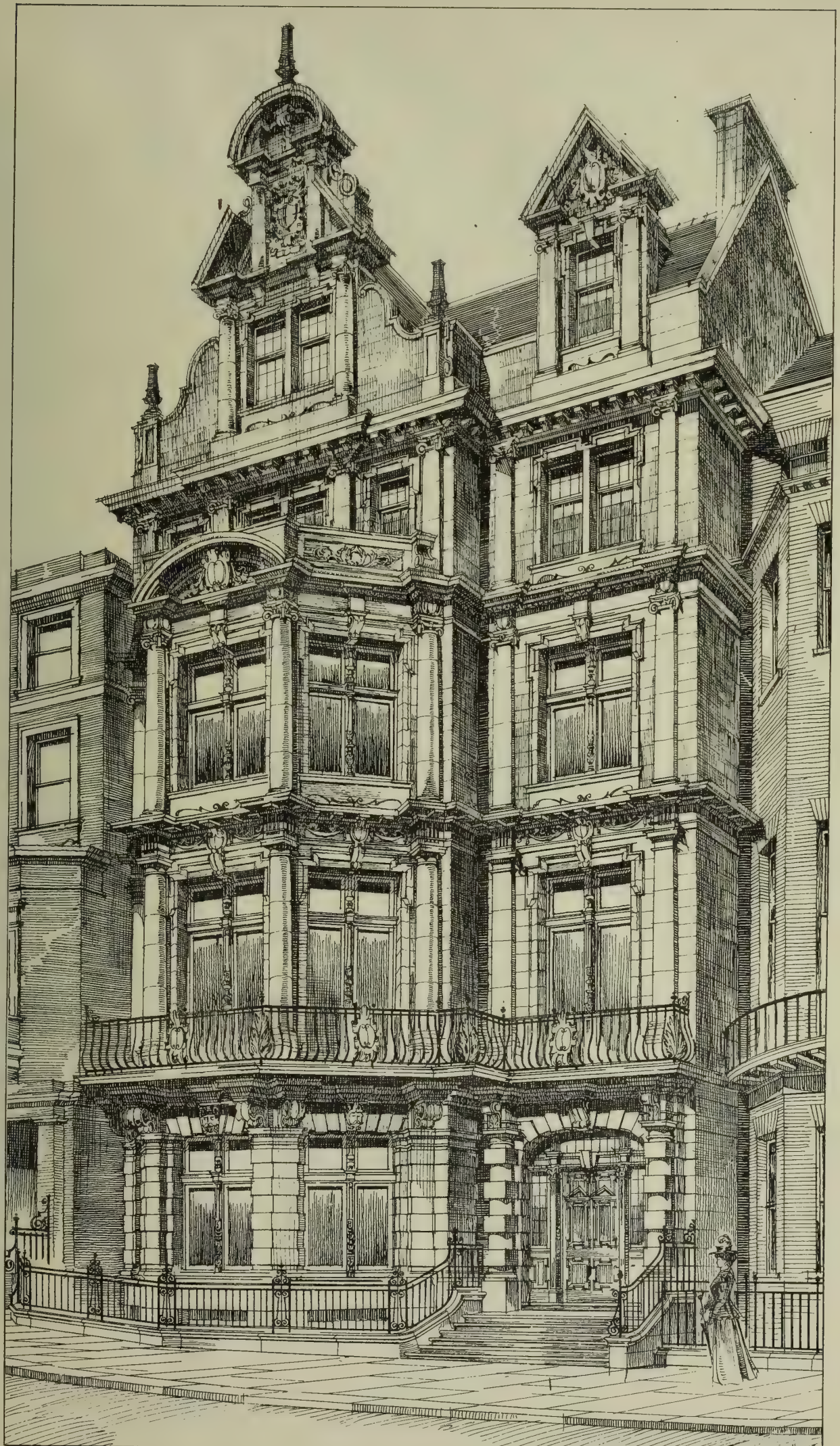
PASSMORE EDWARDS' HOME FOR GIRLS CHALFONT ST PETER'S BUCKS FOR THE NATIONAL SOCIETY FOR THE EMPLOYMENT OF EPILEPTICS  
MAURICE B. ADAMS F.R.I.B.A., ARCHITECT.

Photo Lithographed & Printed by James Alderman 6 Queen's Square W.









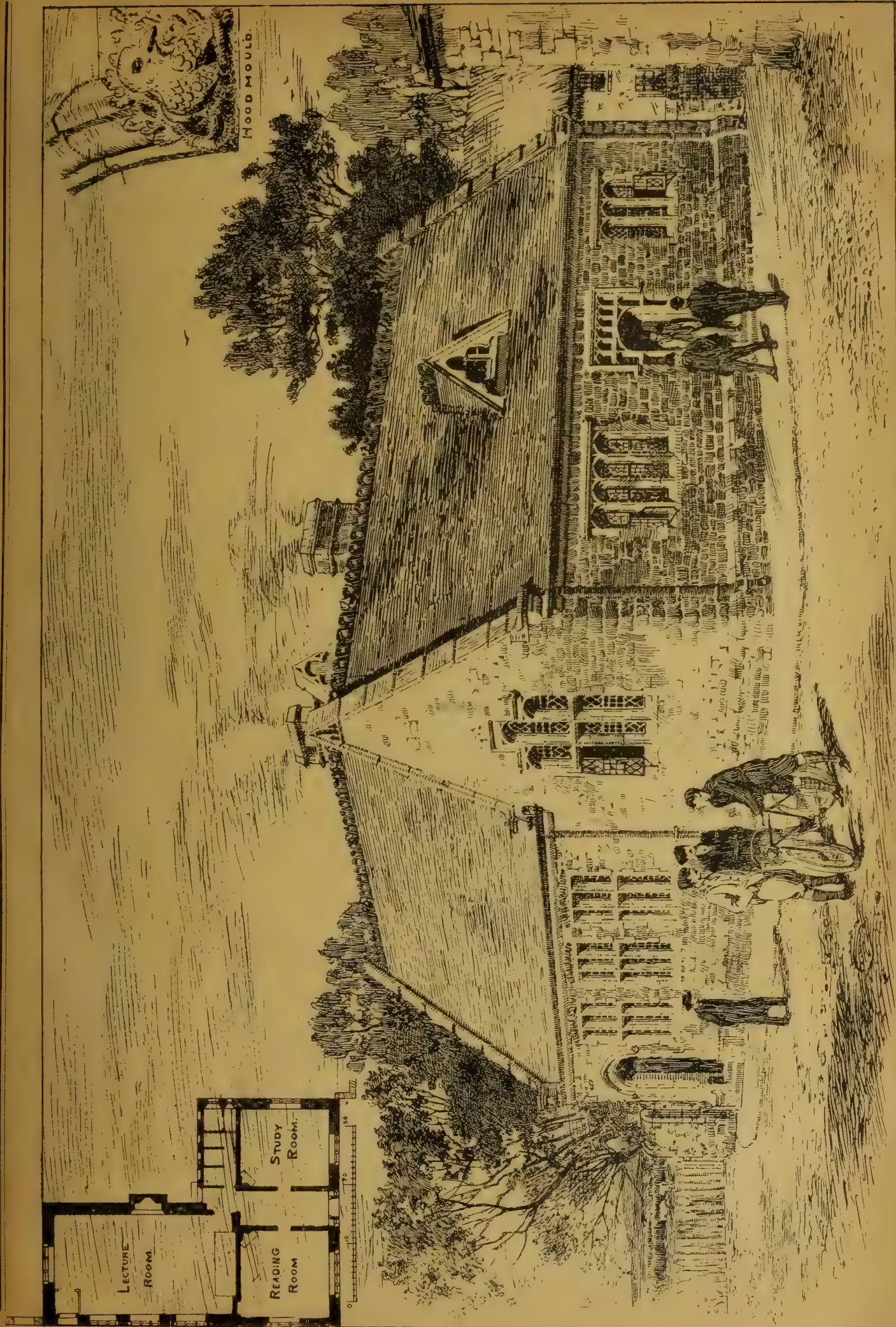
NO 18 PARK LANE W. GEORGE LETHBRIDGE ARCHA-ARCHT

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.









THE YOUNG MEN'S INSTITUTE, COWBRIDGE, GLAMORGANSHIRE, —ROBERT WILLIAMS, F.R.I.B.A.,—*Architect.*



# ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**THE EDINBURGH ARCHITECTURAL ASSOCIATION.**—The Edinburgh Architectural Association, on the occasion of its annual excursion, on Saturday, visited Linlithgow. Mr. Thomas Ross, president of the Association, conducted the party over the Palace in the unavoidable absence of Mr. W. W. Robertson, and described the plan and the manner and periods of the erection and drew attention to the means which have been taken by Her Majesty's Board of Works to preserve the building from further decay. Mr. John Honeyman, R.S.A., architect for the restoration of St. Michael's Church, described the condition of the church before the work of restoration was begun, pointed out what had been done, and showed on drawings the proposed additional work. Dr. Rowand Anderson moved a vote of thanks to Mr. Honeyman for the interesting description of the restoration of St. Michael's Church, and expressed the appreciation of the members of the association for the manner in which the work had been carried out. Mr. W. Horn Henderson, Linlithgow, moved a vote of thanks to Mr. Ross for his explanatory description of the Palace, and, Mr. Honeyman and Mr. Ross having replied, the president said it would be an unpardonable omission if the Association allowed this visit to the royal and ancient burgh, so long and intimately connected with the kings and queens of Scotland, to pass without one toast—that of Her Majesty the Queen. The toast having been duly honoured, the party drove to Bonhard House and Kinneil House, which were carefully examined under the leadership of Mr. Ross, who drew attention to the fine plaster ceilings at the former, and described the erection of the latter as two houses joined together by wings in the reign of Charles II. An examination was also made of ruins of a chapel at Kinneil, which is being carefully cleared—under the direction of Mr. Macaulay, factor for the Duke of Hamilton—of the rubbish which has accumulated over the foundations.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—Members are specially urged to join the annual excursion to Bamburgh, on July 3. The party will assemble at the Central Station, Newcastle, and travel by the 9.30 a.m. express train to Belford. Members are requested to take their own tickets, single fare (4s. 3½d.) for the return journey (upon producing their membership pass, or by taking week-end tickets). Lunch and dinner, and seats in conveyances to and from Bamburgh, will be ordered for those only who send in their names to the hon. sec., to 13, Grey-street, Newcastle, by not later than 11 a.m. on June 26. Should any gentleman send in his name, and be unavoidably prevented from joining the party on July 3, he will be charged 7s. for lunch, dinner, and conveyances, as also will those attending the excursion. The return train for Newcastle leaves Belford at 8.29 p.m. express, arriving in Newcastle at 10.5 p.m.

**YORKSHIRE ARCHÆOLOGISTS AT RIPON.**—The members of the Yorkshire Archæological Society held their biennial excursion on Friday, when Markenfield Hall and Ripon Minster were visited by about 70 members and a large number of ladies. From the station the party drove direct to Markenfield, where they were received by the tenants, Mr. and Mrs. R. Foster, and at once proceeded to inspect the ancient banqueting hall. This, with one or two unimportant alterations, stands precisely as it did at the beginning of the 14th century. Indeed, Markenfield Hall is the finest example of a 13th or 14th century manor house in the northern counties. In the hall, the hon. secretary, Mr. William Brown, of Trenholme, Northallerton, gave a brief and interesting sketch of Markenfield and its owners. The earliest mention of the house appears to have been in Domesday Book. Not until early in the 13th century did it come into possession of the Markenfield family. In 1316 the then owner and founder of the family fortified it, digging around it the moat, which still remains. From this date until the reign of Queen Elizabeth, the owners seem to have lived peacefully at Markenfield, the eldest sons going up to Oxford, and returning to succeed uninterruptedly to the family estate. It appears, however, that trustees were not always unimpeachable, even in Mediaeval days. One for breach of trusteeship was actually excommunicated; he was imprudent enough to tamper with trust funds left by a churchman. A Markenfield was concerned in a rising against Queen Elizabeth, for which he was attainted, and

fled to France. On his death the attainder was reversed, and the old hall remained in the possession of his descendants until the last century, when it was bought by an ancestor of the present owner, Lord Grantley, who was Lord Chief Justice of the Common Pleas. The ancient chapel and the solar (or lord's retiring-room) were visited, and, despite the rain, many of the guests climbed the winding stairs leading to the roof, and peeped through the cross-bow embrasures at the surrounding country. The old buttery in the basement, which remains just the same as in 1300, was also worth a visit. During the stay at the Hall, Mr. C. C. Hodges, F.S.A., F.R.I.B.A., of Hexham, described the architectural features of the building. Ripon Minster was next visited, the society being received by the Dean (the Hon. W. H. Fremantle), who gave an interesting sketch of the building. Mr. Hodges described its architectural features, and the visitors then explored the Minster, inspected the mural tablets and effigies, the carving of the stalls of the canons, and admired the beautiful east and west windows. The Anglo-Saxon crypt, sole relic of the church built by St. Wilfrid, was inspected, being lit for the nonce by candles, that the narrow steps, worn by the feet of countless penitents, might not be responsible for any accidents. The Norman crypt, constructed, with the main body of the church, by Roger, the great building Archbishop of York (1154-1181), was likewise visited. After a stay of an hour and a half in the minster, a move was made to the chapel of the Hospital of St. Mary Magdalen. This building, which is now disused, is one of the most venerable in Ripon. It owes its erection to Thurstan, an Archbishop of York, and amongst the objects of interest may be mentioned a fine oak Perpendicular chancel-screen and an ancient plate-chest. With this visit ended the excursion to Ripon.

## CHIPS.

The foundation-stone of the new buildings for St. Boniface College at Warminster was laid on Thursday in last week. The buildings will be Jacobean in style; the first section now in hand will cost £3,000, and the entire scheme £10,000.

The town's improvement committee of the Hull Corporation have reported in favour of opening out better means of communication between Paragon Station and the Albert and Railway Docks by way of Mytton-street, which it is proposed to widen.

A monument is being erected to the memory of the third and last Lord de Tabley in the churchyard at Little Peover. It consists of a Runic cross, 20ft. in height, simply decorated. The monument stands in a piece of ground which was recently given by Lord de Tabley as an addition to the burial ground, and he is himself the first tenant.

Two memorial stained-glass windows have this week been placed in the parish church of Detling, near Maidstone. One of the lights in the south wall represents "The Child Jesus in the Temple," and the other, a single light in the tower, shows our Lord with little children at His knee. Both have been executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, W.

A new roof-garden pier, which has been built by the dock department of New York City at the foot of East Third-street, was opened formally on Saturday last, June 19. The pier is over 300ft. wide, and cost 54,000.

Colonel John Ord Hasted, R.E., one of the Local Government Board Inspectors, held an inquiry at the town hall, Wakefield, on Friday, with reference to an application by the West Riding County Council for power to borrow £53,370 for the new acute blocks to the West Riding Lunatic Asylum at Wakefield, and £43,500 for the completion, &c., of the new county offices, which are also being erected at Wakefield.

Major Marindin recently inspected certain portions of the tramways in the boroughs of Rochdale and Heywood, and the district council areas of Castleton, Whitworth, Wardle, and Littleborough, and has recommended to the Board of Trade that the license to use steam for traction may be renewed for the remainder of the term in which the Tramway Company have power to work the lines. That will be till 1902.

The rural district council have resolved not to offer any objection to the Ashbourn and Derby light railway scheme, which is estimated to cost £13,594, exclusive of rolling stock.

The town council of Brighton have approved an application being made to the Local Government Board for a provisional order granting the Brighton Intercepting and Outfall Sewers Board additional borrowing powers to the extent of £7,000.

## COMPETITIONS.

**GORLESTON-ON-SEA.**—In a recent limited competition the designs of Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, architects, of Norwich, were selected for a new hotel to be erected on a magnificent site on the top of the cliffs, commanding unique views of the harbour mouth, jetty to the east, and the coast line towards the south. Beneath the cliffs the outskirts of the site afford excellent sites for shops, baths, lavatories, &c. Some of the shops are now being erected by Mr. J. F. W. Bray, contractor, of Great Yarmouth, who has undertaken to complete his contract by the middle of July, ready for occupation this season. The hotel is to be completed in readiness for next season.

**NEW YORK.**—The Bill authorising the building of the new public library building for New York City has been approved by the Governor. The estimated cost of the building is £340,000 sterling, exclusive of the heating, lighting, ventilating apparatus, furniture, book stacks, shelves, and also for the expenditure for architects' fees and for removing the reservoir. In a pamphlet issued by the trustees of the New York Public Library, the various requirements of the building are specified. The library will stand on a lot 482ft. by 455ft. square. The building will measure about 225ft. by 350ft. It is to be fire-proof, and have a storage capacity for 4,000,000 volumes. The committee proposes to obtain plans by two consecutive competitions; an open competition for sketches only and restricted paid competition. Director J. S. Billings, Bernard R. Green, in charge at the Congressional Library, and Professor Ware, of Columbia University, will be the judges in the preliminary competition. All architects having offices within the limits of Greater New York are invited to compete in the preliminary competition. The committee will then choose from the work of these architects twelve sketches which, in their judgment, are the most meritorious. They will be given a premium of 400dol. The committee will then choose from the authors of the twelve sketches so selected certain of the competitors, not more than six in number, to take part in the second competition, selecting only those who, in their judgment, are qualified by their professional training and experience to undertake so important a work. The persons thus selected will then be invited to take part in a second competition, which will be conducted under such conditions as the committee may name. The competitors in the second competition will be given 800dol. as the estimated cost to them of the drawings required. These drawings will be judged by a jury of seven persons, consisting of three members of the board of trustees to be named by the board, the director, and three practising architects, who may be chosen by the committee. The jury will, by a majority, select the designs, at least three in number, which they find, on the whole, to be the best, and will send them to the trustees, naming them in the order of their merit, with such criticisms as they see fit to make. The trustees will then send these to the Board of Estimate and Apportionment for its approval, subject to such changes as may afterwards be deemed advisable, and the trustees will recommend the author of the best plans as the architect of the building. The trustees may also appoint an engineer to superintend the work. Plans are now being perfected by Dr. Billings to systematise the three large collections with a view to their amalgamation in their new home. It will be at least three years, possibly more, before the collections can be housed under the same roof. It will take a large part of this time to go over the libraries thoroughly, classifying their treasures, and have them put in proper shape for the final fusion. Already the collections are being consolidated.

At the Guildhall, Walsall, on the 17th inst., Mr. Rienzi Walton, on behalf of the Local Government Board, conducted an inquiry touching an application on the part of the corporation for sanction to a loan of £6,000 for the purchase of land in Lichfield-street, as the site of municipal buildings.

The Corporation of Chester have purchased for £4,060 Beech House and 20 acres 1 rood 7 poles adjoining the sewage works, and extending from the river cop to Bumper's-lane, in view of the anticipated necessity for extension of the sewage works, and especially for additional subsidence tanks and filtering-room now becoming pressing.



## Intercommunication.

### QUESTIONS.

[11690].—**Tile-Hung Houses.**—Will anyone who has erected a house with tile-hung upper story give particulars as to hanging, and finish against window openings, and also the lower course over brick wall?—**INEXPERIENCED.**

[11691].—**Ornamental Plasterwork.**—Is there any treatise on the subject of interior plastering of an ornamental kind; and if so, where can it be obtained?—**A STUDENT.**

[11692].—**Architect's Responsibility.**—What is the actual extent to which an architect may be held responsible for any defects that may appear in any building carried out under his superintendence? Has the extent of his responsibility ever been legally defined? What legal decisions have been recorded in that direction? Some clients seem to think that an architect should give their work closer attention than even a clerk of works could possibly do, and that he is responsible for every nail driven and every brick laid. If, in order to finish plasterwork rapidly, during the architect's absence for a couple of days the contractor leaves all the windows open on the hottest summer day with a wind driving through the entire building, and gets the first coat perfectly dry in about 24 hours, some months after a portion of the plaster ceiling comes down the rapid drying having taken the nature out of the plaster, is the architect responsible for this, or for a pipe having come loose for want of an extra holdfast? To me it seems preposterous.—**JUSTICE.**

[11693].—**Party-Walls.**—I believe there are four descriptions of party-walls. Would any reader kindly describe their differences, and what privileges they carry to either owner as to interferences?—**H. E.**

### REPLIES.

[11687].—**Waterproof Glue.**—If 10 per cent. (about) of potassium bichromate is added to ordinary glue, it will, on being exposed to sunlight, become insoluble, and therefore waterproof.—**D. W. GAWN, Wealdstone.**

[11687].—**Waterproof Glue.**—Try ordinary glue with the addition of 5 per cent. of bichromate of potash, and apply in fine weather.—**R. GILL.**

[11688].—**Damp.**—"L. D." has a house, the front wall of which is damp. He says it is built of stone, has lime plaster, and brick dressings to windows, &c. I should recommend "L. D." to apply Szerelme's stone solution to the front wall. Send for particulars of the solution to the firm, Rotherhithe. I do not think creepers would obviate the mischief; they are generally credited with causing moisture, whatever little they may abstract. The very shade they afford to the walls from the sun would prevent any evaporation of moisture from the wall. The chief natural mode of drying is the sun, which draws the moisture outwards. If the dampness cannot be abstracted by this means, the fires inside the house draw it inwards, and in winter weather the interior is affected by damp.—**ANTI-DAMP.**

[11688].—**Damp Walls.**—The application of three coats of Szerelme's stone liquid, which is a transparent solution, to the outside wall will effectually prevent the penetration of damp. See advt. in the issue of this journal for the 18th June, page XVI.—**W. J. B.**

[11688].—**Damp.**—The external walls of houses are comparatively seldom built with requisite care, and an old enemy, damp, speedily attacks us. The basement story should be isolated from the surrounding ground by an open space, and, in order to prevent the admission of underground damp, a thin outer wall should be built, reaching the ground level, and leaving a space between it and the main wall. Walls should be built double, with an interspace, strengthened occasionally by cross-ties of bricks. This will prevent, to a great extent, the bad results that follow from a driving rain, but it is always well to cover the outer walls with plaster or slate.—**WOODPECKER.**

Mr. G. T. Lynam, C.E., assistant burgh surveyor, Aberdeen, has been appointed engineer and surveyor to the Corporation of Burton-on-Trent. Mr. Lynam has been in the service of Aberdeen Corporation for four and a half years.

An International Congress of Architects will be commenced in connection with the Universal Exhibition, to be held this year at Brussels, and all architects of the world are invited to participate. The Congress is to be in charge of the Société Centrale d'Architecture of Belgium, which is already renowned for its activity in professional matters, and is likely to be very interesting and useful. The meetings of the Congress will be held every day from August 28 to September 2.

A subscription portrait of Earl Beauchamp by Mr. Walter Urwick was on Friday presented to the city of Worcester to be hung in the Guildhall as a recognition of his lordship's mayoralty, which expired in November last.

The unprecedented magnificence of the Wallace bequest is shown by the fact that, on being valued by Mr. Woods, it is found to be worth four millions. If the Government agrees with what is understood to be the opinion of the committee, that the collection should be kept where it is, it is estimated that the cost of acquiring and repairing Hertford House will amount to £12,000.

It is intended to erect a new church at Pentre, near Flint, on a site given by Mr. J. K. Huntly, of Highfield Hall. This will be the fifth church in the parish of Flint.

### LEGAL INTELLIGENCE.

**CURIOUS ACTION AGAINST A BUILDER.**—In the Small Debt Court at Elgin on Friday—Sheriff Rampini on the bench—proof was led in an action at the instance of Sir William Gordon-Cumming, Altyre, against James Macdonald, builder, Inverness, for repayment of a sum of money alleged to have been paid to the defender in error in connection with building operations at Altyre. It appeared that the defender had the contract for the alterations that were made at Altyre House a few years ago. In addition to the ordinary contract work there was scheduled work to be paid for at a fixed rate according to measurement. In this latter class of work there was included three longitudinal walls and one cross wall. The defender alleged that he erected the three walls, but the pursuer led proof to show that the defender did not erect the cross wall, and that it was done by the late Mr. Murray. The architects, Messrs. Reid and Wittet, Elgin, certified, however, to the measurements and to the payment of the account for the cross wall to the defender. Mr. Wittet, who was examined, stated that they discovered afterwards that this money had been paid in mistake. The defender maintained that he had not been paid for any work that he had not executed. The Sheriff held that in law the wrong party had been cited. The architects should have been sued in the first instance, and if the case had gone against them they in turn might have had recourse against the defender. The Sheriff accordingly assailed the defender.

**TORQUAY ARBITRATION CASE.**—Mr. H. J. Snell, architect, of Plymouth, made known his award on Friday in the arbitration case of "Pike v. Cook," heard at the Torquay Town Hall, on April 1. Plaintiff was Councillor E. Pike, builder, of Lyn-on-Torquay, and the defendant, Miss Louisa Cook, a maiden lady, residing at Daleth, Torquay. Plaintiff claimed £320 2s. 6d., balance due on a sum of £470 2s., for work done and materials supplied at Daleth in accordance with defendant's instructions. The case was part-heard in the Queen's Bench Division, and was remitted to Mr. Snell for arbitration, the proceedings under which were reported in our issue of April 9 last (p. 545). Defendant objected to the prices charged as not being fair and reasonable, and stated that she did not order certain specific items. It was also contended that the plaintiff did much unnecessary and useless work, and further that the work was negligently and imperfectly done. In addition it was asserted that extra work was required, costing £150. Whilst denying liability, defendant paid £75 into Court in satisfaction, and counterclaimed for £175 for damages due to plaintiff's negligence. At the hearing of the arbitration, Mr. J. Hutchings, Teignmouth, appeared for the plaintiff, and Mr. Douglas Metcalfe, barrister, instructed by Mr. A. W. Cowdell, Torquay, appeared for the defendant. After a very lengthy hearing, in which the laying of certain floors in wood blocks necessitated the calling of considerable expert evidence, the arbitrator reserved his award, which he made known yesterday. Plaintiff was awarded £213 8s. 6d., including the £75 paid into Court, the parties to pay their own costs and one moiety of the costs of arbitration. Nothing was allowed on the counterclaim.

**THE USAGE OF ABERDEEN BUILDING TRADE.**—In the Scottish Court of Session on Friday, the judges of the First Division disposed of an appeal from the Sheriff Court of Aberdeen, in an action at the instance of Mrs. Ellen Carr or Murray, wife of John Murray, builder, 89, Union-grove, Aberdeen, against Rennie and Angus, masons, 150, Hutcheon-street there. The object of the action was to obtain implement of a contract which pursuer said defenders had entered into to execute the mason work of dwelling houses in Hargate, Aberdeen, and also to recover £25 as damages. The defence was that the offer was lodged on the 10th June and was not accepted till 21st, and that by the conditions of the architects in Edinburgh, which formed a condition of the contract, acceptance should be intimated within seven days of the date of lodging of the offer. As pursuer had not done so, nor accepted within reasonable time, defenders had considered that their offer was declined. The pursuer pleaded that as there was no definite date for acceptance mentioned in the offer, a contract had been formed by the acceptance. When the action was raised an arrangement was made that the work should be carried out under the next offer. The sheriff-substitute (Mr. D. Robertson) held that the offer was made in reliance on the usage of the building trade in Aberdeen, and the defenders were entitled to assume that pursuer knew of the usage. His lordship accordingly assailed the defender with expenses. On appeal, Sheriff Crawford affirmed this, and the pursuer appealed, and counsel were heard recently. The Lord President said the offer upon which the action was founded was to build a house for £690. No time was specified in the offer as limiting the period of its subsistence. It was accepted within eleven days. The sheriffs had held that the offer was binding for seven days and no longer. The judgments of both sheriffs were

founded on certain printed conditions not expressly referred to either in the offer or the acceptance. What they held to express was a usage or custom of the building trade in Aberdeen to the effect that offers by builders were only binding for seven days. Both sheriffs held that the defenders' offer was made in the knowledge of and in reliance on these conditions, and that they were entitled to assume that the conditions were also in the knowledge of the pursuer or her architects, to whom the offer was sent in. The sheriff held also that the pursuer was bound to accept within a reasonable time, and that on the question what was a reasonable time there could be no evidence better or so good as the usage of trade as fixed by the conditions. In the present case the pursuer was not committed to any date as that at which the time for offering was over. The pursuer was entitled to have her offers all in before she began to consider them; she was entitled to assume that they would not come in simultaneously, and in fact they came dropping in for several days. The same considerations showed also no evidence at all that the time taken in the present case was unduly or unreasonably long. He was for recalling the interlocutors appealed against, and finding in fact that the offer was accepted and had not been withdrawn before acceptance, and that it was accepted without unreasonable delay; and, in law, that it was binding. As the pursuer's claim was necessarily for damages, they had to consider how much was proved; and he was unable to find evidence of more loss than the difference between the two contracts. For that sum, which he believed was £11 10s., the pursuer was entitled to decree. Lord Adam and Lord Kinnear concurred, and judgment was given accordingly; and defenders were found liable in expenses in both the Sheriff Court and the Court of Session.

**IN RE H. C. CARTER, BIRMINGHAM.**—A meeting of the creditors of H. C. Carter, formerly carrying on business as a builder, was held at the Grand Hotel, Birmingham, on Friday, for the purpose of considering, amongst other matters, a large claim made against the estate by Mr. George Cadbury. The trustee and committee of inspection appointed at a previous meeting under a deed of assignment declined to admit the claim until the creditors as a whole had had an opportunity of expressing their opinion upon it. Mr. Sharp explained that the claim was in respect of building contracts entered into by the debtor for the erection of houses on Mr. Cadbury's estate at Bournville. The debtor had received £3,050, at the rate of 80 per cent. of the work done, and he expected to receive £762 10s., being the remaining 20 per cent. He had, in addition, materials on the ground estimated to be worth £400. Instead of any sum being paid over, a claim was now made by Mr. Cadbury against the estate for £1,049 1s. 11d. for loss on completion of contracts. The estate had realised £1,259, which, excluding the claim in question, would pay a dividend of 8s. 6d. in the pound. If the claim were admitted the dividend would be 5s. 11d. The chairman, Mr. E. Tailby, enumerated the items of Mr. Cadbury's bill, pointing out that though the debtor's estimate of the amount required to finish the houses was (deducting £400 for the material on the ground) only £880, Mr. Cadbury charged £2,600 for the work. Mr. Cadbury's bill came out at £636 per pair of houses, whereas the debtor's contract was £450 per pair for about half of them, £530 for some others, and £550 for the remainder. The debtor said work had been done which was never in his specifications. Eventually a deputation was appointed to wait upon Mr. Cadbury, and endeavour to come to a satisfactory arrangement. Failing this, it was decided to ask Mr. Cadbury to consent to the matter being referred to Mr. Isaac Bradley as arbitrator.

**EX-PARTE THE LONDON COUNTY COUNCIL.**—**ERECTION OF WOODEN STRUCTURES WITHOUT LICENSE.**—In the Queen's Bench Division on Friday before Mr. Justice Hawkins and Mr. Justice Bruce, Mr. H. race Avory moved on behalf of the London County Council for a rule to call upon a magistrate sitting at Worship-street Police-court, to show cause why he should hear and determine an application for a summons, and proceed to dispose of the matter according to law. He did not, he said, seek in any way to interfere with the discretion of the magistrate in determining the case, but he contended that the magistrate had taken a wrong view of the construction to be placed upon a statute. The magistrate had indeed himself suggested that there should be an application for a case to be stated for the opinion of their lordships. The County Council had recently discovered that a man had set up a wooden structure in a street without having any license for them under the Metropolitan Local Management Act of 1882, and they therefore applied for a summons against the man, but the magistrate refused to grant the summons, because he thought that the Act of 1882 was repealed by the Building Act of 1894, sec. 215. It was submitted to their lordships that the Act of 1894 preserved to the Council their powers to proceed under the Act of 1882 for offences committed against provisions in that statute. Mr. Justice Hawkins, after some



argument, said that the learned counsel might take a rule; but at the same time this must not be taken as an expression of their opinion in his favour. They only granted the rule because they thought that it was a matter of sufficient importance to be discussed and determined. Mr. Avory: The point had been raised before another magistrate, and was decided by him in the opposite way. Rule granted.

### CHIPS.

There is a large demand at the present moment for firebricks, for the manufacture of coke ovens in the Crimea and other parts of Southern Russia. Thousands of tons have been shipped from Grange-mouth, and brickmakers in the vicinity are now very busy executing further orders.

Eighteen sets of plans of buildings were submitted to the Plans Committee of the Town Council of Aberdeen on Friday. The plans were principally for dwelling-houses and warehouses, and the estimated cost of the property is £26,000.

A German engineer has secured the exclusive right to utilise the Danube cataracts for the production of power. Arrangements are contemplated for developing 6,000 H.P. on the Servian Danube and 15,000 H.P. at the Iron Gates.

The members of the Society of Engineers visited the works of the London section of the Manchester, Sheffield, and Lincolnshire extension to London on Thursday in last week. The forward state of the work and its bold, massive, and comprehensive treatment excited loud praise. Special attention was paid to the tunnelling and to the great works in connection with the terminal station and the palatial hotel which the company is erecting there.

Ten almshouses for aged couples, in connection with the Grimsby Almshouses Trust, were formally opened on Friday, and the inmates given possession. The houses have been built on land given by Mr. Grant Thorold, at a cost of about £70 each. A number of others have previously been erected, while six more are being built for widows with families.

A Local Government Board inquiry was held by Mr. W. O. E. Meade-King, M.I.C.E., at the Assembly Rooms, Winscombe, on June 17, in consequence of the Axbridge Rural District Council having applied for sanction to borrow £2,400 for works of water supply for the parish of Winscombe. Mr. W. Reece (clerk to the Axbridge Rural District Council) and Mr. A. Powell (engineer to the scheme) explained the proposals.

At the meeting of the Devon County Council, Exeter, on Friday, they had before them the election of two surveyors for the county. In response to advertisement there were 163 applications. The committee recommended three to the council for selection—Messrs. Acock and Masterton, old officials, and Mr. Ingram, Bridgwater, a new candidate. Mr. Beswick, of Exmouth, was also nominated by Sir John Phear. The voting was as follows:—Acock, 48; Masterton, 48; Ingram, 39; Beswick, 4. The two former were therefore elected.

To consider an application of the Leeds Corporation for permission to borrow £62,300 for paving the streets of the city, Colonel John Ord Halstead, R.E., held an inquiry on behalf of the Local Government Board at the town hall on the 17th inst. The town clerk (Mr. J. Harrison), the city engineer (Mr. T. Hewson), the city accountant (Mr. W. Derry), and Mr. T. A. Prince (highways surveyor) explained the proposals.

The Mercers' Company have accepted with thanks an offer of Mr. Howley Palmer to bear the cost of erecting in the Mercers' School Grounds a statue of the founder, Dean Colet, to be executed by Mr. Hamo Thornycroft, R.A.

The sales of the Royal Academy and other exhibitions this year have not shown any improvement in the state of the picture market, and purchases have chiefly been made of cabinet works at small prices.

New board schools, built from the designs and under the superintendence of Messrs. Grierson and Bellis, architects, Llanrwst, were opened on Tuesday. The schools, with master's house, are grouped in three detached blocks, the boys' and girls' departments each to accommodate 180, and the infant school to accommodate 150. The materials used are Cae Coch stone for facings, with Cefn stone dressings, the roofs being covered with Penmachno grey slates. The cost of the buildings, including master's house, clock-tower, boundary walls, gates, railing, &c., is close on £6,000. The clerk of works was Mr. Robert Parry, of Bettws-y-Coed, the contractors being Messrs. Williams and Son, Carnarvon.

On Thursday in last week, a Local Government inquiry was held by Mr. R. H. Bicknell, at Middlesbrough, respecting an application on the part of the Middlesbrough Town Council to borrow £2,500 for alterations and additions to the public baths in that town.

### STATUES, MEMORIALS, &c.

**PADDINGTON GREEN.**—The Siddons Memorial, unveiled by Sir Henry Irving, on Monday, consists of a statue of Mrs. Siddons as "Tragedy," sitting in a Greek chair, similar to the famous marble ones in the "Cavea" of the Theatre of Dionysus, on the slopes of the Acropolis of Athens. The marble selected, one of the hardest and most durable known, is from the quarries of Mont Altissimo, in the Carrara range of mountains. The statue is out of a solid block, and is placed on a boldly-moulded pedestal of Portland stone, on a raised platform of the same material. The work has been executed by Messrs. Farmer and Brindley, of Westminster Bridge-road. The suggestion for the statue was made by Mr. Brindley, and modelled under his direction by the firm's artist, Mr. L. Chavalliaud, to whom the premium was awarded by Lord Leighton in open competition.

**PHILADELPHIA.**—The new Washington monument, erected at the Green-street entrance of Fairmount Park, Philadelphia, was unveiled on May 15 by President McKinley. The statue is one of the largest monuments ever erected in the United States, and has cost over £50,000 sterling. The design was made by the German sculptor Rudolph Siemering, and represents an equestrian statue of George Washington on a pedestal of bronze, placed on a granite platform. The figures and ornaments are all in bronze, and the monument as it stands is 44ft. high. The base of the monument is oblong in shape, 61ft. by 74ft., and is built of pink Swedish granite, having thirteen steps, symbolical of the thirteen original States. At the corners are fountains representing four great American rivers, the Delaware, Hudson, Potomac, and Mississippi, with allegorical figures of Indians. These fountains are guarded on either side by native animals, all in bronze. From the platform rises a granite and bronze pedestal some 17ft. high, upon which is a bronze equestrian statue of General Washington in the uniform of the Revolutionary Army. A large military cloak is thrown over his shoulders, falling well over the horse. At the front of the pedestal is an allegorical group representing America, seated, holding a trident and cornucopia. On either side is a figure, one holding a scroll, the other offering a wreath; below is an American eagle supporting the arms of the United States. The group at the back is America showing her sons their condition of slavery, and urging them to go forth and seek freedom and independence. Beneath this group are the arms of Pennsylvania. Bronze bas-reliefs are on either side of the pedestals, one representing the march of an army and the other that of a west-bound emigrant train.

On Saturday the Bishop of London laid the foundation-stone of the new parish church of Emmanuel, West-end, Hampstead, in the presence of a very large gathering.

Colonel W. R. Slack, C.E., one of the inspectors to the Local Government Board, conducted an inquiry at the Union Workhouse, Brixworth, on Tuesday week, to consider the application of the Brixworth Rural District Council to borrow £600 in order to take up and relay the sewer of the village. Mr. A. Lewis, surveyor and sanitary inspector to the Brixworth Council, said that parts of the sewer had been already relaid, and explained to the inspector the work now proposed to be done. The village was built on a subsoil of ironstone shale, and there were about 240 houses. The joints of the sewer consisted entirely of clay, and were laid in 1877.

Colonel More, M.I.C.E., an inspector of the Local Government Board, attended at the Board Schools, Irthlingborough, on Thursday in last week, to inquire into an application by the Wellingborough Rural District Council for sanction to a loan of £5,000 for works of sewerage and sewage disposal for that parish. Mr. Ives, C.E., whose scheme has been adopted by the rural authority, explained the plans and proposals.

On Thursday afternoon in last week, the foundation stone of the proposed new hall for the parish of St. Ambrose, Widnes, was laid by the Bishop of Liverpool, in the presence of a goodly company. The building, which is to be in Gothic style, will provide accommodation for 600 scholars, and is estimated to cost £2,400.

The ceremony of cutting the first sod of the new cemetery at Ryhope was performed on Thursday in last week. The total cost of the ground is £1,300, and the contract for completing the work is £3,845, which includes the laying of a sewer from the cemetery to join the council's main sewer at the foot of Burdon-lane.

On Saturday afternoon Messrs. Christie, Manson, and Woods sold at their rooms, King-street, St. James's-square, the collection of modern pictures belonging to the late Mr. J. L. Leathart, Gateshead-on-Tyne, and the late Sir Henry Edwards, of Berkeley-square, W. Some excellent prices were realised, the total being about £7,000.

### WATER SUPPLY AND SANITARY MATTERS.

**BARNSELY.**—The first sod of the new waterworks at Midhope for the Barnsley Corporation was cut on Thursday in last week by the mayor. There are now some 70,000 people dependent upon the Barnsley water supply, and under the new Act 30,000 more, who cannot obtain water elsewhere, are brought within the area of supply. The Ingbirchworth Reservoir may give a maximum supply of 1,250,000 gallons per day, the new reservoir will give 1,600,000 gallons per day. It is estimated to cost £170,000 to complete the works.

**SUNDERLAND.**—At the last meeting of the Sunderland Town Council, the health committee recommended that amended drawings for workmen's dwellings in the Hat Case area be adopted, and that, subject to the approval of the Local Government Board, the architects be instructed to prepare working drawings, and that the committee be authorised to arrange to have the quantities taken and obtain tenders. The Hat Case area is a district which was fixed on by the council some three years ago as an unsanitary area which should be dealt with under the Housing of the Working Classes Act. The houses on it have been demolished, displacing about 480 people. Alderman Harrison, in submitting the report, showed that the scheme provided for the housing of 454 people, but wide streets would be run through the area. There would be three blocks of buildings, one containing 60 two-roomed tenements, to let at 3s. 6d. a week, a second containing 24 three-roomed tenements, to let at 4s. 3d. a week, and 12 one-roomed tenements, to let at 2s. a week; and the third, containing 11 two-roomed tenements, to let at 3s. 6d. a week, and one one-roomed tenement, to let at 2s. a week. Thus the total rentals will amount to £978 18s. per annum. The value of the land to be utilised for the buildings is £1,202, and the estimated cost of buildings is £15,200. The interest and sinking fund for 40 years is estimated at £653 5s. 3d. a year, and the outgoings on the property is put at £137 1s.; rates and taxes at £195 15s. 6d., to which £23 4s. is added in respect of additional rateable value. These figures show a net annual profit of £16 0s. 3d. In the discussion which followed the scheme was warmly approved, and the recommendations of the committee almost unanimously adopted.

Canon Gore, who presided on Thursday in last week at a conference on "Church Building: Present and Future," held in the Jerusalem Chamber, Dean's Yard, Westminster, lamented the fact that, although there was a great deal of decoration in the churches of the present day, it did not stir the mind of the beholder, and there was the least possible element of individuality about it. The reason was that when people wanted to have their churches decorated, there were certain firms which occurred to their minds, and the transaction was thoroughly businesslike. It was left to great institutions like St. Paul's Cathedral to employ an artist, and to give him scope for the exercise of his personal gifts.

A workmen's cottages company has been formed, with a capital of £50,000, to carry on business as house and estate agents, contractors, and builders. The offices are at 65, Station-street, Nottingham.

The new Intermediate Girls' School, Abergavenny, is being warmed and ventilated throughout by means of Shorland's patent Manchester grates and patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Lord Provost's Committee of the Edinburgh Town-hall, who have in hand the choice of a site for the Usher Town-hall, have now narrowed their choice to two sites—those of the Canal Basin and in Charlotte-square. The former is said to meet with most favour among members of the committee.

On Saturday there was a large attendance at the funeral at Llandudno of Mr. Richard Hughes, Madoc-street, who was in his 83rd year. The deceased was for years actively engaged in the development of Llandudno, and last summer there appeared an interesting letter in our columns on his early experiments in laying out the site of the town. He made the Marine Drive round the Orme, and was contractor for numerous public works in the town and district. Mr. Hughes had been a member of the Welsh Baptist Church for 60 years, was a deacon, and treasurer of the church. The funeral took place at St. Tudno's, the Rev. D. Davies, his pastor, officiating.

A Local Government Board inquiry was held at Tonbridge on Friday by Mr. W. Willcocks, M.I.C.E., relative to an application by the urban district council for leave to borrow £4,808 for works of sewerage, which had been largely rendered necessary by the rapid growth of the town during the last three years. It was stated by the clerk that nearly 250 houses had been erected during that time, besides a printing works employing 200 hands and two cricket-ball factories, and the population was now estimated at 11,000.



## Our Office Table.

AMONG the Jubilee knighthoods announced are those of Mr. Jehn Taylor, C.B., F.R.I.B.A., who has been Surveyor of Palaces and Public Buildings in London since 1866, and who is promoted to K.C.B.; Mr. T. Wyke Bayliss, president of the Royal Society of British Artists, and hon. associate of the Society of Architects, the well-known painter of the interiors of Continental cathedrals, and writer and lecturer on art subjects; Professor William Blake Richmond, R.A., whose work of mosaic decoration in the choir of St. Paul's is approaching completion, the son of the late George Richmond, R.A., the portrait painter; and Mr. Alexander Richardson Binnie, M.Inst.C.E., the chief engineer to the London County Council. Mr. Binnie, who was born in London in 1839, entered in 1868 the Public Works Department of India, and afterwards designed and constructed the works for the supply of the city of Najpur with water. Subsequently, for fifteen years he was engineer to the Bradford Corporation, during which period he designed and carried out an extensive system of waterworks. Seven years ago he received his present appointment under the London County Council. Mr. John Wolfe Barry, the designer of the Tower Bridge and youngest son of the late Sir Charles Barry, has been promoted from C.B. to K.C.B., and the Hon. Reginald Baliol Brett, the secretary to H.M. Office of Works, receives a C.B.-ship.

THE Jubilee erections and stands are being speedily demolished. The hammer and axe are heard throughout the route, as if the promoters and owners of stands had not been fully patronised as they expected to be, and that the quicker the normal state of things were restored the better. One stage is reported to have collapsed in Southwark, but the ordinary croaker was rather disappointed in his denunciations. The fact is the L.C.C. did their best to hold themselves harmless from blame, and rather over-estimated than otherwise the conditions of safety. As specimens of carpentry many of the stands put up were nothing to boast of.

By permission of Mrs. Sutherland Orr and Mrs. Matthews, a meeting was held at the house of the late Lord Leighton, No. 2, Holland Park-road, on Wednesday in last week, Mr. Lionel Cust, director of the National Portrait Gallery, presiding. The meeting had been convened in order that the delegates who had been appointed by the vestry of Kensington, the Library Commissioners, and the Royal Drawing Society should confer with the committee of the Leighton House Fund as to the best measures to be taken in order to meet the conditions necessary before the generous offer made by Lord Leighton's sisters—to present his house with the unique Arabian Court and its gardens to the nation—can be accepted. Mr. Lionel Cust said that a collection of Lord Leighton's sketches already hanging on the walls of the house had been secured by the help of Mrs. Sutherland Orr, Mrs. Matthews, and some of his personal friends. The Prince of Wales had informed the committee that the scheme of securing Lord Leighton's house for the nation appealed very much to his sympathy, and he had authorised them to make public the fact that he "wished it every success and should be very glad to see the idea carried out." Resolutions were passed to the effect that it was most desirable that the offer of the sisters of the late Lord Leighton should be accepted, recommending that the house should be vested in some local corporate body for use as an art library and museum, and appointing a sub-committee to consider the matter and report to a subsequent meeting of delegates.

In the appeal for a further sum of £10,000 for continuing the mosaic decorations in St. Paul's Cathedral, Dean Gregory says:—"Through the liberality of four City companies the half domes at the corners of the great dome will be filled with mosaics, we hope before the end of the year. This and other work that is in progress will exhaust the funds at our disposal. We are very anxious to carry on what has been so well begun whilst we can have the invaluable help of Mr. Richmond. There are two things which press. The one is the space between the whispering gallery and the bottom of the windows in the dome. To cover this with mosaics will cost not less than £10,000. The other is to decorate the roof of the aisles of the choir, where there are six

small shallow domes, with a place for the arms of any donor who would kindly give £1,000 for the completion of one of them. We are anxious to make arrangements with Mr. Richmond, so that there may be no stoppage in the work. The money will not be wanted until next year, so that a promise, to be fulfilled next year, would suffice."

MANY and varied as have been the municipal enterprises of Glasgow in recent years, none has been more remarkable than the movement for extending the public parks and open spaces of the city. Until a few years ago it was very deficient in that respect, more especially for a town of such a large and dense population. Under Sir James Bell's régime, however, an immense development took place, and during the last six years the number of public parks of Glasgow have been more than doubled. Most of the additions have been made by purchase by the corporation, which has expended over £300,000 in this direction, so that the city now compares very favourably with other large towns, having over 1,000 acres of public recreation grounds. Hitherto it has been a common complaint that the corporation in this policy has favoured the well-to-do West-end and other suburbs, and neglected the toiling thousands of the industrial East-end. An important step in removing any ground for that reproach was taken on Saturday, when Lord Provost Richmond threw Tollcross Park open to the public. This, the latest addition to the city's property, consists of the grounds, extending to about 84 acres, surrounding the fine mansion of Tollcross, built by David Bryce, of Edinburgh, and long occupied by the Dunlop family.

THE twenty-eighth annual prize competition in turnery, under the auspices of the Turners' Company, will be held, and the exhibits displayed, at the Mansion House from October 27 to 29. The competition this year will be in wood-turning and in pottery, including terracotta, stoneware, earthenware, and porcelain. In each class the freedom of the company, with a monetary gift or silver medal, will be the first prize, and there will be other prizes given by the Baroness and Mr. Burdett-Coutts, Lord Amherst of Hackney, Sir Charles Hutton Gregory, Mr. Alfred Bevan, and others. The judges in wood will be Mr. Burdett-Coutts, M.P., Mr. A. Bevan, Mr. A. Murray (City surveyor), Mr. G. W. Budd, and Mr. G. W. Tayler; and in pottery, Mr. W. Brindley, Mr. W. Rome, Dr. A. Stuart Murray, and Colonel A. J. Copeland. The Lord Mayor will distribute the prizes on October 29.

CEMENT imbedded in an iron skeleton of wire, or what the French call "*cement arme*," an expanded-metal sort of construction, &c., such as we now use in floors and partitions, is very popular among some architects. We hear of the buildings erected by the Parisian Company at Denne-mont for the manufacture of cement has the beams and floors constructed of this *cement arme*, and also the hoppers bringing the clinkers to the mills are constructed of it, and other parts. These do service under very heavy loads. M. Edouard Candlot, the well-known French engineer and author, is the chief promoter of this French company which is developing the Portland cement industry.

FOR ordinary hotbeds and forcing-houses, such as are used by most market-gardeners, the Germans have, says *Kuhlow's German Trade Review*, a cheap substitute for glass in the so-called *fensterpappe*, which is a tough, strong Manilla paper that may be stretched on large sashes or frames, and saturated by painting the exposed surface with boiled linseed-oil until it becomes translucent and impervious to water. The paper costs, wholesale, in Germany, about 19s. 10d. per roll, 100 metres in length by 1 metre in width, equal to 1,220sq.ft. in each roll. There is no difficulty or secret about its preparation or use. Light wooden frames, about 40in. in width, and of any desired length, are provided, and covered with the paper, which is fastened by nailing at the edges, and then painted with ordinary boiled linseed-oil, until the paper is so saturated that the last coat of oil forms a smooth, glistening surface like varnish. As soon as dry, the frame is ready for use. It admits sufficient light for growing plants, does not require to be shaded in hot sunshine, is light, durable, secure against breakage by hail or ordinary accident, and, taking everything into account, is said to be about one hundred times cheaper than glass. It is largely used by florists and market-gardeners in the district of Frankfort, and their general

verdict is strongly in its favour, although for handsome conservatories, skylights, &c., it possesses less durability and none of the neatness and elegance of tectorium, which is a network of wire, covered on both sides by a tough, insoluble gum, said to be bichromated gelatin.

THE city of Brooklyn is to have an electric fountain, which will be erected in the Park plaza. Plans for the fountain were made by Mr. F. W. Darlington, Philadelphia, who has constructed fountains of a similar character in other cities. The circumference of the basin is 370ft., and it will be constructed of kosmocrete. Under the centre of the basin will be a cellar in which will be placed a large part of the scenery connected with producing the coloured effects. A tunnel will connect this cellar with an operating kiosk, where the person in charge of the fountain will stand, looking out of a window 6in. above the water. The electrical apparatus will consist of 19 automatic focussing arc lights, connected in series; each lamp will be of 6,000c.p., and will be provided with an adjustable stand which permits of throwing the light upon the ascending water. Three rheostats will be provided, one for each series of lamps, and each lamp will be provided with a silver parabolic reflector. The glass colour slides will be operated by compressed air, and they will be controlled by electricity. Eighteen incandescent lights will be arranged about the wall of the basin. The display of the fountain will consist of fancy jets, umbrella, ball sprays, rings, fans, funnels, wheat sheaves, &c., and an attempt will be made to throw pictures on a wide sheet of spray. The fountain is capable of throwing 100,000 gallons per hour. The contract price for the fountain is 24,500dol., and the contractors are the Willson and Baillie Manufacturing Company.

THE competition in joinery between the manufacturers in Sweden and Canada is, says the *Timber Trades Journal*, just now very keen. In consequence of the rise in the value of the raw material in Sweden, and the improvements in the method of manufacture in the colony, similar goods from both sources can be placed on the market here at identical prices. A close London buyer who was recently in the market for a line of 50,000 doors, has, we understand, closed with manufacturers of pine doors for the supply of 35,000, and placed the order for the remaining 15,000 with Swedish makers.

THE largest seismoscope in the world hangs through the centre of gravity in the obelisk 550ft. in height, erected at Washington, D.C., in honour of the first president of the United States. This instrument consists of a copper wire 174ft. long, which holds a plummet suspended from its lower extremity into a vessel of water. Two transits arranged at right angles to each other are focussed upon the wire just above the plummet, and by means of these little telescopes the slightest vibration of this great mass of stone is indicated upon a graduated scale. The expansion of the monument's south face, on a hot summer day, sometimes shifts the apex northward a few hundredths of an inch, and high winds frequently cause a slight variation from the normal position of the wire. Occasionally the plummet swings violently when the weather is calm and cool, its motion under such circumstances being ascribed to vibration of the earth itself. The custodian of the monument takes a daily statement of the transits and prepares a monthly chart of the same, which is filed in the War Department. An examination of these records discloses the interesting fact that no permanent change has been effected in the position of the monument, the plummet having always leaned towards its normal resting-place when the causes of disturbance subsided.

LORD KELVIN has consented to open the Shore-ditch Combined Electricity and Dust Destruction undertaking on Monday next, and the Chairman of the London County Council will preside at a commemorative dinner, to be held in the Shore-ditch Town Hall on the same evening, when the streets will be lighted from the works, which consist of destructor cells capable of burning 20,000 tons of ash-bin refuse per annum. The heat given off will be sufficient for providing electric light and power for the whole of Shore-ditch, with a population of 124,000 inhabitants, besides providing heat for the adjoining baths and washhouses, which will be a saving of £500 per annum in fuel. On the same site a public library and museum and technical institute are provided, the whole scheme costing



upwards of £200,000. This municipal enterprise is the first of its kind in the world, and promises to revolutionise the public supply of electricity, as the Shoreditch Vestry will supply the current during the day-time at 2d. per unit, and at night at 4d. per unit after the first two hours, for which 6d. will be charged. At the preliminary test 150lb. pressure of steam has been raised in the boilers from dust alone, without the use of any coal, and the results are already exceeding the most sanguine estimates.

The American Association of Portland Cement Manufacturers recently held a meeting in New York, and appointed a committee to go to Washington and protest against the proposed increase in the duty on cement. Under the present U.S. law the duty is 32 cents a barrel, and at that rate the Government collects nearly a million dollars a year from importations, while the States manufacturers, who can sell cement at a satisfactory profit at from 25 to 50 cents a barrel less than the cost of the imported cement, and who are gradually bringing their product to a very high standard, are quite contented with the existing conditions. Both Mr. Dingley's and Senator Aldrich's committees left the duty unchanged, but an amendment introduced by Senator Quay, and passed by the Senate, raises it to 44 cents a barrel.

A TESSELLATED Roman pavement has been discovered in the centre of Bath, south of the celebrated Roman baths, close by the abbey church on the site of the Weymouth House Schools now building, 10ft. below the surface. A length of about 6ft. has been laid bare, showing a handsome key border. The dimensions of the whole of it is impossible to estimate without excavation, as it extends under buildings adjoining the old town mansion of the Marquis of Bath. The committee who are building these church schools declare that they have not the funds either to excavate or to raise an archway for the preservation of this interesting relic. "Notwithstanding the valuable Roman antiquities discovered and excavated 'patrum nostrorum memoria' and preserved in the Bath Royal Literary and Scientific Institution, the *patres conscripti* of to-day, the municipal town councillors," says a correspondent, "encourage no archaeological researches, and only ridicule the antiquarian collections of Roman ware, gems, fibulae, paterae, amphorae, &c., and naturally object to throw on the ratepayers any expenses for this purpose."

The schools of Glen Tana, Aberdeenshire, erected by Sir William Cunliffe Brooks, Bart., are about to be given over to the School Board in commemoration of the Queen's Diamond Jubilee, and there is being built a drinking-fountain. The design is a filled-up arch, surmounted by an Imperial crown.

The commemoration stone of the Sunday-school and mission-hall in connection with St. Mary's Church, Bearwood, Smethwick, was laid on Friday. The church itself is comparatively new, and, as the district is rapidly extending, it became necessary to add to the possession of the church the necessary Sunday-school, mission-hall, and classrooms. These it is now proposed to erect adjoining the church. The plans provide for a building in the Early Gothic style of red brick, with Bath stone dressings and tile roof, to harmonise with the church. The principal portion will consist of a large schoolroom, 60ft. long by 30ft. wide. At the rear will be erected two classrooms, with space for 120 scholars. The total cost is estimated at about £1,700. Mr. J. H. Hawkes, Temple Row, is the architect, and Messrs. John Harley and Son, Smethwick, are the builders.

The new portion of St. Philip's Church, Dorridge, Knowle, was dedicated on Wednesday week. From designs by Mr. J. A. Chatwin, of Birmingham, a new chancel, built of stone, with chancel aisle, organ-chamber, and vestries has been erected. The new buildings have been joined to the old church. The ultimate intention is to substitute a stone nave, aisles, and tower for the present brick nave. The total cost of the completed edifice will be between £5,000 and £6,000.

On Sunday the memorial reredos recently erected in St. Thomas's Church, Seaforth, in commemoration of the Queen's Diamond Jubilee, was unveiled. The reredos has been erected at a cost of £300. The designer was Mr. C. E. Deacon, and the carvers were Messrs. Earp and Hobbs, of London. The reredos is composed of Derbyshire alabaster, and measures in height 13ft. by 9ft. 6in. in width. The centre position is occupied by a representation of the Crucifixion, and separated from this on each side by a wide panel are representations of Christ as the Good Shepherd and as the Light of the World.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Presentation of Royal Gold Medal to Mynheer P. J. H. Cuypers, of Amsterdam. 8 p.m.

## CHIPS.

In the case of Jonas Turner, Ascrington, timber merchant and contractor, the discharge has been suspended for two years, ending May 10, 1899.

Sir John T. Brunner, M.P., has intimated his intention of presenting a Guildhall to the town of Winsford, Cheshire.

Mr. E. M. G. Eddy, Chief Commissioner of Railways for New South Wales, died on Monday.

At Blackburn on Tuesday the dedication took place of a number of public playgrounds, and the mayor laid the first stone of the new Victoria Wing to the Blackburn and East Lancashire Infirmary.

On Saturday, July 24th, the members of the Society of Architects will visit Canterbury Cathedral, when the works of restoration now in progress will be inspected. Dean Farrar has promised, if possible, to address the Society.

Miss Brocklehurst, of The Bagstones, near Macclesfield, has promised to build a museum in Macclesfield West Park in commemoration of the Diamond Jubilee, and her brother, Mr. P. P. Brocklehurst, will endow it.

William Henry Farnfield, for 21 years clerk to the board of works for the Poplar district, died on the 16th inst at 146, High-street, Poplar, in his 60th year.

A new central block and corridor connections, comprising large dining-hall, kitchen, sitting-rooms, and 35 new bedrooms, with all modern appointments, are now being completed at the Sheringham Hotel, Norfolk, by Mr. George Riches, contractor, of Cromer. The whole of the building, including the decorations internally, have been carried out from the designs of the architects, Messrs. George J. and F. W. Skipper, of Norfolk.

The treasurers of St. George's Hospital have received from the executors of the late Mr. David Brandon, F.R.I.B.A., the sum of £10,000, being a payment on account of the residue of his estate, one-sixth share of which he had bequeathed to the hospital, in addition to a specific bequest of £3,000 already received.

On Tuesday, June 15, the Bishop of Southwark laid the foundation-stone of the new Church of our Lady and St. Peter, about to be erected, through the munificence of Sir Elward and Lady Blount, from the designs of Mr. Frederick A. Walters, F.S.A., of Westminster. The church will be in Norman style, and will consist of nave, processional aisle, chancel, two side chapels and sacristies, together with a large and massive tower. Accommodation will be provided for between three and four hundred persons.

A special meeting of the town council of Wisbech was held on Thursday in last week to unveil and to receive the presentation of a drinking fountain in the Old Market in memory of the late Mr. and Mrs. G. D. Collins, of Wisbech. The foundation is in the Renaissance style, of red Mansfield stone, with Sicilian marble vase trough, and inscription on the panels. There is also a quotation from "Timon of Athens": "Honest water, which ne'er left man i' the mire." Besides the drinking cup there are troughs for horses, sheep, and dogs. The memorial has been designed and executed by Mr. Henry Hugh Armistead, R.A.

A special meeting of the Burton-on-Trent Town Council was held on the 17th inst. to receive the reports of the sub-committee appointed to inquire into the selection of a borough surveyor, in place of Mr. J. E. Swindlehurst, who is now at Coventry. The selected candidates were Mr. Harrison (Newport, Mon.), Mr. Fynam (Aberdeen), Mr. Lancashire (Sheffield), and Mr. Campbell (Canterbury); while Mr. Miller, assistant borough surveyor of Burton, was also scheduled. Mr. Fynam was chosen unanimously.

On Wednesday week the solemn opening took place of the new chancel of the Church of the English Martyrs, Streatham, S.W. The architect is Mr. Purdie. The cost of the new chancel is estimated at about £5,000, and is the gift of Mr. Measures. The tabernacle door, vestments, a carpet, and other requisites for the sanctuary, are special gifts from other benefactors.

A company is about to be formed for the construction of a canal to unite the Sea of Japan to the Pacific Ocean. The canal, which is to have a breadth of 26ft. 8in. will commence at Tauraga, on the Sea of Japan, and terminate in the Bay of Curawan, on Lake Biwak. From Curawan, a second canal will be formed to Usikawa, at the mouth of which Osaka is situated. The first section of the canal would be 22 miles, and its estimated cost is £309,600. The second section would be 90 miles in length, and its cost is estimated at £253,000.

## LATEST PRICES.

### IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 15 0 to	£6 0 0
Rolled-Steel Joists, English.....	6 11 0 "	6 11 0 "
Wrought-Iron Girder Plates.....	5 15 0 "	6 10 0 "
Bar Iron, good Staffs.....	7 0 0 "	8 0 0 "
Do., Lowmoor, Flat, Round, or Square.....	17 0 0 "	17 0 0 "
Do., Welsh.....	5 15 0 "	5 17 0 "
Boiler Plates, Iron—		
South Staffs.....	7 17 0 "	8 5 0 "
Best Suedeshill.....	10 0 0 "	10 10 0 "
Angles 10s., Tees 20s. per ton extra.		

Builders' Hoop Iron, for bonding, &c., £6 15s. 0d. per ton.  
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.  
Galvanised Corrugated Sheet Iron—

8ft. to 8ft. long, inclusive gauge.....	No. 18 to 20. Per ton.	No. 22 to 24. Per ton.
Best ditto.....	£10 15 0 "	£11 0 0 "
	11 5 0 "	11 10 0 "

	Per ton.	Per ton.
Cast-Iron Columns.....	£8 0 0 to	£8 10 0
Cast-Iron Stanchions.....	6 0 0 "	8 10 0
Cast-Iron Sash Weights.....	—	4 2 6
Cast-Iron Socket Pipes—		
3in. diameter.....	5 10 0 "	5 15 0
4in. to 6in.....	5 5 0 "	5 10 0
7in. to 24in. (all sizes).....	4 15 0 "	5 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall.....	105s. to 110s.
Hot Blast, ditto.....	77s. 6d. to 82s. 6d.

Wrought-Iron Tubes—Discount off Standard Lists f.o.b. Ga.—Tubes..... 75p.c. Fittings 77p.c.

	Per ton.	Per ton.
Water-Tubes.....	70 "	72 1/2
Steam Tubes.....	62 1/2 "	65
Galvanised Gas-Tubes.....	60 "	62 1/2
Galvanised Water-Tubes.....	65 "	67 1/2
Galvanised Steam-Tubes.....	45 "	47 1/2

Sheet Zinc, for roofing and working up.....	Per ton.	Per ton.
	£22 10 0 to	£23 15 0

Sheet Lead, 3lb. per sq. ft. super.....	14 0 0 "	15 0 0
Pig Lead, in cwt. pigs.....	13 10 0 "	14 10 0
Lead Sheet, in 28lb. bags.....	16 10 0 "	17 10 0
Copper Sheets, sheathing and rods.....	60 10 0 "	61 0 0
Copper, British Cake and Ingots.....	51 15 0 "	52 15 0
Tin, Straits.....	62 7 6 "	63 7 6
Do., English Ingots.....	64 0 0 "	64 15 0
Spelter, Silesian.....	17 10 0 "	18 0 0

Cut Clasp Nails, 3in. to 6in.....	Per ton.	Per ton.
	£9 15 0 to	£9 15 0
Cut Floor Brads.....	8 10 0 "	9 10 0

Wire Nails (Points de Paris)—	Per ton.
0 to 7 8 9 10 11 12 13 14 15 B.W.G.	
8/6 9/0 9/6 10/3 11/0 12/0 13/0 14/3 16/9 per cwt.	

### TIMBER.

Teak, Burmah.....per load	£14 0 0 to	£16 10 0
" Bangkok.....	11 10 0 "	15 10 0
Quebec pine, pitch.....	—	—
" yellow.....	1 15 0 "	3 15 0
" Oak.....	5 5 0 "	6 5 0
" Birch.....	3 15 0 "	5 10 0
" Elm.....	4 0 0 "	5 5 0
" Ash.....	3 5 0 "	4 10 0
Dantisc and Memel Oak.....	2 10 0 "	3 10 0
" Fir.....	2 15 0 "	4 15 0
Wainscot, Riga p. log.....	2 0 0 "	4 5 0
Lath, Dantisc, p.f.....	4 10 0 "	5 10 0
St. Petersburg.....	5 0 0 "	6 10 0
Greenheart.....	8 0 0 "	9 0 0
Box.....	4 0 0 "	15 0 0
Sequoia, U.S.A., per cube foot.....	0 1 9 "	0 1 10
Mahogany, Cuba, per super foot.....	—	—
Lin. thick.....	0 0 4 1/2 "	0 0 6 1/2
" Honduras.....	0 0 5 1/2 "	0 0 6 1/2
" Mexican.....	0 0 4 1/2 "	0 0 5 1/2
Cedar, Cuba.....	0 0 4 1/2 "	0 0 5 1/2
" Honduras.....	0 0 4 1/2 "	0 0 5 1/2
Satinwood.....	0 0 7 1/2 "	0 1 0 1/2
Walnut, Italian.....	0 0 3 1/2 "	0 0 7 1/2
Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2in. by 1 1/2in.—		

Quebec, Pine, 1st.....	£19 10 0 to	£25 10 0
" 2nd.....	14 0 0 "	16 10 0
" 3rd.....	6 10 0 "	10 0 0
Canada Spruce, 1st.....	10 10 0 "	12 0 0
" 2nd and 3rd.....	8 0 0 "	9 5 0
New Brunswick.....	7 15 0 "	8 5 0
Riga.....	7 10 0 "	8 10 0
St. Petersburg.....	9 10 0 "	13 10 0
Swedish.....	9 10 0 "	16 10 0
Finland.....	9 0 0 "	9 10 0
White Sea.....	10 10 0 "	17 0 0
Battens, all sorts.....	5 0 0 "	20 0 0

Flooring Boards, per square of lin.—		
1st prepared.....	0 8 6 "	0 15 6
2nd ditto.....	0 7 0 "	0 12 0
Other qualities.....	0 5 3 "	0 6 9

Staves, per standard M.—		
Quebec pipe.....	—	—
U.S. ditto.....	35 0 0 "	42 10 0
Memel, cr. pipe.....	230 0 0 "	240 0 0
Memel, brack.....	200 0 0 "	210 0 0

### OILS.

Linseed.....per ton	£14 5 0 to	£14 10 0
Rapeseed, English pale.....	26 15 0 "	27 10 0
Do., brown.....	23 10 0 "	25 10 0
Cottonseed, refined.....	14 10 0 "	15 0 0
Olive, Spanish.....	29 0 0 "	35 15 0
Seal, pale.....	23 0 0 "	24 0 0
Cocanut, Cochin.....	26 0 0 "	27 0 0
Do., Ceylon.....	23 5 0 "	23 10 0
Palm, Lagos.....	20 15 0 "	22 10 0
Oleine.....	19 0 0 "	20 0 0
Lubricating U.S.....per gal.	0 6 8 "	0 7 6
Petroleum, refined.....	0 0 4 1/2 "	0 0 4 1/2
Tar, Stockholm.....per barrel	1 2 0 "	1 5 0
Archangel.....	0 12 6 "	0 15 0
Turpentine, American.....per ton	21 0 0 "	21 10 0















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